

KNOWLEDGE, ATTITUDE AND UTILIZATION OF HIV POST-EXPOSURE PROPHYLAXIS AMONG HEALTH CARE WORKERS AT HIV TREATMENT CENTERS IN PORT-HARCOURT METROPOLIS

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ABSTRACT

Background: Human Immunodeficiency Virus (HIV) is one of the world's top causes of death. New HIV infections emerge every day, leading HIV patients to seek care at health facilities and prompting health care professionals to undertake risky invasive procedures. And notwithstanding the mediation of science, this poses a risk of occupational exposure among health care workers (HCWs), hence the need for the effective use of HIV post-exposure prophylaxis (PEP). The aim of this study was to assess the knowledge, attitude and utilization of PEP among health care workers at HIV treatment centers in Port-Harcourt metropolis.

Methodology: This descriptive cross-sectional study utilized a pre-tested, structured, self-administered questionnaire on a sample of 204 HCWs chosen by multi-stage sampling method. Data were analyzed and presented using descriptive and analytical statistics.

Result: The study revealed that 39.7% of the respondents had good knowledge of HIV PEP and 96.5% had good attitude towards HIV PEP. Additionally, 22.1% had previously encountered possible occupational exposure to HIV, and only 45.5% of them took PEP. This translates to an overall PEP use of 10.1%. Significant associations were observed between knowledge and attitude towards PEP ($p < 0.001$), source of information and knowledge ($p < 0.001$), and source of information and attitude ($p = 0.02$). The study also showed that sex, marital status and designation was associated with utilization of PEP ($p = 0.01$; $p = 0.04$; $p = 0.02$).

Conclusion: The study revealed low utilization of PEP despite the level of good and fair knowledge and a generally positive attitude towards PEP. There exists a gap between knowledge and utilization of PEP, hence the need for periodical retraining of HCWs. This should be supplemented by ensuring the consistent availability and accessibility of PEP at treatment centers.

Key words: HIV, PEP, knowledge, attitude and practice.

INTRODUCTION

Since the onset of the HIV scourge, about 35 million individuals have lost their lives to HIV and HIV related causes and 36.9 million are still living with the virus as at the end of the year 2017¹. Various strategies have been implemented to prevent and control the spread of the infection, which occurs predominantly through sexual transmission but also to a lesser extent through unsafe medical care. Naturally, it requires 2 -3 days from exposure for the virus to be detected in lymph nodes². This offers a short window of opportunity during which HIV acquisition following exposure can be averted by using PEP. PEP is a short-term medical response or treatment that reduces the probability of a virus establishing an infection after potential exposure³. In the case of HIV, it involves the administration of a 28-day course of ARV drugs within 72 hours of possible exposure to HIV to prevent infection. It is administered alongside HIV testing and counseling, and is recommended for both occupational and non-occupational exposures^{2,3,4}.

HCWs constitute the chunk of individuals that aid each nation in the fight against HIV as their job demands an active caring role, which brings them in close contact with body fluids and blood of infected patients. This puts them at higher risk of the occupational exposure to HIV and other infections. According to the World Health Organization (WHO) 2.5% of the total HIV global cases are due to occupational exposure among HCWs and every year there are approximately 3 million percutaneous exposures among HCWs worldwide. These exposures are estimated to result in 200 to 5000 HIV infections⁵. As HIV infection continues to rise, the demand for healthcare services by HIV infected individuals increases subsequently, posing an increased risk of occupational exposure for HCWs. This therefore puts them at risk of contracting the infection due to their occupation. Unfortunately, HCWs have been found to be negligent as far as their own health is concerned despite being exposed to high risk of contracting various infections and the risk of also becoming victims of lifestyle diseases. Studies have revealed that there is a low uptake of HIV screening, poor access to HIV care and poor knowledge regarding HIV PEP among HCWs^{6,7,8,9,10}. In light of the occupational risk of exposure to HIV, it is important for HCWs to have adequate knowledge on PEP for HIV to protect themselves during the course of their career, as unsafe injection practices carry both socio-economic and psychological blowbacks on the health care worker and the health system at large¹¹. This study done was to assess the knowledge, attitude and utilization of PEP among HCWs at HIV treatment centers in Port-Harcourt metropolis.

MATERIALS AND METHOD

Study Area

The study was conducted in Port Harcourt metropolis which consists of Obio/Akpor Local Government Area and Port Harcourt City Local Government Area. It was carried out at private, primary, secondary and tertiary health institutions. The sites offer comprehensive HIV services that include HIV counselling and testing, TB treatment services, HIV care and support etc. some of the primary health care centers go further to provide partner notification services, client tracking and follow up. The sites are supported by

the Family Health International 360 (FHI 360) in conjunction with the State Agency for the Control of AIDS (SACA) which is an arm of the Ministry of Health. Consequently, the sites report to the Ministry of Health.

Study Design & Sample Size Determination

A descriptive cross-sectional design was employed for this study. The study population comprises health care providers (Doctors, Nurses and Laboratory scientists) of both genders, at Hospitals with HIV treatment centers located within the premises, in Port Harcourt metropolis. The criteria for inclusion of participants were that participant must be a health care provider at the selected HIV treatment facility and must have worked at the facility for at least one year. As an exclusion criterion, health care providers at selected facilities that were on leave, those that are not directly involved in HIV management and are not at risk of occupational exposure to HIV, health care provider without a formal medical training/qualification and HIV treatment facilities with less than 5 staffs were not selected to participate in this study.

The sample size for this study was determined using the formula¹²:

$$n = \frac{Z^2 pq}{d^2}$$

n = sample size

p = estimated percentage of the attribute that is present in the population; 86.0% knowledge¹³.

q = 1 - p Z= level of significance at 95% = 1.96

d = margin of sampling error tolerated at 95% degree of confidence =5% =0.05

$$n = \frac{1.96^2 \times 0.860 \times (1 - 0.860)}{0.05^2} = \frac{1.96^2 \times 0.860 \times 0.140}{0.0025} = 185.01$$

n = 185 persons

Adjusting for non- response rate of 10%

$$10\% \text{ non-response} = 10/100 \times 185 = 18.5$$

$$\text{Adjusted sample size} = 18.5 + 185 = 203.5$$

Working sample size = 204 health care workers

Sampling Method

A multi-stage sampling method was employed for this study to select a representative sample. This process was carried out in 4 stages. First, treatment centers were identified from the list of FHI 360/SACA supported HIV treatment facilities in Rivers state, which contained 122 treatment centers. A total of 78 treatment centers were identified to be located within Obio-Akpor LGA and Port-Harcourt LGA. The 78 treatment centers consisted of 2 tertiary hospitals, 44 private hospitals, and 32 primary health care centers. Second, the simple random sampling method of balloting was used to select 1 tertiary hospital, 2 private hospitals, and 13 primary healthcare facilities that was incorporated into the study. Third, proportionate allocation of the sample to each of the selected facility based on the number of healthcare workers at each of the centers was done. Lastly, health care workers from the selected facilities were selected by simple random sampling method of balloting to participate in the study.

Study Instruments

A 33 item, structured, self-administered questionnaire adapted from previous studies^{10,14-16} was used to obtain the needed information from the respondents. Prior to data collection, a pre-test of the questionnaire was conducted on a sample of 20 (10% of study sample) health care providers who worked at Non- governmental organization in Eleme LGA that catered to HIV positive individuals within the area. This was used to validate and uncover possible problems that might be associated with the questionnaire and data collection procedure. The questionnaire consisted of the following sections: Section A contained 7 questions (questions 1-7) that collected socio-demographic information. Section B contained 9 questions (questions 8-16). Eight of the 9 questions assessed the respondents' knowledge of HIV PEP while 1 took data on source of knowledge. Section C contained 8 questions (questions 17-24), with options rated on a 5-point Likert scale, to assess attitude towards PEP. Section D contained 9 questions that describe the respondents' use of PEP after possible exposure (utilization). Six of the 9 questions were used to measure to score the respondents utilization, while the other 3 elicited information on the reasons that influenced the respondents' utilization.

For the assessment of knowledge, a score of 1 was assigned to each correctly answered question and a total score of ≤ 3 , 4-5, and 6-8 was considered as poor knowledge, Fair knowledge and Good knowledge respectively. For the assessment of attitude, the 5-point Likert scale was scaled down to a 3-point scale; i.e. "strongly agree" and "agree" were regarded as the same and given a score of 3, "Not sure" was given a score of 2, while "strongly disagree" and "disagree" were regarded as the same and given a score of 1. **Total scores of <18 and ≥ 18 was considered as Poor attitude and Good attitude respectively.** For the assessment of utilization, a score of 1 was assigned to each correctly answered question and a total score of ≤ 3 and 4-6 was considered as Poor utilization and Good utilization respectively.

Data Management

Data collected was extracted from the questionnaire, coded and entered into Microsoft Excel 2016, and then exported to Statistical Package for Social Sciences (SPSS version 22). Categorical data were presented in the form of frequencies and percentages and the summary statistics in means and standard deviation and the results were presented in tables. Chi-square test was used to test for differences in proportion and level of significance was determined. Risk association between variables was determined and reported in 95% confidence interval.

RESULTS

A total of 204 questionnaires were distributed. However, after data cleaning and removal of questionnaires with uncompleted responses for key variables, 199 questionnaires were deemed suitable for analysis. This gave a completeness rate of 97.6%. The results of the analysis are presented hereunder.

Table 1: Socio-demographic characteristics of the respondents

Characteristics	Frequency n=199	Percentage (%)
Age		
20-29	55	27.6
30-39	81	40.7
40-49	45	22.6
50-59	18	9.1
Mean=35.7 ± 8.2 years		
Sex		
Male	70	35.2
Female	129	64.8
Marital Status		
Married	122	61.3
Single	77	38.7
Highest level of education		
Bachelors	162	81.4
Post-graduate	37	18.6
Designation		
Nurse	97	48.7
Lab Scientist/Technologist	41	20.6
Doctor	40	20.1
Community Health Officer	21	10.1
Work Experience		
1-3 years	49	24.6
4-6 years	55	27.6
7-9 years	20	10.1
≥ 10 years	75	37.7
Mean=9.0 ±7.2years		

Table 1 shows that 27.6% of the respondents were between 20-29 years of age, 40.7% were between 30 - 39 years, while 22.6% were between 40 - 49 years and 9.1% were between 50 - 59 years with a mean age of 35.72 ± 8.17 years. The sex distribution was 35.2% for males and 64.8% for females. The table also reveals that majority (61.3%) of the respondents were married while 38.7% were single.

Table 2a: Knowledge of HIV Post-Exposure Prophylaxis

Characteristics	Frequency(n=199)	Percentage (%)
Have you heard of PEP		
Yes	196	98.5
No	3	1.5
Source of Information (n=196)		
Training	141	71.9
Colleague	20	10.2

Textbooks	14	7.1
Media	12	6.1
Journals	9	4.6
which is the WHO recommended HIV PEP drug regimen		
1 drug regimen	82	41.2
2 drug regimen	41	20.6
3 drug regimen	60	30.2
Didn't know	16	8.0
When do you think PEP should be indicated		
Patient is known HIV +	89	44.7
For any needle stick injury	62	31.2
Source patient at high risk	31	15.6
Patient HIV status is unknown	17	8.5
What is the maximum time allowed before initiating PEP		
12 Hours	9	4.5
24 Hours	87	43.7
48 hours	17	8.5
72 Hours	83	41.7
Didn't know	3	1.5
How effective is PEP		
100%	88	44.2
80-99%	85	42.7
60-70%	19	9.6
30-50%	2	1.0
Didn't know%	5	2.5
For how long does someone have to take PEP		
28 days	151	75.9
40 days	13	6.5
3 Months	16	8.0
6 months	5	2.5
For life time	2	1.0
Didn't Know	12	6.0
Is there a National PEP Guideline		
Yes	178	89.5
No	17	8.5
Didn't Know	4	2.0
HIV PEP protects against sexually transmitted infections other than HIV		
Yes	14	7.0
No	183	92.0
Didn't Know	2	1.0

Table 2b: Attitude towards HIV post-exposure prophylaxis.

Characteristics	Frequency (n=199)	Percentage (%)
PEP is important		
Agree	193	97.0
Not Sure	4	2.0

Disagree	2	1.0
PEP training for medical personnel are important for behavioral change		
Agree	181	91.0
Not Sure	15	7.5
Disagree	3	1.5
There should be PEP guideline at treatment facilities		
Agree	187	94.0
Not Sure	12	6.0
I believe PEP reduces likelihood of being HIV positive		
Agree	185	93.0
Not Sure	11	5.5
Disagree	3	1.5
PEP should be made available in this facility		
Agree	182	91.5
Not Sure	15	7.5
Disagree	2	1.0
PEP should be indicated for any type of sharp injuries		
Agree	82	41.2
Not Sure	59	29.6
Disagree	58	29.1
I believe PEP is not necessary if the exposure doesn't involve patient blood of known HIV positive		
Agree	126	63.3
Not Sure	23	11.6
Disagree	50	25.1
I would willingly take PEP after an exposure if it were available		
Agree	146	73.4
Not Sure	44	22.1
Disagree	9	4.5

Table 2c: Utilization of HIV Post-Exposure Prophylaxis.

Characteristics	Frequency (n=199)	Percentage (%)
Have you ever had a possible occupational HIV exposure		
Yes	44	22.1
No	145	72.9
Can't remember	10	5.0

If yes, did you take PEP after the exposure (n=44)		
Yes	20	45.5
No	24	54.5
If yes, the reason closest to why you took PEP (n=20)		
Availability	8	40.0
Necessity	6	30.0
Perceived fear	5	25.0
Persuasion	1	5.0
If no, the reason closest to why you didn't take PEP(n=24)		
Side effects/Toxicity	12	50.0
Lack of information	4	16.7
Pill burden	3	12.5
Unavailability	2	8.3
History of poor adherence	1	4.2
Others	2	8.3
How soon after the exposure did you start taking the PEP (n=20)		
Within 1- 24 hours	8	40.0
Within 24 -72 hours	8	40.0
After 72 hours	2	10.0
After 84 hours	2	10.0
How long did you take PEP for (n=20)		
3 days	6	30.0
15 days	2	10.0
28 days	8	40.0
3 months	4	20.0
Did you complete the prescribed dosage (n=20)		
Yes	14	70.0
No	6	30.0
If No, what is the closest reason for discontinuation of the drug (n=6)		
Side effects	4	66.7
Complications	2	33.3
Did you perform a follow up test after you completed the dosage (n=20)		
Yes	11	55.0
No	9	45.0

Table 3: Scoring of Knowledge, Attitude of Utilization of HIV Post-Exposure Prophylaxis

Characteristics	Frequency n=199	Percentage (%)
Knowledge scoring		
Poor Knowledge (≤ 3)	14	7.0
Fair Knowledge (4 - 5)	106	53.3
Good Knowledge (6 - 8)	79	39.7
Attitudinal scoring		
Poor Attitude (<18)	7	3.5
Good Attitude (≥ 18)	192	96.5
Utilization score		
Poor Utilization (≤ 3)	32	72.7
Good Utilization (4-6)	12	27.3

Table 3 shows that 39.7% of the respondents had Good knowledge regarding HIV PEP, 96.5% that had good attitude and 27.3% of respondents who have had possible exposures showed correct use of HIV PEP.

Table 4: Relationship between socio-demographic and knowledge of HIV post-exposure prophylaxis among respondents

Socio-demographic	Knowledge			Total	df	X ² (p-value)
	Good Knowledge(6-8)	Fair Knowledge (4-5)	Poor Knowledge(≤ 3)			
Designation						
Community Health Officer	12 (57.1)	8 (38.1)	1 (4.8)	21 (100.0)	6	41.21 (0.001)*
Doctor	31 (77.5)	8 (20.0)	1 (2.5)	40 (100.0)		
Lab Scientist	12 (29.3)	23 (56.1)	6 (14.6)	41 (100.0)		
Nurse	24 (24.7)	67 (69.1)	6 (6.2)	97 (100.0)		
Total	79(39.7)	106(53.3)	14(7.0)	199(100.0)		

Table 4 shows that there is a statistically significant relationship between the respondents' designation and knowledge of PEP. A statistically significant higher proportion for good knowledge of HIV PEP was found amongst doctors, compared to other designations ($p=0.001$).

Table 5: Relationship between knowledge and attitude towards HIV post-exposure prophylaxis among respondents

Characteristics	Attitude towards PEP		Total	df	X ² (p-value)	OR (95% CI)
	Poor Attitude(<18)	Good Attitude (≥18)				
Knowledge						
Poor knowledge (≤3)	7 (50.0)	7 (50.0)	14 (100.0)	2	37.3 (0.001)*	na
Fair knowledge (4-5)	0 (0.0)	106 (100.0)	106 (100.0)			
Good knowledge (6-8)	0 (0.0)	79 (100.0)	79 (100.0)			
Total	7 (3.5)	192 (96.5)	199 (100.0)			

Table 5 shows that there is a statistically significant relationship between the respondents' knowledge score and attitude towards PEP. Respondents with fair knowledge and good knowledge have a statistically higher proportion for good attitude compared to those with poor knowledge ($p=0.001$).

Table 6: Relationship between socio-demographics and utilization of HIV post-exposure prophylaxis among respondents

Socio-demographic	Utilization		Total	df	X ² (p-value)	OR (95% CI)
	Poor Utilization (≤3)	Good Utilization (4-6)				
Sex						
Male	11 (52.4)	10 (47.6)	21 (100.0)	1	6.54 (0.01)*	1.05 (0.19-5.65)
Female	21 (91.3)	2 (8.7)	23 (100.0)			
Total	32 (72.7)	12 (27.3)	44 (100.0)			
Marital Status						
Single	18 (90.0)	2 (10.0)	20 (100.0)	1	4.03 (0.04)*	1.56 (0.29-8.27)
Married	14 (58.3)	10 (41.7)	24 (100.0)			
Total	32 (72.7)	12 (27.3)	44 (100.0)			
Designation						
Community Health Officer	2 (33.3)	4 (66.7)	6 (100.0)	3	12.01 (0.02)*	Na
Doctor	4 (44.4)	5 (55.6)	9 (100.0)			
Lab Scientist	5 (83.3)	1 (16.7)	6 (100.0)			
Nurse	21 (91.3)	2 (8.7)	23 (100.0)			
Total	32 (72.7)	12 (27.3)	44 (100.0)			

*= statistically significant

Table 6 shows that there is a statistically significant relationship between the respondents' sex, marital status and designation and utilization of PEP. A statistically significant higher proportion for good utilization of HIV PEP was found amongst males compared to females (p=0.01, OR: 1.05, CI: 0.19 – 5.65). Additionally, a higher proportion of good utilization was observed among respondents who were married compared to those who were single (p=0.04, (OR: 1.56, CI: 0.29 – 8.27). Additionally, a statistically significant higher proportion for good utilization of HIV PEP was found amongst community health officers compared to other designations(p=0.02).

Table 7: Relationship between source of information and respondents' knowledge and attitude towards HIVPEP

Source of Information	Knowledge			Total	df	X2 (p-value)
	Good Knowledge (6-8)	Fair Knowledge (4-5)	Poor Knowledge (≤ 3)			
Colleague	4 (20.0)	12 (60.0)	4 (20.0)	20 (100.0)	8	34.2 (0.001) *
Journals	8 (88.9)	1 (11.1)	0 (0.4)	9 (100.0)		
Media	0 (0.0)	8 (66.7)	4 (33.3)	12 (100.0)		
Textbooks	9 (64.3)	5 (35.7)	0 (0.0)	14 (100.0)		
Training	58 (41.1)	78 (55.3)	5 (3.5)	141 (100.0)		
Total	79 (40.3)	104 (53.1)	13(6.6)	196 (100.0)		
Attitude						
	Good Attitude (≥18)		Poor Attitude (<18)			
Colleague	17 (85.0)		3 (15.0)		20 (100.0)	4 (0.02) *
Journals	9 (100.0)		0 (0.0)		9 (100.0)	
Media	10 (83.3)		2 (16.7)		12(100.0)	
Textbook	14 (100.0)		0 (0.0)		14 (100.0)	
Training	140 (99.3)		1 (0.7)		141 (100.0)	
Total	190(96.9)		6(3.1)		196(100.0)	

*= statistically significant

Table 7 shows that there was a statistically significant association between source of information and the respondents' knowledge and attitude towards HIV PEP. Respondents who had attended a training on PEP had a significant proportion for good knowledge, followed by respondents whose source of information was textbooks(p=0.001). Respondents who had attended a training on PEP had a significant proportion for good attitude, followed by respondents whose source of information were their colleague(p=0.02).

DISCUSSION

This study found that 39.7% had good knowledge regarding HIV post exposure prophylaxis, though 98.5% had heard of PEP. Additionally, a larger proportion of the respondents (53.3%) had fair knowledge of HIV PEP. This study's finding is also similar to findings from studies carried out in Benin City, Nigeria¹⁴. The proportion of respondents that knew the recommended PEP drug regimen in this study (30.2%) corroborates with the study done in Cameroun⁸. The high proportion of respondents that knew the correct duration of treatment is similar to that reported in the study conducted in Lagos¹⁷ and Abuja¹⁸. However, the level of good knowledge reported in this study (39.7%) is less than that reported in a study conducted in North West Ethiopia¹⁵. The proportion of the respondents that had good knowledge of PEP, as reported by this study, is also much lower than that reported in a study at Enugu state (86.0%)¹³ and Benin (66.0%)¹⁹.

On attitude towards HIV PEP, this study found that majority of the respondents showed good attitude towards HIV PEP. A reasonable proportion of the respondents agreed that PEP for HIV was important, PEP training for medical personnel was important for behavioral change, PEP guidelines should be made available at facilities, PEP reduces the likelihood of being HIV positive, and that PEP should be made available at their respective facilities. The proportion of respondents with good attitude towards HIV PEP as observed by this study was higher than that of a study conducted in North West Ethiopia¹⁵, and Benin, Nigeria¹⁴. On the other hand, the proportion of respondents with good attitude is in accord with that recorded in a Zimbabwean study²⁰. However, the findings from this study corroborate with findings from another descriptive cross-sectional study in Enugu State, Nigeria¹³. This study also revealed that over one-third of the respondents agreed to willingly take PEP following an exposure. This finding is similar to findings from a study at Benin City, Nigeria¹⁹.

On utilization of HIV PEP following exposure, this study revealed generally poor level of PEP utilization, as very few of the respondents that had possibly been previously exposed to HIV took HIV PEP. The proportion of exposed respondents is much less than the proportion of exposed respondents in a study conducted in Zimbabwe²⁰, North West Ethiopia¹⁵ and Cameroun⁸. Although, the level of utilization of PEP found in this study was higher than the proportion of those who utilized PEP in the same study⁸. Another study conducted in Dares Salaam, Tanzania, revealed a higher prevalence of possible occupational exposure to HIV, but a similar level of utilization following the exposure²¹. The level of PEP utilization as

reported in this study is higher than that reported in a study conducted at Lagos, Nigeria¹⁷. In comparison with a descriptive cross-sectional study conducted at Enugu State¹³, this study recorded very similar level of HIV PEP utilization.

This study found a statistically significant association between the source of PEP knowledge and the respondents' knowledge of HIV. This finding is similar to findings from a study conducted in Cameroun⁸. This study also revealed a significant association between job designation and knowledge of PEP, and the respondents' knowledge score and attitude towards PEP. These findings are in accordance with findings from a similar study conducted at Ethiopia²². This study observed no statistically significant association between respondents' knowledge and practice of PEP, and respondents' attitude and practice of PEP. This finding is similar to that recorded by a study conducted in Ethiopia²³.

The differences between the level of adequate knowledge, attitude & utilization reported in this study and that reported by other studies may be owing to the difference in demographics of the study population, the method of sampling that was employed in each of these studies, the study instrument that was used in each of the studies and how the data extracted from the study instrument was analyzed. Some of the studies utilized a study instrument that was adapted from the US public health service guidelines for the management of occupational exposure to HIV and recommendation for post-exposure prophylaxis, while the questionnaire used in this study was adapted from a different, pre-validated questionnaire from a published article.

Nevertheless, the implication of these findings can be explained by the compounding effect that knowledge has on the already existing risk posed by needle stick injuries. As majority of the respondents had good attitude, but fair knowledge, the application of health education will prove effective in bridging the existing knowledge gap. It is unclear if the trainings that were attended by the respondents gave an in-depth treatment of the subject matter, or if HIV PEP only was mentioned in passing. Trainings with emphasis on HIV PEP will prove effective in addressing the observed gap in knowledge, improving attitude towards PEP and promote its utilization in the case of an exposure. In subsequent years after such trainings have been carried out, further research can be done in the same study area and the findings compared with that observed in this study, noting if there would be an improvement in the level of HIV PEP knowledge among HCWs in the state, and a more positive attitude towards HIV PEP.

CONCLUSION

Though majority of the respondents had heard about PEP, only few had good knowledge and utilized PEP correctly. It was also found that majority of the respondents heard about PEP via a training, and that in light of these trainings, only few knew the WHO recommended drug regimen for PEP. The level of PEP utilization was poor and the side effects of the drug was the major reason for not taking PEP. Based on these findings, the need for stakeholders & policy makers to prioritize the scaling-up of HIV PEP uptake at HIV treatment centers and availability of less toxic drugs for use as PEP. Such efforts should be complemented by ensuring the continual availability of PEP at the facilities. There is also need for enhanced reporting of needle stick injuries, to enable efficient tracking and follow up of these cases by the government. The establishment of a training center to oversee periodical trainings and re-trainings of existing health care workers on safety measures in the hospital setting, with emphasis on post exposure prophylaxis, and all-round access to post exposure prophylaxis care and support, both at nights, weekends and holidays is highly recommended.

Ethical Considerations

Ethical clearance for the study was sought and obtained from the Research and Ethics Committee of the University of Port Harcourt. Permission was sought from the Head of Department of Internal Medicine, University of Port Harcourt Teaching Hospital. Permission was sought from the Rivers State Primary Health Care Management Board to gain access to the primary health centers that are under its jurisdiction.

Consent: A consent form which provided options to participate or decline was attached to the questionnaire that was administered to the study participants.

LIMITATIONS

A limitation for this study is that information was self-reported by study participants. This limited the study because participants may or may not have truthfully report their answers to the questions and may have been biased in the answers as participants may have provided responses they felt was desired by the researcher. Another limitation is that the study participants may or may not be representative of the HCWs in Port-Harcourt metropolis as the study sites were sampled from a list of FHI 360/SACA supported facilities which in turn may or may not have included all the facilities in the Port-Harcourt metropolis.

REFERENCES

1. Joint United Nations Programme on HIV/AIDS. UNAIDS data 2017. UNAIDS: Geneva, Switzerland. 2017.
2. Cresswell F, Waters L, Briggs E, Fox J, Harbottle J, Hawkins D, Murchie M, Radcliffe K, Rafferty P, Rodger A, Fisher M. UK guideline for the use of HIV post-exposure prophylaxis following sexual exposure, 2015. *International journal of STD & AIDS*. 2016 Aug;27(9):713-38.
3. Shevkani M, Kavina B, Kumar P, Purohit H, Nihalani U, Shah A. An overview of post exposure prophylaxis for HIV in health care personals: Gujarat scenario. *Indian journal of sexually transmitted diseases*. 2011 Jan;32(1):9
4. Kaplan JE, Dominguez K, Jobarteh K, Spira TJ. Postexposure prophylaxis against human immunodeficiency virus (HIV): new guidelines from the WHO: a perspective. *Clinical Infectious Diseases*. 2015 May 11;60(suppl_3): S196-9. Available at <http://www.who.int/hiv/pub/prophylaxis/09.pdf?ua=1> Accessed on February 13th, 2018.
5. World Health Organization. Post-exposure prophylaxis to prevent HIV infection: joint WH.
6. Khan AZ, Duncan KM, Escofet X, Miles WF. Do we need to improve awareness about HIV post exposure prophylaxis? *Annals of the Royal College of Surgeons of England*. 2002 Jan;84(1):72.
7. Bosena T, Chernet H. assessment of HIV exposure prophylaxis among health workers of governmental health institute in jimma zone, Oromia Region, south west Ethiopia. *Ethiop J. health sci*. 2010;1:55-64.
8. Aminde LN, Takah NF, Dzudie A, Bonko NM, Awungafac G, Teno D, Mbuagbaw L, Sliwa K. Occupational post-exposure prophylaxis (PEP) against human immunodeficiency virus (HIV) infection in a health district in Cameroon: Assessment of the knowledge and practices of nurses. *PLoS One*. 2015 Apr 16;10(4):e0124416.
9. Mponela MJ, Oleribe OO, Abade A, Kwesigabo G. Post exposure prophylaxis following occupational exposure to HIV: a survey of health care workers in Mbeya, Tanzania, 2009-2010. *Pan African Medical Journal*. 2015;21(1).
10. Sarah OA, Akinsegun AA, Charles JE, Adewumi A, Majeed O, Ebele U. Knowledge, attitude and practices of HIV post exposure prophylaxis amongst health workers in Lagos University Teaching Hospital. *Occupational Medicine & Health Affairs*. 2014;2:149.
11. Omorogbe VE, Omuemu VO, Isara AR. Injection safety practices among nursing staff of mission hospitals in Benin City, Nigeria. *Annals of African medicine*. 2012;11(1).
12. Kothari CR. Research methodology: Methods and techniques. New Age International; 2004.
13. Uzochukwu BS, Sibeudu FT, Ughasoro MD, Okwuosa C, Onwujekwe OE. How do Primary Health Care Workers Perceive and Practice Post Exposure Prophylaxis for HIV in Enugu State. *J AIDS Clin Res*. 2014;5(381):2.
14. Okoh M, Saheeb BD. Assessment of knowledge, attitude and practice of post-exposure prophylaxis against blood-borne viral infection among dental surgeons in a teaching hospital. *Southern African Journal of Infectious Diseases*. 2017 Mar 23;32(1):17-22.
15. Mathewos B, Birhan W, Kinfie S, Boru M, Tiruneh G, Addis Z, Alemu A. Assessment of knowledge, attitude and practice towards post exposure prophylaxis for HIV among health care workers in Gondar, North West Ethiopia. *BMC public health*. 2013 Dec;13(1):508.

16. Singh G, Din Ahmad MU, Muneer S, Sabah NU, Baig W. Assessment of knowledge, attitude and practice towards post exposure prophylaxis for HIV among health care professionals in Lahore. *Occup. Med. Health Aff.*. 2015;3:208-18.
17. Ajibola S, Akinbami A, Elikwu C, Odesanya M, Uche E. Knowledge, attitude and practices of HIV post exposure prophylaxis amongst health workers in Lagos University Teaching Hospital. *The Pan African medical journal*. 2014;19.
18. Owolabi RS, Alabi P, Ajayi S, Daniel O, Ogundiran A, Akande TM, Onafowokan AT. Knowledge and practice of post-exposure prophylaxis (PEP) against HIV infection among health care providers in a tertiary hospital in Nigeria. *Journal of the International Association of Physicians in AIDS Care*. 2012 Jun;11(3):179-83.
19. Ekundayo OT, Ogbaini-Emovon EA. Knowledge, attitude and practice of human immunodeficiency virus infection post-exposure prophylaxis among resident doctors in a tertiary hospital, benin city, Nigeria. *International Journal of Community Research*. 2014;3(3):68-73.
20. Monera T, Ncube P. Assessment of knowledge, attitude and practice of health care workers on occupational HIV post exposure prophylaxis at Zimbabwean referral hospital. *J Int AIDS Soc*. 2012;15(4):523-30.
21. Chagani MM, Manji KP, Manji MP, Sheriff FG. Healthcare workers' knowledge, attitudes, practices on post exposure prophylaxis for HIV in Dar es Salaam. *Tanzania Medical Journal*. 2011;25(2):33-8.
22. Biyadgie A, Yenesew T, Girma A. Knowledge, attitude, practice and associated factors towards post exposure prophylaxis to HIV infection among health care professionals in Debre Markos town public health institutions, Northwest Ethiopia. *Clinical Practice (Therapy)* 2017; 14(6):2044-9046. Available online at: <https://www.openaccessjournals.com/articles/knowledge-attitude-practice-and-associated-factors-towards-post-exposure-prophylaxis-to-hiv-infection-among-health-care-profession-12275.html> Accessed on 17th July 2018
23. Tesfaye G, Gebeyehu H, Likisa J. Knowledge, attitude and practice towards HIV post-exposure prophylaxis of health professionals of Gimbi town in Ethiopia: a cross-sectional study. *International Journal of Research in Medical Sciences*. 2017 Jan 23;2(2):468-71.

