HIV Non-Occupational Post-Exposure Prophylaxis Awareness Among Undergraduate Students of a Private University in South-West Nigeria

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Abstract

Objectives: The Human Immunodeficiency virus causes an infection of public health importance with about 71% of the global burden in Sub-Saharan Africa. In Nigeria, 3.2 million people are living with HIV, and 838,000 - 1.3 million of the cases are found among youths. Although Non-Occupational Human Immunodeficiency Virus (HIV) post-exposure prophylaxis (nPEP) is a safe and efficacious method of HIV prevention, it remains an underutilized prevention strategy in Nigeria. This study aimed to determine the awareness level of nPEP after sexual and other non-occupational exposure to HIV among undergraduate students of a private University.

Methods: A descriptive cross-sectional survey was conducted among 395 undergraduates' students. Data was collected by pre-tested structured self-administered questionnaires. Data obtained from the study were analyzed using the IBM SPSS Statistics version 20 software program and Frequency distribution tables with percentages and cross-tables were used for data description.

Results: About 42.8% were aware of nPEP. Most of the respondents 361 (91.4%) knew that PEP is to be given after HIV exposure risk following sexual intercourse. Although 79.5% of the respondents indicated that they will see their physician after unprotected sexual intercourse and other non-occupational exposure to HIV, the majority neither knows about nPEP initiation time, 247 (62.5%) nor its duration, 286 (72.4%).

Conclusions: A low level of awareness was observed among our study participants, therefore, consistent health education and promotion of nPEP will improve its awareness, uptake, and possibly reduce the prevalence of HIV among our youths.

Keywords: HIV, Nigeria, Non-Occupational Exposure, Post-exposure prophylaxis, Sexual intercourse, Undergraduates

Plain English Summary: Human immunodeficiency virus (HIV) is a public health problem that is ravaging significant proportions of the global community and more also in Sub-Sahara Africa. One of the interventions to prevent the transmission of HIV is the use of Post-exposure prophylaxis (PEP) in occupational and non-occupational (NPEP) settings. PEP is a short-term treatment with anti-HIV drugs given to uninfected persons within 72 hours following exposure to genital secretions, potentially-infected
blood, or other bodily fluid to reduce the likelihood of HIV infection either in occupational setting or through sexual intercourse or non-occupational (nPEP) settings. The study was conducted to determine the awareness level of nPEP among undergraduates after sexual and other non-occupational exposure to HIV. Pretested structured self-administered questionnaires were shared among our Undergraduates students. Participants were from across the various schools of Babcock University. A low level of awareness of HIV nPEP was observed among our study participants; consistent health education and promotion of NPEP will improve its awareness, uptake, and possibly reduce the prevalence of HIV among our youths.

**Background**

Human immunodeficiency virus (HIV) is a public health problem that is estimated to affect thirty-five million people worldwide (1) and about 71% of the global burden is found in Sub-Saharan Africa (1, 2). It has also been estimated that 90 million people will eventually be infected with HIV in Africa (3). In Nigeria, 3.2 million people are estimated to be living with HIV (4) while between 838,000 and 1.3 million cases are found among the youths (5). Although prevention of exposure to HIV remains the most effective method of preventing infection (6), some studies have shown that the use of post-exposure prophylaxis (PEP) is efficacious in preventing HIV infection within 72 hours of exposure (7, 8, 9). Yet it remains an underutilized prevention strategy in Nigeria. This is true in occupational and non-occupational (nPEP) settings (10). According to the World Health Organization, PEP is a short-term antiretroviral treatment to reduce the likelihood of HIV infection after potential exposure either occupationally or through sexual intercourse (11).

The Centre for Disease Control (CDC) defines HIV PEP as taking a 28-day course of antiretroviral (ARV) drugs within 72 hours of exposure to prevent HIV infection (6). When administered specifically following non-occupational exposure like following exposure to genital secretions, potentially-infected blood, or other bodily fluid in the setting of significant sexual or injection-drug encounters with a known HIV positive individual (12), it is referred to as non-occupational post-exposure prophylaxis (nPEP) (6).

NPEP has been described as a safe, cost-effective, and practical method of HIV prevention, and every individual especially those with risky sexual behaviors should be aware of it (12). A lot of data has been published on the awareness of PEP in Occupational settings but the data on nPEP awareness is sparse especially in Nigeria (12, 13). Considering the high prevalence of risky sexual behavior and HIV infection among the youth (14), determining the awareness of NPEP with the provision of relevant information will reduce the burden of HIV among this age group. Therefore, this study aimed to determine the awareness of nPEP after sexual and other non-occupational exposure to HIV among undergraduate students of Babcock University.

**Methods**

**Study site and design**

The study was conducted in Babcock University Ilishan Remo, Ogun State (6°53′32.406″ N, 3°42′49.2588″ E). It is a private Christian university-owned and operated by the Seventh-day Adventist Church in Nigeria. Babcock University offers Foundation studies, Pre-degree programs, Undergraduate programs, and Post-graduate programs.

This was a descriptive cross-sectional study undertaken among 395 undergraduates of Babcock University, Ilishan-Remo, Ogun State, Nigeria. The study was conducted from November 2016 till March 2017. Only single undergraduate students and those that gave consent for participation in this study were recruited for the study. Babcock University postgraduate students and married undergraduate students were excluded from the study.

**Sampling**

The sample size was calculated according to the formula for determining the minimum required sample size in a prevalence study (15), n = N/1+N(e)², with confidence interval set at 95%, n signifies the sample size, N is the population size under study (Babcock University has an undergraduate population that was slightly below 10,000) and e is the level of precision (margin of error 5%) set at 0.05), the least sample size required for the study was 385. After correcting for missing or incomplete data entry with an expected response rate of 90% (0.9), the sample size increased to 424. However, at the time of data entry, only 395 were available for analysis. The stratified sampling technique was used for this study.

**Data collection**
Data was collected using a pretested structured self-administered questionnaire and it contained 20 questions. The questionnaire assessed the knowledge and perception of post-exposure prophylaxis after sexual and non-occupational exposure to HIV. The questionnaire was grouped into 3 sections. The first section, Section A, titled Social Demographics Characteristics sought to harvest information about the participants such as the gender, age, school or college, course of study, department of study, level of study, religion and ethnicity. Section B (Awareness), sought to find out the knowledge of the participant concerning the study. This included knowledge about HIV, its transmission and prevention, knowledge of PEP. The last section, Section C, sought to know the perception of the participant concerning HIV and its prevention.

Data analysis

### Table 1. Socio-demographic characteristics of the respondents

| Characteristics                          | Frequency (f) | Percentage (%) |
|------------------------------------------|---------------|----------------|
| Gender                                   |               |                |
| Male                                     | 168           | 42.5           |
| Female                                   | 227           | 57.5           |
| Total                                    | 395           | 100            |
| Religion                                 |               |                |
| Christian                                | 365           | 92.4           |
| Muslim                                   | 26            | 6.6            |
| African Traditional Religion             | 0.0           | 0.0            |
| Total                                    | 395           | 100            |
| Ethnicity                                |               |                |
| Yoruba                                   | 201           | 50.9           |
| Igbo                                     | 115           | 29.1           |
| Hausa                                    | 14            | 3.5            |
| Others                                   | 65            | 16.5           |
| Total                                    | 395           | 100            |
| School                                   |               |                |
| Benjamin Carson School of Medicine       | 102           | 25.8           |
| School of Science and Technology         | 26            | 6.6            |
| School of Computing and Engineering Science | 25           | 6.3            |
| School of Education and Humanities       | 31            | 7.8            |
| School of Law and Security studies       | 43            | 10.9           |
| School of Nursing                        | 15            | 3.8            |
| School of public and Allied Health       | 19            | 4.8            |
| School of Management Science             | 73            | 18.5           |
| Veronica Adeleke School of Social Science| 61            | 15.4           |
| Total                                    | 395           | 100            |

Knowledge of HIV, Its modes of transmission and Its Preventive Strategies

Almost all our respondents were aware of HIV, while (5.3%) had not heard about HIV. Almost all the respondents, 96.5% knew the modes of HIV transmission while only 3.5% did not. Among those who knew the modes of transmission of HIV, 94.6% believed that sexual intercourse is the dominant mode of HIV transmission, while other non-occupational HIV transmissions methods like
getting a haircut (66.4%), pedicuring/Manicuring (56.7%), and sharing of needles or sharp objects (91.6%) were represented. The other outcomes are presented in Table 2 below.

Table 2: Knowledge of HIV and Its modes of transmission

| Questions                                      | Frequency (f) | Percent (%) |
|------------------------------------------------|---------------|-------------|
| Have you heard of HIV                          |               |             |
| Yes                                            | 374           | 94.7        |
| No                                             | 21            | 5.3         |
| Total                                          | 395           | 100         |
| Do you know the modes of transmission of HIV   |               |             |
| Yes                                            | 381           | 96.5        |
| No                                             | 14            | 3.5         |
| Total                                          | 395           | 100         |
| If yes (N=381)                                 |               |             |
| Sexual intercourse                             | 361           | 94.8        |
| Hugging                                        | 9             | 2.4         |
| Shaking hands                                  | 10            | 2.6         |
| Hair cut at the saloon                         | 253           | 66.4        |
| Pedicuring/Manicuring                          | 216           | 56.7        |
| Sharing needles or sharps                      | 349           | 91.7        |
| Pregnancy and lactation                        | 272           | 71.4        |
| Touching common objects touched by an infected person | 36           | 9.5         |
| Sharing of toothbrushes with an infected person | 237          | 62.2        |
| Sharing of cutlery with an infected person     | 120           | 31.5        |

Multiple responses were allowed

The majority of the respondents (95.4%) knew how HIV can be prevented; only 4.6% did not. Among respondents’ choices of perceived prevention strategies, the use of condoms (84.3%) and avoidance of sharing of hair clippers and other sharp objects (86.6%) were high, while the use of antiviral drugs (nPEP) came last, (30.1%). Only a few of the respondents, 30/395 (7.6%) had ever utilized post-exposure prophylaxis after an exposure to HIV, while the majority, 365/395 (92.4%) had not used HIV PEP. Most (78.4%) of them had not used post-exposure prophylaxis before because they have not been exposed to HIV, while 21.9% claimed they have not been informed about nPEP before. Only five (1.4%) of these respondents had not utilized nPEP due to lack of support and encouragement and another eight (2.2%) due to fear of stigma and discrimination. Refer to Table 3 for details.

Table 3: Knowledge of HIV and Its Preventive Strategies

| Questions                                      | Frequency (f) | Percentage (%) |
|------------------------------------------------|---------------|----------------|
| Do you know HIV can be prevented?              |               |                |
| Yes                                            | 377           | 95.4           |
| No                                             | 18            | 4.6            |
| Total                                          | 395           | 100            |
| If yes (N=377)                                 |               |                |
| Use of condom                                  | 333           | 88.3           |
| Avoiding hugging                               | 5             | 1.3            |
| Avoiding of shaking of hands                   | 8             | 2.1            |
| Personal manicure/pedicure kit                 | 280           | 74.3           |
| Avoid sharing of hair clippers and other objects that can easily spread infections | 342 | 90.7 |
| Use of antiviral drugs                         | 119           | 31.6           |
| Have you used post-exposure prophylaxis after exposure to HIV? | | |
| Yes                                            | 30            | 7.6            |
| Reasons for nPEP unawareness | Yes | No | % |
|-----------------------------|-----|----|---|
| Haven’t been exposed to HIV before | 286 | 726 | 72.4 |
| Have not been informed of one | 80 | 280 | 20.3 |
| Lack of support and encouragement | 5 | 15 | 1.3 |
| Fear of stigma and discrimination | 8 | 1 | 2 |

**Awareness level of the respondents about nPEP for HIV**

About 42.8% of our respondents were aware of nPEP for HIV, while the majority, 57.2% were not aware of nPEP. Out of those who were aware of nPEP, 51.5% obtained the information from School and Hospital. Most of the respondents, 91.4% knew that PEP is to be given after HIV exposure risk, following sexual intercourse. Although 79.5% of the respondents indicated that they will see their physician after unprotected sexual intercourse and other non-occupational exposure to HIV, the majority neither knew PEP initiation time (62.5%) nor its duration (72.4%). This is further illustrated in Table 4 below.

**Table 4: nPEP awareness, Initiation time and Duration of Therapy**

| Questions                                                                 | Yes | %   | No | %   |
|---------------------------------------------------------------------------|-----|-----|----|-----|
| Have you heard of Post-exposure prophylaxis to HIV after sexual intercourse or non-occupational exposures (sex, blood transfusions, etc.) | 169 | 42.8| 226| 57.2|
| If Yes, Source of information (N= 169)                                    |     |     |    |     |
| Hospital                                                                  | 87  | 51.5| 82 | 48.5|
| School                                                                    | 87  | 51.5| 82 | 48.5|
| Seminars                                                                  | 46  | 27.2| 123| 72.8|
| Family                                                                    | 30  | 17.8| 139| 82.2|
| Friends                                                                   | 30  | 17.8| 139| 82.2|
| Internet                                                                  | 43  | 25.4| 126| 74.6|
| Other sources                                                             | 21  | 12.4| 148| 87.6|
| **Initiation time for NPEP**                                             |     |     |    |     |
| Within 72 hours of exposure                                              | 20  | 5.1 | 375| 94.9|
| After 72 hours of exposure                                               | 117 | 29.6| 278| 70.4|
| After 2 days of exposure                                                 | 11  | 2.8 | 384| 97.2|
| I don’t know                                                             | 247 | 62.5| 148| 37.5|
| **Duration of nPEP**                                                     |     |     |    |     |
| I don’t know                                                             | 286 | 72.4| 27.6|     |
| 28 days                                                                  | 8   | 2.0 | 387| 98.0|
| 40 days                                                                  | 80  | 20.3| 315| 79.7|
| 8 months                                                                 | 21  | 5.3 | 374| 94.7|
| **nPEP is prophylaxis with antiretroviral drugs to uninfected persons following exposure risk to the following** |     |     |    |     |
| Sexual intercourse                                                       | 361 | 91.4| 34 | 8.6 |
| Hugging                                                                  | 9   | 2.3 | 386| 97.7|
| Shaking hands                                                            | 10  | 2.5 | 385| 97.5|
| Hair cut                                                                 | 253 | 64.1| 142| 35.9|
| Pedicuring/Manicuring                                                    | 216 | 54.7| 179| 45.3|
| Injection- drug abuse                                                    | 349 | 88.4| 46 | 11.6|
| Pregnancy and lactation                                                  | 272 | 68.9| 123| 31.1|
| Touching common objects touched by an infected person                    | 36  | 9.1 | 359| 90.9|
| Potentially-infected blood                                               | 237 | 60.0| 158| 40.0|
| Sharing of cutlery with an infected person                               | 120 | 30.4| 275| 69.6|

**Discussion**

The rising number of individuals infected with HIV/AIDS in sub-Saharan Africa is a source of
concern and non‐occupational exposure to HIV is a common means of infection among young people (16, 17). The knowledge of the awareness of HIV prophylaxis among undergraduates was low compared to the knowledge of HIV infection itself. Ensuring adequate awareness of HIV post‐exposure prophylaxis among young people is vital to limiting and preventing the spread of HIV. A Systematic Review of research evidence and practice of HIV non‐occupational post‐exposure prophylaxis in Nigeria (17) highlights the paucity of research evidence on nPEP use in Nigeria, especially among young people. Hence, our study was designed to determine the awareness level of undergraduate students of Babcock University to HIV nPEP because young adults are known to be more involved with risky sexual behaviors (18, 19). In this study, we recorded about 42.8% awareness level of undergraduate students to nPEP. This was lower than 89% reported among Medical students in Cameroun (20), 67.1% reported among Nursing and Midwifery students in Ethiopia (21), and 20% among Pharmacy students in Malaysia (22). The lower prevalence observed in our study may have due to the heterogeneity of our study population compared to the homogenous study population of the other studies involving only Medical and Nursing students; though, this was not observed in the Malaysian study. However, the prevalence reported in our study was also lower than those reported by previous studies among Health care workers in Nigeria (23, 24, 25). The differences in the study populations assessed explains the disparity observed, as there is a paucity of reports on nPEP among young adults in Nigeria, our study could only compare with similar studies among healthcare workers.

The majority of the students were not aware of the initiation time and duration of nPEP and this means little or no knowledge of nPEP among the participants. Findings from this study indicate that very little has changed concerning awareness level and utilization of nPEP among young adults in Nigeria. There is a general lack of awareness among young people about PEP and lack of knowledge of where to access PEP when needed (16, 20). This finding aligned with reports from a 2017 National health survey, which showed that only 28.6% of young people aged 15–24 could correctly identify ways of preventing sexual transmission of HIV (26). This raises a cause for concern because young people in Nigeria are among the most vulnerable group due to several reasons including their likelihood to engage in risky sexual behavior and low HIV risk perception (27, 28, 29). The majority of the participants (92.4%) had not taken nPEP before because they have not been exposed while 74 (20.3%) did not take because of fear and stigmatization. This is similar to findings in previous studies (20, 30). However, the majority of the students answered that risky sexual exposure is an indication for nPEP and that nPEP can reduce the transmission of HIV and that they will see their physician peradventure they get exposed. These positive attitudes observed among the study participants showed their low level of awareness of NPEP is as a result of lack of education and information on NPEP. Considering the high prevalence of HIV among the African youths (31) and for nPEP to have a population‐level impact on HIV prevention, nPEP education and promotion must be intensified (17). There should be promotion and national policy on the use of HIV nPEP among this population. Our study though has its limitation, aligns with recommendation (17) of a rigorous and comprehensive research study using a large sample size be conducted on HIV nPEP in Nigeria.

Conclusion

We have been able to identify within the limits of the study the general knowledge of HIV infection among Babcock university undergraduates. Though a high general knowledge of HIV was observed among our study participants, there is a low level of awareness of post‐exposure prophylaxis among the respondents. Thus there appears to be a gap between the knowledge of HIV and the knowledge of PEP. Therefore, consistent health education and promotion of nPEP will improve its awareness, uptake, and possibly reduce the prevalence of HIV among our youths.

List of abbreviations

BUHREC: Babcock University Health Research Ethics Committee
CDC: Centre for Disease Control
HIV: Human immunodeficiency virus
nPEP: Non‐Occupational post‐exposure prophylaxis
PEP: Post exposure prophylaxis

Declarations

Ethics approval and consent to participate
The study proposal was reviewed by and ethics approval was obtained from Babcock University
Health Research Ethics Committee (BUHREC/024/17). Written informed consent to participate in the study was obtained from all participants of this study.

Consent for publication
The authors hereby give consent for the publication of our work under the creative commons CC Attribution-Noncommercial 4.0 license.

Availability of data and materials
The data and materials associated with this research will be made available by the corresponding author upon reasonable request.

Competing interests
The authors declare that they have no competing interests.

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Authors’ contributions
All authors participated in the meeting summarized by this article. CJE and TAA wrote the initial draft of the article. All other authors contributed significantly to revisions of the article. All authors approved this version of the article for publication.

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