



Awareness and Knowledge of HIV Transmission and Prevention among Military Personnel in Abuja, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author DAA designed the study and managed the literature searches while author OAA wrote the first draft of the manuscript, performed the analyses of the study, and made necessary corrections on the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: To assess the level of knowledge of HIV transmission and prevention and identify factors influencing the awareness of HIV transmission and prevention among military personnel in Nigeria.

Study design: A cross-sectional study.

Place and duration of study: The Nigerian Defense Headquarters, Abuja, Nigeria.

Methodology: Using the stratified probability sampling technique, military personnel between the age of 18 and 55 years, were recruited based on arm of service with a percentage distribution of 60:20:20 (Army, Navy, and Air Force respectively). The sample size(n) was 384 and the adjusted sample size was 427 respondents. The tool for data collection was a semi-structured self-administered questionnaire. This instrument, divided into 3 sections, was designed to obtain information on socio-demographics (sex, age, ethnic background, education level as the highest level of education attainment, experience in the military; the arm of service, rank, length of service, gender and number of sexual partners, knowledge of HIV prevention, and perception of risk of HIV

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transmission. Data were analyzed using descriptive statistics, Chi-square tests, and logistic regression at $p < 0.05$.

Results: While 98.5% of respondents have ever heard of HIV, 80.3% claimed to have seen or heard information about HIV, with media (85.9%) been the major source of this information. Out of the 391 respondents, 174 (44.5%) and 217 (55.5%) military personnel had inadequate and adequate knowledge of HIV transmission respectively while 80.8% and 19.2% of these respondents had inadequate and adequate knowledge of HIV prevention, respectively.

Conclusions: While there was no significant difference in the proportion of those military men that had adequate and inadequate knowledge of HIV transmission, there was a clear and significant difference in the proportion of military men with adequate and inadequate prevention knowledge. Age, education, marital status, and service arm are predictive factors that could influence knowledge of HIV transmission and prevention.

Keywords: Knowledge; HIV transmission; HIV prevention; and military personnel.

ABBREVIATIONS

HIV : Human Immunodeficiency Virus
AIDS : Acquired Immune Deficiency Syndrome
SDG : Sustainable Development Goals
NMP : Nigeria Military Personnel
STD : Sexually Transmitted Diseases
AFFAC : Armed Forces Programmes on AIDS
IEC : Information, Education, and Communication
STDs : Sexually Transmitted Diseases
STIs : Sexually Transmitted Infections
NAF : Nigerian Air Force
NN : Nigerian Navy
NA : Nigerian Army
FCT : Federal Capital Territory

1. INTRODUCTION

Human Immunodeficiency Virus (HIV) continues to become a generalized epidemic affecting all population groups and sparing no geographical area in Nigeria. HIV/AIDS has negatively impacted every sector of the economy and threatened the national development gains of the past decades. Despite the implementation of various programs in the last two decades, HIV/AIDS remains a challenge and the burden of disease continues to increase in Nigeria. In Nigeria, HIV prevalence among Nigerian military personnel (NMP) has been reported to be higher than that of the general population. Several reasons have been given for this, among which is the working condition of soldiers [1]. It is commonly the case that military personnel are generally young, sexually active people imbued with feelings of invincibility and a greater inclination toward high-risk behavior compared to the public. By the nature of their work, which involves a large degree of mobility

and long periods of staying away from their families, they engage in high-risk sexual behaviors that expose them to Sexually Transmitted Diseases (STDs) and HIV/AIDS [2].

Military populations have formed one of the largest and most mobile sectors of society. The personnel of the Nigerian military indulge in high-risk sexual behaviors with low condom use, which puts them at high risk of contracting STDs, including HIV. The implications of this are two-fold. Firstly, the risk of contracting HIV may threaten the preparedness of the military to carry out its functions, which is to maintain the country's territorial security and secure its borders from violation on land, sea, or air. Secondly, since military personnel lives amongst the civilian population, they can serve as a potential core transmission group of these infections to the larger population [2]. Therefore, to enforce or improve HIV prevention strategies in Nigeria, it is imperative to encourage, public sensitization, information, education, and communication; condom promotion, and behavior change campaigns among the military men.

Nigerian government with the support of non-governmental organizations consistently conducts public education campaigns about HIV/AIDS transmission and prevention. Interventions currently being used to limit HIV transmission include promoting abstinence before marriage; encouraging faithfulness to one partner, through a combination of mass media campaigns and counseling; and various HIV education programs [2]. Some of these efforts are likely to bear fruit if they are sustained and spread across the entire country. Primary prevention interventions targeted at vulnerable populations are one of the most

realistic strategies for controlling the further spread of HIV in the country [3]. The most effective interventions are those that focus on population groups with the highest transmission rates. Prevention through behavior change, condom promotion, and Sexually Transmitted Infections (STIs) treatment are thought to be the most cost-effective approach [4]. The Armed Forces Programmes on AIDS (AFPAC), which came into being in 1987, has been at the forefront of the national efforts against HIV/AIDS in the military. AFPAC is a comprehensive program focusing on both prevention and treatment for uniformed personnel, their family members, and military schools. The main areas of the AFPAC program include reduction in the transmission of HIV/AIDS and other STIs through preventive education, promotion of healthy behavior, and risk reduction strategies; voluntary counseling and testing; treatment of infected persons; and provision of home-based care and support for people living with HIV/AIDS. The major risk reduction activities of the program include the development and distribution of information, education, and communication (IEC) materials, behavior change communication activities, condom promotion, training of counselors, and establishment of counseling centers in health facilities training and use of peer education approach.

In Nigeria as elsewhere, personnel in the military are an important target for primary prevention interventions because they have a high risk of exposure to STIs including HIV [3]. In peacetime, STI infection rates among armed forces are generally 2 to 5 times higher than in comparable civilian populations and are even greater in times of conflict. AIDS is now the leading cause of death in military and police forces in some African countries, accounting for more than half of in-service mortality [3]. The burden of this disease can however be reduced if the focus can be the strategy of improving change in sexual behavior among the military men. Sexual behavior of adolescents is important not only because of the possible reproductive outcomes but also because risky sexual behavior, such as unprotected sex and low and inconsistent condom usage during sexual intercourse has been associated with increased HIV infection [5].

Despite the initiation and implementation of various strategies of improving adequate knowledge of HIV transmission and prevention,

there is still a high proportion of military personnel without adequate knowledge of preventing transmission of HIV. Therefore, this study will add to the body of knowledge through the identification of predictors of poor level of knowledge and perception of HIV transmission and prevention among military personnel, who are among the most at-risk groups for HIV infection. It will also provide pointers to areas where interventions could be focused, particularly to improve HIV prevention among military personnel. Provision of mitigating solutions to the problem can contribute to personnel education and awareness, programming strategies by the military to improve the health and well-being of their officers and men. Understanding the soldiers' sexual behavior may also assist in obtaining insight into the best approach to prevent HIV among the military. This study aims to assess the level of knowledge of HIV prevention and transmission among military personnel in Abuja, Nigeria. This study also identifies factors that might be influencing knowledge and perception of HIV prevention and transmission among the military personnel in Nigeria.

2. METHODOLOGY

This study was carried out in Abuja, the capital city of Nigeria, which situates in the center of the country (spanning 713 km² on coordinates 9°4'0" North and 7°29'0" East of the equator), within the Federal Capital Territory (FCT). Population in Abuja comprises mainly civil servants, businessmen, and women, traders, security operatives such as military and paramilitary forces. The Nigerian Armed Forces comprise the Nigerian Army (NA), the Nigerian Air Force (NAF), and the Nigerian Navy (NN). Nigerian Armed Forces have its headquarters at Abuja and various units in each state of the federation. The forces are composed predominantly of males.

This is a cross-sectional survey of uniformed personnel in the Nigerian Defense Headquarters, Abuja. The inclusion criteria consist of uniformed men in all three arms of the force, working and residing in Abuja, FCT. They are deployed to combat war locally and internationally anytime the need arises. The sample size(n) was 384 and the adjusted sample size was 427 respondents. Using the stratified probability sampling technique, participants were recruited based on arm of service with a percentage distribution of

60:20:20 (Army, Navy, and Air Force respectively). Proportional allocation was applied according to the percentage distribution set at 60:20:20 (Army, Navy, Air Force respectively). Therefore, the sample size was 257 respondents for Nigerian Army while 86 respondents were for the Navy and Air Force, respectively.

The tool for data collection was a structured self-administered questionnaire. A modified version of an Armed Forces Programme on AIDS Control (AFPAC) HIV/AIDS prevention indicator survey questionnaire was used. This instrument, divided into 3 sections, was designed to obtain information on socio-demographics (sex, age, ethnic background, education level as the highest level of education attainment, experience in the military; the arm of service, rank, length of service, gender and number of sexual partners, knowledge of HIV prevention, and perception of risk of HIV transmission. To confirm the reliability of the instrument, analysis of pre-test data was done using Cronbach's Alpha correlation coefficient of the Statistical Package for Social Sciences (SPSS). Cronbach's alpha is a measure used to assess the reliability, or internal consistency of any given measurement, and refers to the extent to which it is a consistent measure of a concept [6]. This was done to ascertain the psychometric properties of the instrument. According to this approach, the result showed a correlation coefficient greater than 0.05 and this is said to be reliable. The dependent variables in this study were HIV transmission and HIV prevention knowledge among military personnel at the Defense Headquarters, Abuja, while the independent variables include age, sex, relationship status, education, ethnicity, religion, military experience. HIV transmission and prevention knowledge scores were calculated according to the fact that military personnel can answer yes or no to questions used to define the dependent variables. The scores were divided into two categories, inadequate and adequate knowledge. The HIV transmission knowledge score was computed by summing the overall score over 10. Participants that affirmatively answered to all correct methods and negatively to all incorrect methods of HIV transmission had a perfect score of 10. Those with affirmed 3 correct and negated 6 incorrect methods scored 9, while those with affirmed 2 and negated 6 incorrect methods of transmission scored 8. These scores were classified as 'adequate knowledge'.

Respondents that had a summation of affirmed responses to between 0 and 2 correct methods and any number of negative responses (between 0 and 6), were all classified as 'inadequate knowledge'.

The HIV prevention knowledge score was computed by summing the overall score over 16. Participants that affirmatively answered to all correct modes and negatively to all incorrect modes of HIV prevention had a perfect score of 16, those with affirmed responses between 4-7 correct and negated 6 incorrect methods scored 9, while those with affirmed 2 and negated 6 incorrect methods of transmission scored 8; these scores were classified as 'adequate knowledge'. Respondents that had a summation of affirmed responses to between 0 and 2 correct methods and any number of negative responses (between 0 and 6), were all classified as 'inadequate knowledge'.

Data entry, cleaning, and analyses were carried out using SPSS. 16.0 statistical software (SPSS Inc. USA). Descriptive statistics such as graphs, charts, mean, and standard deviation was used to summarize data. A bivariate analytic tool: Chi-square test was used to establish the relationship between sexual behavior, knowledge of HIV transmission and prevention, and socio-demographic variables. Logistic regression was used to determine the strength of association between the dependent and independent variables. In the analysis carried out, statistical significance was considered at $P \leq 0.05$.

3. RESULTS

3.1 Socio-demographic Characteristics of the Respondents

The ages of the respondents ranged from 18-55 years with a mean of 34 years ± 1.89 (median = 36). The total number of respondents was 397 (that is, a response rate of 93%), out of which 13.4% were female. The majority (40.3%) were aged 35-44 years, while most of the respondents (69.3%) were married. Two hundred and ninety-one (73.3%) respondents are Christians while 26.7% are Muslims. Two hundred and thirty-three (58.7%) had tertiary education while 154 (38.8%) had secondary education, 7 (1.8%) primary, and 3 (0.8%) had no formal education. Many of the respondents, 151 (38.0%) were from other ethnic backgrounds,

while Yoruba were 111 (28.0%), Igbos were 59 (14.9%) and Hausas were 76 (19.1%).

Table 1 shows that 98.5% of the respondents have heard of HIV and 96.4% believed it exists. Three hundred and seventeen respondents have heard or seen information about the HIV, with the media (85.9%) been the major source of this information while AFPAC/EPIC initiative accounting for 1.8% as a source of information.

Table 2 represents the responses of the respondents to questions used to compute the knowledge scores of HIV transmission among the military personnel.

3.2 HIV Modes of Prevention

Of the 391 military personnel that responded to the possibility of preventing HIV infection, 372 (95.1%) believed that something can be done to prevent HIV while 19 (4.9%) believed that nothing can be done to prevent the disease.

Table 1. Awareness of HIV

| Variables | Frequency (%) |
|--|---------------|
| Ever heard of HIV | |
| No | 6 (1.5) |
| Yes | 391 (98.5) |
| <i>Total</i> | 397 (100.0) |
| Do you believe it exists? | |
| No | 6 (1.5) |
| Yes | 377 (96.4) |
| Unsure | 5 (1.3) |
| Don't know. | 3 (0.8) |
| <i>Total</i> | 391 (100.0) |
| Heard or seen any information about the AIDS virus. | |
| No | 77 (19.7) |
| Yes | 314 (80.3) |
| <i>Total</i> | 391 (100.0) |
| Source of information | |
| Media | 336 (85.9) |
| Family/Friends | 5 (1.3) |
| Co-worker | 11 (2.3) |
| Sex-partner | 2 (0.5) |
| Health worker | 24 (6.1) |
| AFPAC/EPIC initiative | 7 (1.8) |
| Others | 6 (1.5) |
| <i>Total</i> | 391 (100.0) |

Table 2. Knowledge scores for HIV transmission

| Variables | No (%) | Yes (%) | Total (%) |
|-------------------------------------|------------|------------|-------------|
| Correct | | | |
| From pregnant women to unborn child | 134(34.3) | 257 (65.7) | 391 (100.0) |
| Sex with an infected person | 14 (3.6) | 377 (96.4) | 391 (100.0) |
| Blood transfusion | 34 (8.7) | 357 (91.3) | 391 (100.0) |
| Contaminated or re-used needles | 62 (15.9) | 329 (84.1) | 391 (100.0) |
| Incorrect | | | |
| Using a toilet | 372 (95.1) | 19 (4.9) | 391 (100.0) |
| Mosquito bites | 364 (93.1) | 27 (6.9) | 391 (100.0) |
| Sharing eating utensils | 113 (35.3) | 278 (71.1) | 391 (100.0) |
| Shaking hands/non-intimate contact | 365 (93.4) | 26 (6.6) | 391 (100.0) |
| Circumcision | 138 (35.3) | 253 (64.7) | 391 (100.0) |
| Others | 273 (69.8) | 118 (30.2) | 391 (100.0) |

Table 3 also represents the proportion of military personnel that responded to questions that relate to ways of preventing HIV transmission. These are questions used to compute knowledge scores of HIV prevention.

With reference to Fig. 1, out of the 391 respondents that indicated that they knew about HIV transmission, 174 (44.5%) military

personnel had inadequate knowledge with 0-7 scores, while 217 (55.5%) personnel had adequate knowledge of HIV transmission with scores of 8-10. Out of the 391 personnel that knew about HIV prevention, 80.8% of these respondents had inadequate knowledge, while only 19.2% had adequate knowledge of HIV prevention.

Table 3. Knowledge scores for HIV prevention

| Variables | No (%) | Yes (%) | Total (%) |
|--|------------|------------|-------------|
| Correct | | | |
| Abstinence | 96 (24.6) | 295 (75.4) | 391 (100.0) |
| Using condoms | 38 (9.7) | 353 (90.7) | 391 (100.0) |
| Stick to one partner | 38 (9.7) | 353 (90.7) | 391 (100.0) |
| No sex with prostitutes | 74 (18.9) | 317 (81.1) | 391 (100.0) |
| No sex with casual partners | 89 (22.8) | 302 (77.2) | 391 (100.0) |
| Avoid blood transfusion | 122 (31.2) | 269 (68.8) | 391 (100.0) |
| Avoid sharing shaving blades | 48 (12.3) | 343 (87.7) | 391 (100.0) |
| Avoid sharing nail cutter | 74 (18.9) | 317 (81.1) | 391 (100.0) |
| Avoid injection with contaminated needles | 54 (13.8) | 337 (86.2) | 391 (100.0) |
| Incorrect | | | |
| Prevention by prayer | 237 (60.6) | 154 (39.4) | 391 (100.0) |
| Avoid kissing | 298 (76.2) | 93 (23.8) | 391 (100.0) |
| Avoid mosquito bites | 367 (93.9) | 24 (6.1) | 391 (100.0) |
| Avoid herbal preparations | 382 (97.7) | 9 (2.3) | 391 (100.0) |
| Avoid antibiotics, injections, and other medications | 374 (95.7) | 17 (4.3) | 391 (100.0) |
| Seek protection from a traditional healer | 385 (98.5) | 6 (1.5) | 391 (100.0) |
| Others | 378 (96.7) | 13 (3.3) | 391 (100.0) |

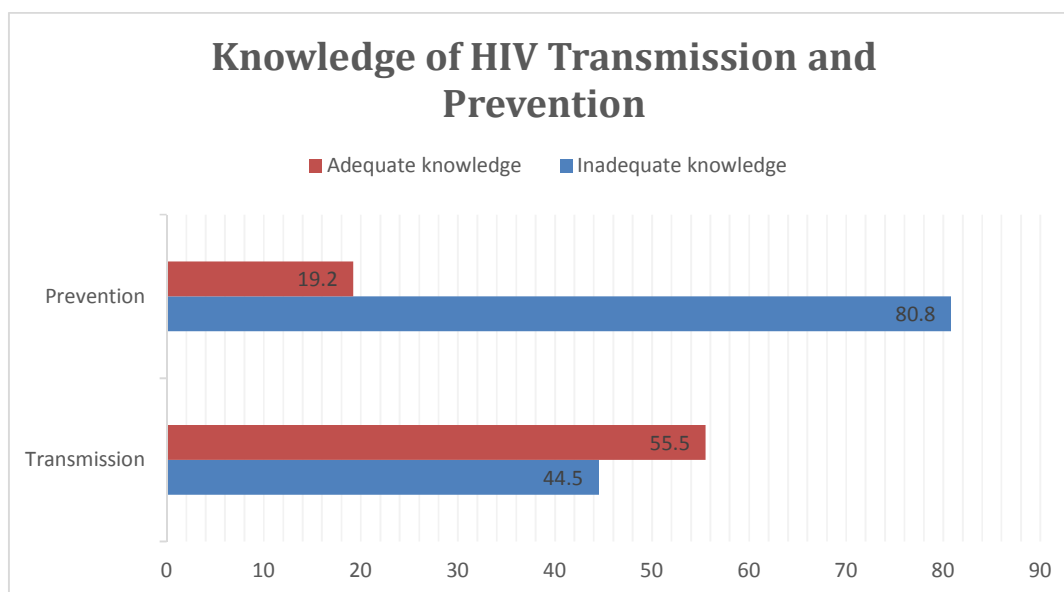


Fig. 1. Knowledge categories for HIV transmission and prevention

Table 4. knowledge of HIV prevention and socio-demographic characteristics

| Variables | Inadequate knowledge | Adequate knowledge | X² values | P values |
|-----------------------|-----------------------------|---------------------------|-----------------------------|-----------------|
| Gender | | | | |
| Male | 275 (81.4) | 63 (18.6) | 0.47 | 0.491 |
| Female | 41 (77.4) | 12 (22.6) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Age group | | | | |
| 18-24 | 2 (66.7) | 1 (33.3) | 2.31 | 0.510 |
| 25-34 | 6 (85.7) | 1 (14.3) | | |
| 35-44 | 117 (77.5) | 34 (22.5) | | |
| 45-55 | 191 (83.0) | 39 (17.0) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Education | | | | |
| None | 2 (66.7) | 1 (33.3) | 2.31 | 0.510 |
| Primary | 6 (85.7) | 1 (14.3) | | |
| Secondary | 117 (77.5) | 34 (22.5) | | |
| Tertiary | 191 (83.0) | 39 (17.0) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Marital Status | | | | |
| No | 79 (83.2) | 16 (16.8) | 0.44 | 0.506 |
| Yes | 237 (80.1) | 59 (19.9) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Service arm | | | | |
| Army | 182 (77.4) | 53 (22.6) | 4.49 | 0.106 |
| Navy | 68 (87.2) | 10 (12.8) | | |
| Air Force | 66 (84.6) | 12 (15.4) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Rank | | | | |
| Officers | 20 (80.0) | 5 (20.0) | 0.012 | 0.914 |
| Others | 296 (80.9) | 70 (19.1) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Ethnicity | | | | |
| Yoruba | 85 (79.4) | 22 (20.6) | 7.91 | 0.048* |
| Igbo | 49 (83.1) | 10 (16.9) | | |
| Hausa | 53 (70.7) | 22 (29.3) | | |
| Others | 129 (86.0) | 21 (14.0) | | |
| Total | 316 (80.8) | 75 (19.2) | | |
| Religion | | | | |
| Christianity | 237 (82.9) | 49 (17.1) | 2.88 | 0.089 |
| Islam | 79 (75.2) | 26 (24.8) | | |
| Total | 316 (80.8) | 75 (19.2) | | |

*Significant at P=0.05

As shown in Table 4, only 18.6% of the male personnel and 22.6% of the female personnel had adequate knowledge of HIV prevention. Lower proportions of the personnel in all age groups and levels of education had adequate knowledge of HIV prevention, though age group 18-24 years and no formal education experienced the highest proportion of adequate knowledge of HIV prevention (33.3%) compared to others. Sixteen (16.8%) of 95 unmarried personnel and 59 (19.9%) of 296 married personnel had adequate knowledge of HIV prevention. About 23% of Army personnel had

adequate knowledge, while about 13% and 15% of Navy and Air Force personnel respectively had adequate knowledge of HIV prevention. This shows that a higher proportion of Army personnel had adequate knowledge of HIV prevention compared to other service arms. Twenty percent of Officers and 19% of other ranks had adequate knowledge of HIV prevention. Less than 30% of the personnel in Yoruba, Igbo, Hausa, and other ethnic groups had adequate knowledge of HIV prevention, respectively. Hausa (29.3%) military personnel seems to have better knowledge of HIV

prevention. The analysis showed a statistical significance between knowledge of HIV prevention and ethnicity at $p < 0.05$ ($X^2=7.91$, $P=0.048$). Finally, about 17.1% of respondents that are Christians and 24.8% of Muslims had adequate knowledge of HIV prevention. In all, there was no statistical association at $p < 0.05$ between knowledge of HIV prevention and socio-demographic characteristics, except ethnicity which was significant at $p < 0.05$.

Table 5 shows that the respondents in the age group of 25-34 years and 35-44 years were respectively, about 0.4 times and 0.5 times more likely to have good knowledge of HIV prevention than those in the reference (45-55 years age) group. These observations were significant with $P = 0.004$ and $P = 0.037$ respectively for the age groups. However, military personnel in the 18-24 years age group were 0.6 times more likely to have good knowledge of HIV prevention than those in the 45-55 years age group but this is not statistically significant. Army personnel was about 2.6 times more likely to have good knowledge of HIV prevention than those in the Navy, and this was statistically significant at $p < 0.05$. Respondents in the Air Force were 1.2 times more knowledgeable of HIV prevention

than those in the Army. This observation was however not statistically significant with $P = 0.475$.

3.3 Change in Behavior to Prevent HIV/AIDS Infection

About 96.5% of the respondents reported having changed behavior to prevent contracting HIV/AIDS. However, 16.0% and 19.9% of the respondents changed behavior to prevent infection with HIV by not having sex and by stopping all sexual acts, respectively. About 74.5% of these respondents started using a condom, 82.0% restricted to one sex partner, and 61.5% reduced the number of sex partners. Almost 77% of the respondents advised partners to be faithful, 51.2% said 'no' to homosexual contacts, 75.1% ensured sterilized needles and 71.1% avoided sharing razors or clippers. Among those that reported having 'no' or 'small' risk of getting HIV, 61.8% reported that they abstain from sex, while 87.7%, 81.8%, 74.7%, and 78.9% reported avoiding multiple sex partners, sex with prostitutes, sex with homosexuals and sex with casual partners, respectively. Two hundred and thirty-five respondents (82.5%) reported using a condom during sexual acts.

Table 5. Logistic regression

| Logistic regression of Ever heard or seen any information on HIV/AIDS | | | | |
|--|-------------|-----------------|-----------|---------------|
| Variables | Beta | P-values | OR | 95% CI |
| Service arm (ref-Army) | | | | |
| Navy | -0.653 | 0.030* | 0.520 | 0.288-0.939 |
| Air Force | 0.180 | 0.615 | 1.197 | 0.594-2.410 |
| Age group (ref-18-24) | | | | |
| 25-34 | 0.764 | 0.058 | 2.147 | 0.975-4.731 |
| 35-44 | 1.563 | 0.000* | 4.772 | 2.082-10.936 |
| 45-55 | 1.792 | 0.001* | 6.000 | 2.109-17.066 |
| Marital Status (ref-Single) | | | | |
| Married | 0.670 | 0.015* | 1.954 | 1.139-3.351 |
| Logistic regression of Knowledge of HIV prevention | | | | |
| Age group (ref-45-55) | | | | |
| 18-24 | -0.507 | 0.261 | 0.602 | 0.248-1.460 |
| 25-34 | -0.953 | 0.004* | 0.386 | 0.203-0.731 |
| 35-44 | -0.669 | 0.037* | 0.512 | 0.273-0.961 |
| Service arm (ref-Army) | | | | |
| Navy | -0.966 | 0.000* | 0.381 | 0.224-0.646 |
| Air Force | 0.195 | 0.475 | 1.215 | 0.712-2.075 |
| Rank (ref- Officers) | | | | |
| Other ranks | -0.922 | 0.055 | 0.398 | 0.155-1.019 |
| Education (ref- None) | | | | |
| Primary | -1.609 | 0.278 | 0.200 | 0.011-3.661 |
| Secondary | -0.600 | 0.627 | 0.549 | 0.049-6.180 |
| Tertiary | -0.251 | 0.838 | 0.778 | 0.070-8.703 |

*Significant at $P=0.05$

4. DISCUSSION

4.1 Socio-demographic Characteristics

The mean age of respondents in this study was 35.89 years. This value is above the mean age in similar studies among Karachi fishermen, [7] among military recruits in Zaria, Nigeria, [8] and among the military in Sierra Leon [9]. The age range represents a period of high sexual activities in the general population thus it will usually remain an area of public health interest to HIV/AIDS issues. More than two-thirds of the respondents are married. There were more married respondents in previous studies (82.2% [7] and 70.5% [10]). Despite the itinerant nature of the military job, these men have homes and spouses they return to after their assignments. Their risky sexual lifestyles, while they are away, might put their wives at equal risk of the HIV disease since couples are traditionally not expected to use sexual safeguards except for contraceptives purposes.

4.2 Military Personnel Knowledge of HIV Transmission and Prevention

It is well known that the future trend of the HIV pandemic to a large extent depends on the level of HIV/AIDS awareness and knowledge in both civilian and military populations. Furthermore, an appreciable level of knowledge of the different modes of transmission of HIV and how to prevent it, are important prerequisites for behavior change. For this reason, most national programs have put a great deal of effort into information, education, and communication (IEC) campaigns. Over half of the respondents had adequate knowledge of HIV transmission, while a significant proportion of respondents (80.8%) have inadequate knowledge of HIV prevention. In addition, some still have misconceptions and partial knowledge of the modes of transmission of HIV and practice invalid preventive measures. HIV/AIDS health education campaigns need to focus on these issues. This finding is dissimilar to the findings among the military, in which only 40.0% of the respondents had good knowledge of HIV transmission and prevention, while 25.0% had poor knowledge of HIV/AIDS [11]. These proportions are quite different from the findings in which most of the military recruits (93.6%) indicated that HIV can be transmitted through infected blood transfusion and 86.7% knew that HIV could be transmitted through unprotected

heterosexual/bisexual [8]. Similarly, a study showed that 71.0% of Nigerian naval personnel and 92.8% of army personnel had good knowledge of HIV transmission [3]. The proportion of military personnel with adequate knowledge of HIV transmission and prevention in this study is not appreciable enough and it might be largely due to their constant postings out of the base that might have made them miss the opportunity of benefitting from organized HIV awareness and counseling programs. The aftermath of not having adequate information about HIV transmission and prevention among the military personnel might result in the practice of risky unprotected sexual escapades, thereby increasing the burden of the disease in the community. Therefore, to achieve the 2030 sustainability Developmental Goals, there is a need for a targeted intervention of a thorough and sustained campaign on improving knowledge of HIV/AIDS among military personnel.

Even though the prevalence of HIV knowledge and means of prevention are not encouraging, three-quarters of all respondents reported the use of condoms during sexual intercourse. This is like the high prevalence of condom use (60%) reported among sexually active tertiary students in Ethiopia, [12] while a South African study revealed 44.5% of women respondents inconsistently used condoms in their last sexual practice [13]. However, the statistic of this study shows that those having sex without protection have heightened risk of HIV transmission and create a potential trap of infection to unprotected future partners with negative HIV status.

Chi-square analysis carried to determine the possible factors responsible for the lower proportion of military personnel having adequate knowledge of HIV transmission and prevention shows that majority of personnel in the independent variables such as gender, age-groups, education, marital status, service arm, religion, and ethnicity, have inadequate knowledge of HIV transmission and prevention. However, there was no statistical significance in the analysis except for ethnicity. While a higher proportion of Yoruba and Hausa respondents had good knowledge of HIV prevention compared to those in the Igbo ethnic group. However, we cannot possibly conclude that ethnic belief is a contributing factor to having poor knowledge among these military men because of non-uniformity in the sampling

method. This result might be due to bias. However, there should be interventions to improve knowledge of HIV transmission and prevention especially at the level of education, ethnic groups, and arms of service. These results were supported by a study, which shows that about 24.1% of married military females had poor knowledge of HIV/AIDS [14]. A lower proportion of Igbo respondents (12.5%) compared to 26.3% of Hausa and 35.0% of Yoruba had poor knowledge.

Military personnel in the Navy were about 0.5 times more likely to have heard or seen any information on HIV/AIDS than those in the Army (reference category). This is significant at $p=0.030$ and a 95% confidence interval (CI) of 0.288-0.939. Air-Force personnel was about 1.2 times more likely to have heard or seen any information on HIV/AIDS than the personnel in the Army, though this was, however, not statistically significant at $p<0.05$ and 95% CI. In terms of age group, respondents in the age groups 35–44 years and 45–55 years were respectively about 4.8 times and 6.0 times more likely to have heard or seen any information on HIV/AIDS than those in the age group 18–24 years which is the reference category. These observations were statistically significant at $p<0.05$ and 95% CI. There is also a statistical significance between the marital status of respondents and if they ever heard or saw any information on HIV/AIDS. The married respondents were about 2.0 times more likely to have heard or seen any information on HIV/AIDS than the single respondents ($p=0.015$, 95% CI of 1.954-3.351).

Independent variables such as age group, marital status, and educational level could influence the awareness and knowledge of transmission and prevention of HIV among military men. Though, they are not statistically significant. However, interventions could be focused on a certain group of people in these independent variables. For example, a study pointed out that single female military personnel were more likely to have poor knowledge about HIV transmission and prevention compared to the married respondents [14]. It was also found out that those respondents below 30 years of age had poor knowledge compared to the older respondents.

5. CONCLUSION

The study was able to find a comparatively low level of HIV transmission and prevention among

military personnel in Nigeria. While there was no significant difference in the proportion of those military men that had adequate and inadequate knowledge of HIV transmission, there was a clear and significant difference in the proportion of military men with adequate and inadequate prevention knowledge. The study also found out that independent variables such as age, education, marital status, and service arm are predictive factors that could influence knowledge of HIV transmission and prevention. Planning and implementing strategic interventions would go a long way in improving awareness and knowledge of HIV. These interventions should emphasize promoting education and HIV awareness training among all service arm and all age groups while considering the psychosocial factors and social environments in the Nigerian military.

6. RECOMMENDATIONS

Based on the findings of this study, certain targeted interventions such as HIV seminar and awareness program should be improved among Nigerian army personnel in Nigeria, while other arms should not be neglected. To preserve the lives of military personnel and secure the overall peace and security of the country, knowledge-based promotional activities and awareness should be encouraged among socio-economic and cultural groups in the military. Sexual education and counseling should also be encouraged among all age groups especially the younger officers, marital status, and military ranks.

7. LIMITATIONS

While the study was able to determine the proportion of military personnel with good knowledge of HIV/AIDS transmission and prevention and possibly some socio-economic or demographic factors that might influence the poor knowledge among the respondents, the study could not establish a causal relationship between the dependent and independent variables. However, more studies should be carried out to establish indicators of HIV transmission and prevention knowledge.

CONSENT AND ETHICS APPROVAL

Written approval was collected and preserved from Defense Headquarters, Ministry of Defense, Abuja (DHQ/ABJ/401/17/1/ADM), and Ministry of Defense Health Research Ethics

Committee (MODHREC/APP/004), by the authors. Informed consent was also requested from individual respondents that participated in the research study.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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