**Assessment of cervical cancer screening among women living with HIV/AIDS at Federal Medical Centre Makurdi, Benue State, North Central Nigeria**

*Cervical cancer is the second most common cancer among women of reproductive age and HIV positive women are at a higher risk of developing cervical cancer. Previous studies has shown that cervical cancer screening rates among HIV-positive women are poor, despite the availability and integration of efficient screening techniques as part of the HIVAIDS program. The aim of this study is to access the level of knowledge, awareness, utilization and barriers to accessing cervical cancer screening among HIV positive women. This study was a descriptive cross-sectional study conducted in the ART Clinic of the FMC, Makurdi. A total of 156 HIV positive women between the ages of 15-65 participated in the study. Interviewers guided online questionnaire (google form) was used to collect data. Data was analyzed and presented in tables and chart. The factors affecting uptake of cervical screening among HIV positive women were analyzed using bivariate analysis and logistic regression analysis. Only 4.5% of the study participants were familiar with the term cervical cancer, 93.6% of the study participants had no knowledge of any screening method and 39.7% of the study participants had screened for Cervical Cancer. Only 0.6% of the study participant had taken HPV vaccine. In conclusion, the finding from this study shows that there is poor knowledge of cervical cancer screening methods and uptake of screening among women with HIV. Therefore, there is need for more public awareness creation and education on cervical cancer and screening especially among HIV positive women.*

***Key words: Assessment, Cervical cancer screening, women living with HIV/AIDS, Federal Medical Centre Makurdi, Benue State, North Central Nigeria***

**ASSESSMENT OF CERVICAL CANCER SCREENING AMONG WOMEN LIVING WITH HIV/AIDS AT FEDERAL MEDICAL CENTER MAKURDI, BENUE STATE NORTH CENTRAL NIGERIA.**

**INTRODUCTION**

Cervical cancer remains a major public health burden especially in developing countries despite been preventable with routine screening and treatment of premalignant legions. Cancer of the cervix is the second most common cancer among women and the leading cause of cancer deaths in developing countries 1,2.

Over 500,000 women are diagnosed with invasive uterine cervix cancer each year, and more than 80% of these cases take place in underdeveloped nations 1,2. Most cases present themselves when they are advanced and there are no treatments for cure 1,3. The situation is very different in high-income nations, where effective cervical cancer preventive programs have nearly eliminated the disease 1,4.

Cervical cancer is sexually transmitted with Human papilloma virus been implicated as the causative agent. Other risk factors for the disease include history of multiple sexual partner, prolonged use of combined oral contraceptives, smoking, early sexual intercourse, immunosuppression and HIV/AIDs 3.

HIV infection is responsible for over 5% of all incidences of cervical cancer. The highest burden is in Sub-Saharan Africa (SSA), where more than 71% of women with HIV are at risk of developing cervical cancer 3.

Cervical cancer is a preventable disease due to easy accessibility of the cervix unlike ovarian cancer and the availability of the various primary and secondary preventive measures available. Secondary preventive measures include various screening modalities such as traditional Pap smear, visual inspection with acetic acid & Lugol’s iodine (VIA/VILI), liquid-based cytology (LBC) and HPV testing 4. Despite the availability of these screening methods the level of utilization is very poor especially among women living with HIV/AIDS this statement has been collaborated with some studies 5,6.

The integration of cervical cancer screening as a standard of care within HIV programs was advised by the new Nigerian National HIV treatment guidelines, which acknowledged the potential benefit of cervical cancer prevention in HIV-infected women 7.8. Unfortunately, most HIV clinics have not yet implemented this crucial proposal, either due to a lack of motivation or out of concern for the success of the successful HIV services 1,9,10,11.

One of the published studies from Nigeria on cervical cancer screening among women with HIV indicated a 96.0% "willingness to screen" in the future 12. Additionally, different refusal rates ranging from 12 to 87% of cervical cancer screening have been reported from other countries with high burden of HIV13-17. Therefore, from the above literature, there is a need for further study to assess the current level of knowledge, awareness, and utilization of cervical cancer screening among women living with HIV/AIDS to guide public health practitioners to formulate policies that will improve on the availability and accessibility of the different cervical screening modalities that will help in the prevention and early diagnosis of pre-invasive legions and early stage disease thereby reducing the burden of cervical cancer especially in women with HIV/AIDS.

The purpose of the study is to access the level of knowledge, awareness, utilization and barriers to accessing cervical cancer screening among women living with HIV/AIDS.

**PROBLEM STATEMENT**

The biggest cause of cancer-related fatalities in women worldwide is cervical cancer, Due to their weakened immune systems HIV positive women are more susceptible to HPV persistence and rapid disease progression. Some studies has shown that cervical cancer screening rates among HIV-positive women are poor, despite the availability of efficient screening techniques such as Pap smears, HPV testing, Visual Inspection with Acetic Acid (VIA)/Visual Inspection with Lugol’s Iodine (VILI)) 4-6. This may be due to limited access to healthcare services, stigma, ignorance, and attitudes among healthcare providers. To reduce the burden of cervical cancer among women who are HIV-positive and with the integration of cervical cancer screening as part of HIV care for HIV positive women, there is need for more studies to assess the knowledge…………

**LITERATURE REVIEW.**

The discrepancies in cervical cancer screening rates between HIV-positive and HIV-negative women have been investigated in numerous studies. These studies constantly show that women who are HIV-positive are less likely to go for routine screening, which can delay diagnosis and increase mortality rates. Insufficient access to healthcare facilities, worry about discrimination and stigma, ignorance of cervical cancer, and insufficient training of healthcare professionals in handling both HIV and cervical cancer are among the barriers to screening that have been noted in the literature.

Additionally, research highlights the significance of incorporating cervical cancer screening into HIV treatment programs to enhance overall health outcomes. By removing obstacles and offering comprehensive care that targets both HIV and cervical cancer, cooperative efforts have the potential to raise screening rates.

**JUSTIFICATION.**

The evaluation of cervical cancer screening procedures among HIV positive women is important from a clinical and public health perspective. Researchers can suggest focused interventions to increase screening rates by pinpointing the obstacles these communities face in getting access to routine screening. Additionally, through incorporation of cervical cancer screening into current HIV care programs, healthcare resources might be used more effectively, patient outcomes could be improved, and the burden of cervical cancer-related morbidity and mortality could be lessened.

Designing practical solutions to the particular problems this group of women faces requires an understanding of the factors impacting cervical cancer screening practices among HIV-positive women. Closing this knowledge gap could result in better cervical cancer prevention and management outcomes for women with HIV/AIDS by raising awareness, eliminating stigma, improving provider training, and increasing access to screening services, and more.

**RESEARCH QUESTION**

1. What is the level of knowledge, awareness and utilization of cervical cancer screening among HIV positive women?
2. Are they barriers to uptake of cervical cancer screening among HIV positive women?

**HYPOTHESIS**

**NULL HYPOTHESIS:**

There are no barriers to cervical cancer screening uptake among women living with HIV/AIDS.

**ALTERNATE HYPOTHESIS:**

There are barriers to cervical cancer screening uptake among women living with HIV/AIDS.

**AIM**

To assess the level of knowledge, awareness, utilization and barriers or factors to cervical cancer screening among women living with HIV/AIDS.

**OBJECTIVES**

1. To determine the proportion of women living with HIV/AIDS who have undergone cervical cancer screening.
2. To assess the level of knowledge and awareness of cervical cancer screening among women living with HIV/AIDS.
3. To determine the proportion of HPV vaccination among women living with HIV/AIDS.
4. To determine the barriers to accessibility of cervical cancer screening among women living with HIV/AIDS.

**MATERIALS AND METHODS:**

**Study Design**

This was a descriptive cross sectional study that was conducted in the Anti-retroviral Clinic (ART) of the Federal Medical Center (FMC) in Makurdi North Central Nigeria, to access the level of knowledge, awareness, utilization and barriers or factors to accessing cervical cancer screening among women living with HIV/AIDS between the ages of 15-65 years of age.

**Study Setting**

This study was conducted in the ART Clinic of the Federal Medical Centre Makurdi, Benue State, North Central. The health facility is mainly for the diagnosis and treatment of disease of public health importance such as Mycobacterium Tuberculosis, prevention of mother to child transmission of HIV/AIDS (PMTCT), counselling and testing, laboratory services such as CD4 count, Craig test, viral load, dried blood spot test (DBS) and cervical cancer screening and treatment of pre-malignant legions using see and treat intervention among other supporting treatment and investigations. Federal Medical Center also offers other specialized services and serves as a referral center for hospitals in Benue and other neighboring states. Other cervical cancer screening facilities for women with HIV in Benue State includes the Benue State University Teaching Hospital (BSUTH), General Hospital Makurdi (GHMKD), Bishop Murray Medical Center (BMMC) many others.

**Eligible Criteria**

**Inclusion Criteria**

This was HIV-positive women aged between 15 and 65 years that were eligible to participate in the study.

**Exclusion criteria**

* Women with HIV who had undergone total hysterectomy
* Women with HIV with established cervical cancer
* Women with HIV who decline consent

**INFORMED CONSENT PROCESS**

Women were selected from the sample frame by research assistants as part of the informed consent process before signing the consent form, the participants were also guaranteed that their information would be kept confidential. The study questionnaires were administered thereafter.

**Sample Size Determination**

The sample size was determined using the sample size formula for prevalence study,

n Z2P(1-P)/d2

Where,

n Minimum sample size,

Z Standard normal variate (at 5% type I error, P< 0.05) = 1.96

P Prevalence of previous Cervical Cancer (CC) Screening of WLHIV 56.2 % by Oliver et al in Lagos State, Nigeria.

9.4% / 100 = 0.562

1-P 0.094= 0.906

dPrecision 0.05

Therefore, n 1.962x 0.094x0.906/ (0.05)2 131

Using a non-response rate of 10%, N 146

**Sampling Technique**

The study participants were recruited consecutively (convenient non probability sampling method) until the sample size is achieved using interviewers administered online google form.

**Study Period**

This was between July and August, 2023.

**Data Collection**

A structured online interviewer's questionnaire (Google form) was used to collect data and the data collection was also aided by an interpreter in Benue State local languages (Tiv, Idoma, and Igede). The researcher interviewed each participant to obtain information on socio-demographic characteristics, knowledge, awareness, utilization and barriers to accessibility of Cervical Cancer (CC) screening.

**Method of Data Analysis**

Data was analyzed using Statistical Package for Social Science (SPSS) version 23.0, descriptive statistics was generated for each study variable including frequencies and percentage for categorical variables, mean and standard deviation for continuous variables. The prevalence of cervical cancer screening was represented on a pie chart. Chi-square was used to test association between socio-demographic variables, knowledge, awareness and dependent variables (utilization of cervical cancer screening). Fisher’s exact test was reported when more than 20% of cells have expected counts less than five (5). Multivariable logistic regression analysis was performed to identify socio-demographic, knowledge and awareness predicting utilization of cervical cancer screening. Variables associated with a p-value <0.10 in bivariate analyses were considered eligible for inclusion in multiple logistic regression analyses. Adjusted odds ratio estimated from logistic regression, together with 95% confidence interval (CI) also measured the strength of association. Level of statistical significance was set at p-value of < 0.05 in all analysis.

**RESULTS**

**4.1 Socio-demographic and clinical characteristics of participants**

Table 1 shows socio-demographic characteristics of participants. The age range of participants was 21 to 63 years. The mean age was 39.56±8.40 years. Participants aged 31-40 years had the highest frequency (n=66, 42.3%). Above two-third (n=107, 68.6%) of the participants were married and the least was observed in participants who were separated (n=5, 3.2%). Almost all the participants (n= 147, 94.2%) were Tiv and the least was seen in participants who were Hausa and Igbo (n=1, 0.6%) respectively. Above one-third (n=62, 39.7%) of the participants had secondary education and the least were those who had primary education (n=19, 12.2%). Slightly above two-third (n=106, 67.9%) of participants had income between 50,000-100,000 and the least of participants had 200,000 and above. Almost all the participants (n=153, 98.1%) were on ART for 2 years and above. A vast majority (n=155, 99.4%) are Christians. A higher frequency (n=99, 63.5%) had pregnancies from 3 and above. Most of the participants (n=102, 65.4%) had history of opportunistic infection and the estimated time to the health facility’s (n=80, 51.3%) 1hour and above.

**Table 1: Socio-demographic and clinical characteristics of participants (N=156)**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequency** | **Percent** |
| **Age** |  |  |
| 21-30 | 25 | 16.0 |
| 31-40 | 66 | 42.3 |
| 41-50 | 51 | 32.7 |
| >50 | 14 | 9.0 |
| **Mean=39.5±8.40** |  |  |
| **Marital status** |  |  |
| Single | 22 | 14.1 |
| Cohabiting | 9 | 5.8 |
| Married | 107 | 68.6 |
| Separated | 5 | 3.2 |
| Widow | 13 | 8.3 |
| **Tribe** |  |  |
| Tiv | 147 | 94.2 |
| Idoma | 5 | 1.3 |
| Igede | 2 | 3.2 |
| Hausa | 1 | 0.6 |
| Igbo | 1 | 0.6 |
| **Educational level** |  |  |
| Primary | 19 | 12.2 |
| Secondary | 62 | 39.7 |
| Tertiary | 43 | 27.6 |
| Never attended school | 32 | 20.5 |
| **Occupation** |  |  |
| Civil Servant | 16 | 10.3 |
| NGO | 4 | 2.6 |
| Business | 56 | 35.9 |
| Farmers | 52 | 33.3 |
| Nothing at the moment | 28 | 17.9 |
| **Level of income** |  |  |
| 50,000-100,000 | 106 | 67.9 |
| 101,000-150,000 | 7 | 4.5 |
| 200,000 and above | 3 | 1.9 |
| Nothing at the moment | 40 | 25.6 |
| **Duration on ART** |  |  |
| 1 month - 3 months | 1 | 0.6 |
| 4months - 6 months | 1 | 0.6 |
| 7 months - 1 year | 1 | 0.6 |
| 2 years and above | 153 | 98.1 |
| **Religion** |  |  |
| Christianity | 155 | 99.4 |
| Muslim | 1 | .6 |
| **Total number pregnancies ever delivered** |  |  |
| 1 | 13 | 8.3 |
| 2 | 25 | 16.0 |
| 3 and above | 99 | 63.5 |
| Non | 19 | 12.2 |
| **History of opportunistic infection** |  |  |
| Yes | 102 | 65.4 |
| No | 54 | 34.6 |
| **Estimated time to the health facility** |  |  |
| 10-30min | 32 | 20.5 |
| 31min - 1hr | 44 | 28.2 |
| 1hr and above | 80 | 51.3 |

**4.2 knowledge, awareness and utilization of cervical cancer screening**

Table 2 shows knowledge awareness and utilization of cervical cancer screening. Above half (n=83, 53.2%) participants were not familiar with the term cervical cancer. Majority of (n=138, 88.5%) participants were not aware that women with HIV/AIDS are at a higher risk of developing cervical cancer. A greater percentage (n=146, 93.6%) had no idea of any screening methods. Regarding screening for cervical cancer, (n=94, 60.3%) of the participants have never been screened for cervical cancer, while (n=62, 39.7%) had cervical cancer screening, giving a prevalence of cervical cancer screening of 39.7%. Out of the 62 participants that had cervical cancer screening, Half, (n=31, 50%) of the participants had their first screening at the age of 40 years and above; majority (n=46, 74.2%) of the participants did not know the different screening methods used and were not sure of how often they undergo cervical cancer screening respectively. Majority (n=154, 98.7%) of the participants have never had an abnormal screening result, while (n=2, 1.3%) who have had an abnormal screening result also received appropriate follow-up and treatment.

**Table 2: Knowledge, awareness and utilization of cervical cancer screening among participants (N=156)**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequency** | **Percent** |
| **How familiar are you with the term "cervical cancer"** |  |  |
| Familiar | 7 | 4.5 |
| Not familiar | 149 | 95.5 |
| **Are you aware that women with HIV/AIDS are at a higher risk of developing cervical cancer** |  |  |
| Yes‎ | 18 | 11.5 |
| No | 138 | 88.5 |
| **Do you know any screening methods** |  |  |
| Yes‎ | 10 | 6.4 |
| No | 146 | 93.6 |
| **Ever undergone cervical cancer screening** |  |  |
| Yes | 62 | 39.7 |
| No | 94 | 60.3 |
| **At what age did you have your first screening (n=62)** |  |  |
| Less than 21 years | 1 | 1.6 |
| 21-29 years | 10 | 16.1 |
| 30-39 years | 20 | 32.3 |
| 40 years and above | 31 | 50.0 |
| **Which screening method(s) have you used (n=62)** |  |  |
| Both Pap smear and HPV testing | 1 | 1.6 |
| VIA/VILI | 15 | 24.2 |
| Don’t know | 46 | 74.2 |
| **How often do you undergo cervical cancer screening (n=62)** |  |  |
| Annually | 12 | 19.3 |
| Every 2 years | 4 | 6.5 |
| Not sure/Not applicable | 46 | 74.2 |
| **Have you ever received an abnormal screening result** |  |  |
| Yes | 2 | 1.3 |
| No | 154 | 98.7 |
| **If yes, did you receive appropriate follow-up and treatment** |  |  |
| Yes | 2 | 1.3 |
| No | 154 | 98.7 |

**4.3 HPV vaccination among the study participants**

Table 3 shows HPV vaccination among participants. Almost all the participants (n=155, 99.4%) have not received HPV vaccine, and the only participants who received HPV vaccine took it at the age of 40 years and above.

**Table 3: HPV vaccination among the study participants (N=156)**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequency** | **Percent** |
| **Have you received the HPV vaccine** |  |  |
| Yes | 1 | 0.6 |
| No | 155 | 99.4 |
| **If yes, the age at which you received the vaccine (n=1)** |  |  |
| 40 years old and above | 1 | 100.0 |

* 1. **Factors affecting cervical cancer screening**

Table 4 shows the factors affecting cervical cancer screening. Majority (n=86, 91.5%) of the participant had lack of awareness about cervical cancer screening.

**Table 4: Factors that prevented participants from getting screened (N=94)**

|  |  |  |
| --- | --- | --- |
| **Variables** | **Frequency** | **Percent** |
| **What factors, if any, have prevented you from getting screened for cervical cancer** |  |  |
| Lack of awareness about screening | 86 | 91.5 |
| Fear of the screening procedure | 4 | 4.3 |
| Lack of access to health care services | 2 | 2.1 |
| Fear of cervical cancer screening | 2 | 2.1 |

* 1. **Association between socio-demographic, clinical characteristics and cervical cancer screening**

Table 5 and 6 shows association between socio-demographic, clinical characteristics and cervical cancer screening. Cervical cancer was prevalent among those who were age >50 years (n=8, 57.1%), while the least was observed among those who were age 31-40 years (n=17, 25.8%). This was statistically significant (p=0.017).

Marital status showed that widow participants had the highest prevalence of cervical cancer screening (n=8, 61.5%), while the least prevalence was observed in those who were Cohabiting (n=3, 33.3%). This was not statistically significant (p=0.312).

Concerning tribe, Idoma, Igede and Igbo participants had the highest prevalence of cervical cancer screening (n=5, 100%), (n=2, 100%) and (n=1, 100%) respectively. This was statistically significant. (p=0.001).

According to level of education, participants with primary education had the highest prevalence cervical cancer (n=11, 57.9%), while the least prevalence was seen in those with never attended school (n=8, 25%). This was not statistically significant (p=0.083).

NGO participants had the highest prevalence of Cervical cancer (n=3, 75%) and the least was seen in those who were farmers (n=14, 26.9%) This was statistically significant (p=0.023).

Regarding level of income, participants without income (nothing at the moment) had the highest prevalence of cervical cancer screening (n=23, 57.5%), while the least prevalence was observed in those who had income 200,000 and above (n=1, 33.3%). This was statistically significant (p=0.019).

Participants who were on ART for 2 years and above had the highest prevalence of cervical cancer screening (n=62, 40.5%) This was not statistically significant (p=1.000).

Participants who were Muslim had the highest prevalence of cervical cancer screening when compared to those who were Christians and this was not statistically significant (100% vs 39.4%, p=0.217).

Concerning total number of pregnancies ever delivered, participants who had none deliveries had higher prevalence of cervical cancer (n=11, 57.9%) while the least prevalence was observed among those who delivered once (n=3, 23.1%). This was not statistically significant (p=0.202).

In terms of history of opportunistic infection, participants who did not have history of opportunistic information had higher prevalence of cervical cancer screening when compared to those who had history of opportunistic infection and this was not statistically significant (44.4% vs 37.3%, p=0.383).

Regarding estimated time of participants to the health facility, participants who spent 1 hour and above had highest prevalence of cervical cancer screening (n=33, 41.3%), while the least was observed among participants who spent 10-30 mins (n=11, 34.40%). However, this was not statistically significant (p=0.748).

**Table 5: Association between socio-demographic, clinical characteristics and cervical cancer screening**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Cervical cancer screening** | | **Test statistics** | **Df** | **p-value** |
| **Yes**  **n(%)**  **n=62** | **No**  **n(%)**  **n=94** |
| **Age** |  |  | Fisher’s exact=10.03 |  | 0.017\* |
| 21-30 | 13(52.0) | 12(48.0) |  |  |  |
| 31-40 | 17(25.8) | 49(74.2) |  |  |  |
| 41-50 | 24(47.1) | 27(52.9) |  |  |  |
| >50 | 8(57.1) | 6(42.9) |  |  |  |
| **Marital status** |  |  | Fisher’s exact=4.74 |  | 0.312 |
| Single | 10(45.5) | 12(54.5) |  |  |  |
| Cohabiting | 3(33.3) | 6(66.7) |  |  |  |
| Married | 38(35.5) | 69(64.5) |  |  |  |
| Separated | 3(60.0) | 2(40.0) |  |  |  |
| Widow | 8(61.5) | 5(38.5) |  |  |  |
| **Tribe** |  |  | Fisher’s exact=12.37 |  | 0.001\* |
| Tiv | 54(36.7) | 93(63.3) |  |  |  |
| Idoma | 5(100.0) | 0(0.0) |  |  |  |
| Igede | 2(100.0) | 0(0.0) |  |  |  |
| Hausa | 0(0.0) | 1(100.0) |  |  |  |
| Igbo | 1(100.0) | 0(0.0) |  |  |  |
| **Educational level** |  |  | Fisher’s exact=6.63 |  | 0.083 |
| Primary | 11(57.9) | 8(42.1) |  |  |  |
| Secondary | 28(45.2) | 34(54.8) |  |  |  |
| Tertiary | 15(34.9) | 28(65.1) |  |  |  |
| Never attended school | 8(25.0) | 24(75.0) |  |  |  |
| **Occupation** |  |  | Fisher’s exact=10.83 |  | 0.023\* |
| Civil Servant | 7(43.8) | 9(56.3) |  |  |  |
| NGO | 3(75.0) | 1(25.0) |  |  |  |
| Business | 21(37.5) | 35(62.5) |  |  |  |
| Farmers | 14(26.9) | 38(73.1) |  |  |  |
| Nothing at the moment | 17(60.7) | 11(39.3) |  |  |  |
| **Level of income** |  |  | Fisher’s exact=8.85 |  | 0.019\* |
| 50,000-100,000 | 34(32.1) | 72(67.9) |  |  |  |
| 101,000-150,000 | 4(57.1) | 3(42.9) |  |  |  |
| 200,000 and above | 1(33.3) | 2(66.7) |  |  |  |
| Nothing at the moment | 23(57.5) | 17(42.5) |  |  |  |
| **Duration on ART** |  |  | Fisher’s exact=1.85 |  | 1.000 |
| 1 month - 3 months | 0(0.0) | 1(100.0) |  |  |  |
| 4months - 6 months | 0(0.0) | 1(100.0) |  |  |  |
| 7 months - 1 year | 0(0.0) | 1(100.0) |  |  |  |
| 2 years and above | 62(40.5) | 91(59.5) |  |  |  |

*\*= statistically significant*

**Table 6: Association between socio-demographic, clinical characteristics and cervical cancer screening continued**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Cervical cancer screening** | | **Test statistics** | **Df** | **p-value** |
| **Yes**  **n(%)**  **n=62** | **No**  **n(%)**  **n=94** |
| **Religion** |  |  | χ2=1.52 | 1 | 0.217 |
| Christianity | 61(39.4) | 94(60.6) |  |  |  |
| Muslim | 1(100.0) | 0(0.0) |  |  |  |
| **Total number pregnancies ever delivered** |  |  | Fisher’s exact=4.56 |  | 0.202 |
| 1 | 3(23.1) | 10(76.9) |  |  |  |
| 2 | 8(32.0) | 17(68.0) |  |  |  |
| 3 and above | 40(40.4) | 59(59.6) |  |  |  |
| None | 11(57.9) | 8(42.1) |  |  |  |
| **History of opportunistic infection** |  |  | χ2=0.76 | 1 | 0.383 |
| Yes | 38(37.3) | 64(62.7) |  |  |  |
| No | 24(44.4) | 30(55.6) |  |  |  |
| **Estimated time to the health facility** |  |  | Fisher’s exact=0.48 |  | 0.748 |
| 10-30min | 11(34.40 | 21(65.6) |  |  |  |
| 31min - 1hr | 18(40.9) | 26(59.1) |  |  |  |
| 1hr and above | 33(41.3) | 47(58.8) |  |  |  |

* 1. **Association between knowledge, awareness and cervical cancer screening**

Table 7 shows association between knowledge, awareness and cervical cancer screening. Participants who were very familiar with the term cervical cancer had the highest prevalence of cervical cancer (n=6, 85.7%), while the least was observed among participant who were not familiar with the term cervical cancer (n=56, 37.6%). This was statistically significant (p<0.001).

Participants who were aware that women with HIV/AIDS are at a higher risk of developing cervical cancer had the highest prevalence when compared with those who were not aware and this was statistically significant (83.3% vs 34.1%) This was statistically significant (p<0.001).

Participants who knew cervical cancer screening methods had the highest prevalence when compared with those who did not and this was statistically significant (100% vs 35.6%) This was statistically significant (p<0.001).

Participants who ever received an abnormal screening result had a highest prevalence of cervical cancer screening when compared with those who did not (100% vs 39.0%). Though, this was not statistically significant (p=0.080).

Concerning HPV vaccination, participants who have not received HPV vaccine had highest prevalence when compared to those who have vaccinated (40% vs 0%). However, this was not statistically significant (p=0.415).

**Table 7: Association between knowledge, awareness and cervical cancer screening**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Cervical cancer screening** | | **Test statistics** | **df** | **p-value** |
| **Yes**  **n(%)**  **n=62** | **No**  **n(%)**  **n=94** |
| **How familiar are you with the term "cervical cancer"** |  |  | χ2=16.14 |  | <0.001\* |
| Very familiar | 6(85.7) | 1(14.3) |  |  |  |
| Not familiar at all | 56(37.6) | 93(62.4) |  |  |  |
| **Are you aware that women with HIV/AIDS are at a higher risk of developing cervical cancer** |  |  | χ2=16.14 | 1 | <0.001\* |
| Yes‎ | 15(83.3) | 3(16.7) |  |  |  |
| No | 47(34.1) | 91(65.9) |  |  |  |
| **Do you know any screening methods** |  |  | χ2=16.20 | 1 | <0.001\* |
| Yes‎ | 10(100.0) | 0(0.0) |  |  |  |
| No | 52(35.6) | 94(64.4) |  |  |  |
| **Have you ever received an abnormal screening result** |  |  | χ2=3.07 | 1 | 0.080 |
| Yes | 2(100.0) | 0(0.0) |  |  |  |
| No | 60(39.0) | 94(61.0) |  |  |  |
| **Have you received the HPV vaccine** |  |  | χ2=0.66 | 1 | 0.415 |
| Yes | 0(0.0) | 1(100.0) |  |  |  |
| No | 62(40.0) | 93(60.0) |  |  |  |

* 1. **Logistic regression model of independent variables predicting cervical cancer screening**

A logistic regression was performed to ascertain the effects of age, educational level, occupation, and level of income, familiarity with the term cervical cancer, being aware that HIV/AIDS is a risk factor for cervical cancer among women with HIV, knowing methods of cervical cancer screening and abnormal cervical cancer results on the likelihood that participants would screen for cervical cancer. Variables that were eligible to be entered into the logistic regression model were those that were significant at 0.1% on bivariate analysis. Other variables that were eligible for logistic regression but had contributed to the model not to be good were excluded. The logistic regression model was statistically significant, (χ2(18)= 53.702, *p* <0.001) (Omnibus test). The model explained 3.94% (Nagelkerke *R2*) of the variance in cervical cancer screening and correctly classified 78.2% of cases.

Participants who were age 31-40, >50 years, level of income between 101,000-150,000, those who were aware that women with HIV/AIDS are at a higher risk of developing cervical cancer and those who knew cervical cancer screening methods were 2.20, 3.84, 3.12, 1.61, 2.80, 3.62, 1.40, 13.26, 4.85 and 516469144392289.500 times more likely to screen for cervical cancer. However, these were not statistically significant (p>0.05) respectively.

Conversely, participants who were age 31-40 educational level: primary, secondary, Tertiary; occupation: Civil servant, NGO, Business, Farmers; income 50,000-100,000, 200,000 and above and received abnormal results were 0.98, 0.26, 0.54, 0.18, 0.83, 0.00 and 0.00 times less likely to have cervical cancer screening. Though, these were not statistically significant (p>0.05) respectively.

**Table 8: Logistic regression showing independent prediction of cervical cancer screening**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **Adjusted odds ratio**  **(aOR)** | **95% confidence interval**  **(CI)** | **p-value** |
| **Age** |  |  |  |
| 21-30 | Reference |  |  |
| 31-40 | 0.98 | 0.25 – 3.92 | 0.981 |
| 41-50 | 2.20 | 0.56 – 8.57 | 0.256 |
| >50 | 3.84 | 0.07 – 19.17 | 0.101 |
| **Educational level** |  |  |  |
| Primary | 3.12 | 0.78 – 12.45 | 0.108 |
| Secondary | 1.61 | 0.55 – 4.66 | 0.382 |
| Tertiary | 0.26 | 0.06 – 1.17 | 0.080 |
| Never attended school | Reference |  |  |
| **Occupation** |  |  |  |
| Civil Servant | 0.54 | 0.06 – 4.79 | 0.540 |
| NGO | 2.80 | 0.12 – 64.05 | 2.803 |
| Business | 3.62 | 0.58 – 2.24 | 0362 |
| Farmers | 0.18 | 0.03 – 1.12 | 0.180 |
| Nothing at the moment | Reference |  |  |
| **Level of income** |  |  |  |
| 50,000-100,000 | 0.83 | 0. 19– 3.65 | 0.802 |
| 101,000-150,000 | 1.40 | 0.13 – 14.60 | 0.778 |
| 200,000 and above | 0.00 | - | 0.999 |
| Nothing at the moment | Reference |  |  |
| **How familiar are you with the term "cervical cancer"** |  |  |  |
| Very familiar | 13.26 | 0.40 – 441.17 | 0.148 |
| Not familiar at all | Reference |  |  |
| **Are you aware that women with HIV/AIDS are at a higher risk of developing cervical cancer** |  |  |  |
| Yes‎ | 4.85 | 0.86 – 27.33 | 0.074 |
| No | Reference | - |  |
| **Do you know any screening methods** |  |  |  |
| Yes‎ | 516469144392289.500 | - | 0.998 |
| No | Reference |  |  |
| **Have you ever received an abnormal screening result** |  |  |  |
| Yes | 0.00 | - | 1.000 |
| No | Reference |  |  |

**Note:** \*p<0.05, Omnibus test=53.702, P<0.001; Hosmer-Lemeshow goodness of fit test: χ2 = 8.792, df = 7, p =0.268, Nagelkerke R2=0.394

**DISCUSSION**

This index study assessed the knowledge, awareness and utilization of cervical cancer screening among women living with HIV/AIDS. Only 4.5% of the study participants were familiar with the term cervical cancer (CC) and majority (88.5%) of the study participants were not aware that HIV/AIDS is a risk factor for cervical cancer. This was similar to the quasi-experimental community study by Wright et al in Lagos who similarly found low level of knowledge of 15% and 6.9% among the intervention and control group respectively 15. Although their study was a population base study comprising of women from two markets. Similar Dim et al in their study found about 22% of the study population living with HIV/AIDS who were aware of cervical cancer11. This low level of knowledge of cervical cancer was similarly found in studies conducted in Ethiopia among women living with HIV/AIDS by Ekru et al and Belete et al who reported a level of knowledge of 21.5% and 34.2% respectively22, 23. However, Ezechi et al reported a moderate level of knowledge of cervical cancer (56.2%) in their study among HIV positive Nigerian women compared to this index study 24. This difference may be due to the metropolitan nature of Lagos their study location with high level of education and public health enlightenment with resultant better health seeking behavior compared to Makurdi, Benue State, and North Central Nigeria. In addition, the sample size was 1517 respondents which was larger than this index study. Also, previous study by Utoo et al reported a high awareness of cervical cancer at 65% 25. This high level of awareness may due to the high level of education among the study participants (post-secondary, 64.5%) and it was among women attending outpatient gynecological clinic in tertiary institution on this current study, in the study was among women attending ART Clinic and majority had only secondary education (39.7%). However, there is generally a poor knowledge of cervical cancer and its risk factors especially among women living with HIV/AIDS and generally among the populace in Nigeria and Sub-Saharan Africa. Therefore, a lot needs to be done among the stakeholders in various communities in Nigeria to create public health education on cervical cancer and its risk factors, educating the people living with HIV/AIDS especially been that women with HIV positive are at a risk for cervical cancer among others.

More (93.6%) of the study participants had no knowledge of any screening method in this study. This finding was different from the study conducted by Utoo et al who reported modest level of awareness (51%) of cervical cancer screening 25. This difference may probably be due to the differences in the study population and educational level of the study participants.

Sixty two of the study participants (39.7%) had undergone cervical cancer screening, of which most of them between the age 40 years and above (50%) and majority of the study participants didn’t know the type of cervical cancer screening method that was done for them (74.2%). Most (74.2%) were not sure of how often they undergo cervical screening. Only 2(1.3%) of the study participants had abnormal Pap smear and follow-up was done by the healthcare provider. This differ from other similar study by Ezechi et al who reported 9.4% of previous screening 24. This difference may be due to the recent integration of cervical cancer screening and treatment into the HIV/AIDS program in Nigeria 25. This also differs from the study by Utoo et al who reported a low proportion (13.6%) of utilization of cervical cancer screening 26.

Among the study participants only 1(0.6%) within the age group 40 years and above received the HPV vaccine. This poor uptake of HPV vaccines was similarly reported by Ezeanochie et al (0.5%) and Rabiu et al (0%) 27, 28. among female secondary school students in Benin City, South South Nigeria and Kano, North west Nigeria respectively. This poor uptake of HPV was attributed to poor knowledge, awareness, acceptance, availability, accessibility as well as cost of the vaccines in Nigeria as reported from several studies 27-30. Therefore, there is need for public advocacy, awareness and education among stakeholders and members of various communities across Nigeria. HPV vaccination should be integrated into the HIV/AIDS programme and into the National programme for immunization for adolescent of both sexes and those adults who screen negative for premalignant lesions of the cervix. There should be a screening and vaccination schedule for all women of reproductive age for cervical cancer and HPV vaccination as a national policy.

On assessment of factors affecting the uptake of cervical cancer screening among HIV positive women, bivariate analysis using socio-demographic and clinical factors, knowledge and awareness of the study participants. Only age, tribe, occupation, level of income, knowledge of cervical cancer, awareness of HIV/AIDS as risk for cervical cancer, knowledge of cervical cancer screening method was statistically significant (p<0.05). However, on further analysis using logistic model none of these variables were significantly associated with cervical screening uptake. This finding was not in keeping with other studies. Ezechi et al in their study found tertiary education, no living child, and recent HIV diagnosis and being aware of cervical cancer as the factors associated with acceptance to screening 24. In another similar study, Erku et al identified age between 21-29 years old, perceived susceptibility to develop cervical cancer and comprehensive knowledge of cervical cancer as strong predictors of cervical cancer screening up take among HIV positive women 22. Also, Belete et al found educational level, source of information, awareness for the test and preventability of the disease as factor significantly associated with cervical cancer screening acceptance 23. This difference may be probably due to the larger sample used in these studies as compared to this current study. From this analysis, there should be more advocacy visits by public health stakeholders to community leaders and communities as well. Policy makers to create public awareness on the availability and accessibility of cervical cancer screening methods in both public and private health facilities in the communities to help curb cervical cancer.

Conclusion

This current study found that there is poor knowledge of cervical cancer and awareness of HIV/AIDS as a risk factor for cervical cancer among HIV positive women. Majority (93.6%) do not have knowledge of the different types of cervical cancer screening methods. Only 39.7% have ever had cervical cancer screening and 0.6 % of the study participants received HPV vaccine. However, this study found no associated factors affecting the uptake of cervical cancer screening among HIV positive women unlike previous studies, this may be due to smaller sample size used in this index study.

The study recommends more awareness creation on the availability and accessibility of various screening modalities especially among HIV positive women and advocates the integration of HPV vaccination as part of treatment for HIV positive women. Secondly, the need for further studies using a larger population size and multiple centers.

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