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Research Article

Risk Perception of Cervical Cancer among HIV Infected and Uninfected Women Attending Bingham University Teaching Hospital, Plateau State

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Abstract

Background: Cervical cancer is the fourth most common cancer in women worldwide and the second most common cancer in less developed countries, with an estimated 570,000 new cases in 2018. In Nigeria, cervical cancer is a significant cause of morbidity and mortality among women. The study aimed to determine and compare the risk perception among HIV-infected and uninfected women.

Materials and Methods: This was a comparative cross-sectional study conducted in Bingham University Teaching Hospital Jos between April to June 2021. One hundred and twenty-four HIV-infected and uninfected women who met inclusion criteria were selected using the convenience sampling technique. A standardized and validated questionnaire adapted from Champion HBM was used to collect information. A Chi-square test was used to assess the difference between groups and to determine factors associated with risk perception. Multiple logistic regressions at a 5% level of significance was used to determine predictors. Statistical analysis was carried out using SPSS version 23.0.

Results: The mean age of respondents in the HIV-infected group was 37.54 ± 7.52 years and 31.23 ± 5.85 years for the uninfected group. The cervical cancer risk perception health belief model constructs were not statistically significantly different between the HIV infected and uninfected in all constructs (susceptibility (p=0.809) seriousness (p=1.000), benefit (p=0.898), barrier (p=0.586) except for self-efficacy construct (p=0.028, In the HIV-infected, respondents with tertiary level of education, had 8 times odds of good knowledge of cervical cancer compared to those with no education and this was statistically significant (OR=8.23, CI: 2.41-28.13, p=0.001). Those aged group 35 to 44 years, had 10 times the odds of good risk perception compared to those aged 15 to 24 years (OR=10.00, CI: 2.23-44.8; p=0.003).

Conclusion: This study has shown that risk perception was low among HIV-infected and uninfected women. There is a need for interventions targeted at improving knowledge and risk perception among women and introducing cervical cancer vaccination programs in Nigeria.

Keywords: Risk Perception; HIV; Screening

Introduction

Cervical cancer is the fourth commonest cancer in women worldwide and the second most commonest cancer in less developed countries, with an estimated 570,000 new cases (84% of the new cases worldwide) in 2018 representing 7.5% of all female cancers [1,2]. In West Africa, there were 31,955 new cases of cervical cancer and 23,529 cervical cancer deaths in 2018. This was second to East Africa [3]. In Nigeria, there were 53.1 million women at risk for cervical cancer (≥ 15 years) in 2018. The annual number of new cervical cancer cases was 14,943 (15.07%) with 10,403 (17.19%) cancer deaths and a 5-year prevalence of 14.03% in 2018 [3]. HIV-infected women have an increased risk of developing cervical cancer and faster disease progression in comparison with their HIV-uninfected counterparts [4-7]. In Nigeria, various studies have highlighted a higher prevalence of premalignant cervical lesions (16.4% to 56.3%) among HIV-infected women compared to their uninfected counterparts (12.6% to 16.4%) [8-10].

If preventive measures are not put in place, cervical cancer deaths will rise by almost 50% by 2040, undermining health gains for women.

Several studies have highlighted a poor uptake of Pap smear in developing countries compared to developed countries [11-15]. It has also been found that a poor risk perception contributes significantly among other things to the poor uptake of Pap smear tests. In a systematic review in Africa, most of the women living with HIV lacked a clear understanding of the risks of cervical cancer associated with HIV and HPV co-infections. They had mixed and often contradictory risk perceptions of susceptibility to cervical cancer [15]. Some felt that they were more susceptible to cervical cancer because they had weak immune systems. Others did not perceive themselves to be at risk until they perceived symptoms, had a family history, or were sexually active [16]. It is therefore not surprising that in Africa where screening rates are very low, the majority of women present at late stages with invasive and advanced disease [15].

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Cervical cancer screening has the benefit to reduce the incidence, the progression of the advanced stage of cancer as well as its mortality [17]. This is especially so for HIV-infected women who are at a greater risk of being infected with HPV and early progression to cancer [17,18]. One of the goals in the Nigeria National Cancer Control Plan 2018 to 2022 is "To achieve greater than 50% screening of eligible population by 2022 in Nigeria". This goal can be achieved by improving the risk perception and uptake of Pap smear in the female population.

This study aims to further enhance ongoing effort, especially in the light of prevailing sexually transmissible viral factors, like Human papilloma virus infection, and to determine the differences between HIV-infected and HIV-uninfected persons. Increasing effort in understanding the risk perception and screening practices among HIV-infected and uninfected women is critical to reducing potential morbidity and mortality.

Materials and Methods

Study setting and area

This study was carried out in Bingham University Teaching Hospital (BHUTH) located in Jos North LGA of Plateau State [19]. The Hospital has a vesicovaginal fistula center that provides clinical services to hundreds of thousands of women from within and outside the country [20].

Jos North LGA has an HIV prevalence of 16% which is the highest among the 17 LGAs in the State [21,22]. The Local Government Area has seven health facilities providing comprehensive HIV/AIDS care and support services, and these include Jos University Teaching Hospital (JUTH), (BHUTH), Plateau Specialist Hospital, Our Lady of Apostle Hospital, Faith Alive Foundation, Hwolshe Medical Centre and Solat Hospital, all supported through the PEPFAR program through APIN Public Health Initiative.

Study design and study population

This was a comparative cross-sectional study. The study was carried out among two groups consisting;

HIV-infected group: All HIV-infected women of reproductive age group, confirmed by evident test results, with a history of at least one childbirth and accessing HIV care and treatment BHUTH, Jos.

HIV uninfected group: consists of HIV uninfected women of reproductive age group, confirmed by evident test results with a history of at least one childbirth attending postpartum/immunization clinics in BHUTH, Jos.

Inclusion criteria

HIV-infected group: HIV-infected women confirmed from evident positive HIV test result within reproductive age of 15 to 49 years, with at least one childbirth and accessing HIV care and treatment in BHUTH, Jos.

HIV-uninfected group: HIV uninfected women confirmed from evident negative HIV test result within reproductive age of 15 to 49 years, with at least one childbirth and attending post-partum/ immunization clinic in BHUTH, Jos.

Exclusion criteria

HIV-infected women: HIV-infected women, confirmed from evident positive HIV test results, outside the reproductive age group 0f 15 to 49 years, with a history of at least one childbirth and accessing HIV care and treatment in BHUTH with diagnosed case of cervical cancer.

HIV uninfected women: HIV-uninfected women, confirmed from evident negative HIV test results, within the reproductive age group of 15 to 49 years, with a history of at least one childbirth and accessing HIV care and treatment in BHUTH with diagnosed case of cervical cancer.

Sample size and sampling technique

The minimum sample size was determined using the formula for determining the sample size for a comparative study. For each group, a convenience sampling method was used to recruit participants who met the inclusion criteria. This was done on each of the HIV clinic days until the sample size is met. Similarly, for the uninfected group, women who met the inclusion criteria were recruited to each of the post-partum/immunization clinics until the sample size is met.

Study Instrument and data collection: A structured interviewer-administered questionnaire was used to obtain relevant information from recruited participants. This was adapted from the Champion's Health Belief Model (CHBM) scale and WHO "Improving data for decision-making: a toolkit for cervical cancer prevention and control programs" [23]. The questionnaire had 5 sections: a) Socio demographics b) Health belief model questions on susceptibility, seriousness, benefits, barriers, and self-efficacy, and e) Factors affecting risk perception and screening uptake.

Five research assistants were trained to help with data collection. The questionnaire was pretested among 10% of the total sample size Data was collected for four weeks from 10th May to 15th June 2021. For both HIV-infected and uninfected participants, their HIV status was determined from their files. Data was collected in the HIV clinic for HIV infected group and the immunization/post-partum clinic for HIV uninfected group this was continued until the sample size was collected. The questionnaires measure the sociodemographic factors, risk factors for cervical cancer (explanatory variables), and Pap smear and Risk perception measured in five risk perception constructs as outcome variables. The risk perception construct was measured using the modified adapted Champion's Health Belief Model (CHBM) scale. Items in each construct were measured using a three-point Likert scale ranging from disagree (1 point) to agree (3 points).

Measurement of variables

Variables that were measured as dependent variables were risk perception and screening uptake among HIV-infected and uninfected women. Variables that were measured as independent variables are the social demographic characteristics, and factors affecting risk perception and uptake.

Scoring of responses: The perception was scored on individual items, and this was rated on a 3-point Likert scale where 1 indicates disagreement (negative perception), 2 indicate indifference (neutral) and 3 indicate agreement (positive perception). Questions were asked in all the five constructs of risk perception (susceptibility, seriousness, benefit, barrier, and self-efficacy). A total of 12 questions which carries a total of 36 scores were obtained. Participants with a summary score greater than or equal to the mean value were categorized as having "good perception" and those with a score less than the mean were categorized as having poor perception.

Statistical analysis

All the data that was generated was entered into excel and

analyzed using the IBM Statistical Package for Social Sciences (SPSS) version 23. A p-value of ≤ 0.05 was considered statistically significant for all statistical tests. Basic descriptive statistics of the socio-demographic characteristic were presented in frequencies and percentages and the quantitative variables were described with mean and standard deviation. Chi-square was done to describe associations between socio-demographic features stratified by HIV status. The significant association between these groups was assessed and the item score was summarized. The risk perception and screening practice was determined, stratified by HIV status, and a significant relationship was determined using the chi-square test. A multiple logistic regression model was fitted, adjusting for confounders used to determine predictors of risk perception and screening practice.

Ethical consideration

Ethical approval for the study was obtained from the FCDA Health and Research Ethics Committee. Written informed consent was obtained from each study participant. Respondents were free to withdraw anytime during the study if they so desired. The participants were assured of the confidentiality of their information.

Limitation

The fear of stigma and discrimination following disclosure of status to the research team, since, the team is not part of their regular care provider was controlled through the elimination of identifiers on the questionnaire by coding each questionnaire and assurance of confidentiality.

Results

One hundred and twenty-four respondents were interviewed in both HIV-infected and uninfected groups respectively. The age range of the respondents in this study was 18 to 49 years. The mean age of respondents in the HIV-infected group was 37.54 ± 7.52 years and in the HIV uninfected group was 31.23 ± 5.85 years and this was non-comparable (X=63.92; df=3; p=0.001). The majority of respondents in the HIV-infected group have a secondary level of education 45 (66.2%) while most of the HIV uninfected 88 (69.3%) have a tertiary level of education and this was statistically significant (X^2=40.16; df=3; p=0.001). The majority in both groups were married; 67 (37.6%) in HIV infected group and 111 (62.4%) in the uninfected group while all widowed 15 (100.0%) were HIV-infected. More respondents among the HIV-infected group 37 (64.9) reported having multiple sexual partners compared to uninfected respondents 20 (35.1) (Table 1).

The cervical cancer risk perception health belief model constructs were not statistically significantly different between the HIV infected and uninfected in all constructs (susceptibility (p=0.809) seriousness (p=1.000), benefit (p=0.898), barrier (p=0.586) except for self-efficacy construct (p=0.028) (Table 2). There was no statistically significant difference in the risk perception between HIV-infected and uninfected respondents (p=0.610) (Table 3).

There was a statistically significant association between age and risk perception among the HIV-infected respondents (p=0.001) (Table 4). However, among the HIV uninfected group, age was not significantly associated with risk perception (p=0.604). Marital status was significantly associated with risk perception in both HIV infected (p=0.003) and uninfected (p=0 012) respondents. Risk perception was significantly associated with the number of sexual partners among HIV-infected respondents (p=0.032), while among the HIV-uninfected respondents there was no statistically significant association (p=0.809). Among the HIV uninfected respondents, religion was significantly associated with risk perception (p=0.033) (Table 5).

Those age group 35 to 44 years, had 10 times odds (OR=10.00, CI: 2.23-44.84, p=0.003) while those age group ≥ 45 years had 8 times odds (OR=8.94, CI: 1.80-44.34, p=0.007) of having good risk perception of cervical cancer compared to those in the age group 15 to 24 years among the HIV infected group and this was statistically significant. However, age was not a predictor of risk perception among the uninfected respondents. The study finds that those who had more than one sexual partner had 3 times the odds of good risks perception compared to those with only one partner (OR=3.05, CI: 1.10-8.44, p=0.031) among those that were HIV infected, this was not significant among HIV uninfected respondents (OR=1.29, CI: 0.45-3.78, p=0.063). Among the HIV uninfected respondents, those that reported Islam as their religion were 77 percent less likely to have a good risk perception of cervical cancer compared to those that reported Christianity as their religion (OR=0.23, CI: 0.05-0.94, p=0.041).

Table 1: Sociodemographic characteristics of HIV-infected and uninfected women respondents.

Variables	HIV status		X^2	p-value
	Infected n=124	Uninfected n=124		
	Freq (%)	Freq (%)		
Age group (yrs)				
15-24	20(29.4)	48(70.6)	63.917	0.001*
25-34	38(36.2)	67(63.8)		
35-44	41(83.7)	8(16.3)		
≥ 45	25(96.2)	1(3.8)		
Educational level				
No education	10(83.3)	2(16.7)	40.161	0.001*
Primary	30(73.2)	11(26.8)		
Secondary	45(66.2)	23(33.8)		
Tertiary	39(30.7)	88(69.3)		
Marital status				
Single	30(76.9)	9(23.1)	41.184	0.001*
Married	67(37.6)	111(62.4)		
Separated	12(75.0)	4(25.0)		
Widow	15(100.0)	0(0.0)		
Number of sexual partners				
1	87(45.5)	104(54.5)		
≥ 2	37(64.9)	20(35.1)		
Religion				
Christian	107(50.0)	107(50.0)	0	1
Islam	17(50.0)	17(50.0)		

*Statistically significant; †Fisher's exact

Table 2: Comparison of cervical cancer risk perception health belief model construct among HIV-infected and non-infected women (n=124).

Variables	HIV Status		X^2	p-value
	HIV infected	HIV uninfected		
Susceptibility				
Good	49(46.7)	58(53.3)	0.809	0.441
Poor	75(52.4)	68(47.6)		
Seriousness				
Good	70(50.4)	69(49.6)	0.016	1
Poor	54(49.5)	55(50.5)		
Benefit				
Good	54(50.9)	52(49.1)	0.066	0.898
Poor	70(49.3)	72(50.7)		
Barrier				
Good	37(46.8)	42(53.2)	0.464	0.586
Poor	87(51.5)	82(48.5)		
Self-efficacy				
Good	42(41.2)	60(58.8)	5.396	0.028*
Poor	82(56.2)	64(43.8)		

*Statistically significant; †Fisher's exact

Table 3: Comparison of cervical cancer risk perception among HIV-infected and uninfected women (n=124).

Variables	HIV Status		X^2	p-value
	HIV infected	HIV uninfected		
Risk perception				
Good	65(48.1)	70(51.9)	0.406	0.61
Poor	59(52.2)	54(47.8)		

Table 4: Comparison of factors affecting cervical cancer risk perception among HIV-infected and uninfected women.

variables	Risk perception of cervical cancer			
	HIV infected n=124		HIV uninfected n=124	
	Good n=65	Poor n=59	Good n=70	Poor n=54
	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Age group(yrs)				
15-24	5(25.0)	15(75.0)	27(56.3)	21(43.8)
25-34	15(39.5)	23(60.5)	36(53.7)	31(46.3)
35-44	29(70.7)	12(29.3)	6(75.0)	2(25.0)
≥ 45	16(64.0)	9(36.0)	1(100.0)	0(0.0)
	X^2=15.439; df=3; p=0.001*		X^2=2.093; df=3; p=0.604†	
Educational level				
No education	2(20.0)	8(80.0)	1(50.0)	
Primary	18(60.0)	12(40.0)	7(63.6)	
Secondary	28(62.2)	17(37.8)	12(52.2)	
Tertiary	17(43.6)	22(56.2)	50(56.8)	
	X^2=7.858; df=3; p=0.051		X^2=0.441; df =3; p=0.916†	
Marital status				
Single	21(70.0)	9(30.0)	1(11.1)	8(88.9)
Married	26(38.8)	41(61.2)	67(60.4)	44(39.6)
Separated	6(50.0)	6(50.0)	2(50.0)	2(50.0)
Widowed	12(80.0)	3(20.0)	0.(0.0)	0(0.0)
	X^2=13.299; df =3: p=0.003*		X^2=8.284; df=2; p=0.012†*	
Number of sexual partners				
1	40(46.0)	47(54.0)	58(55.8)	46(44.2)
≥ 2	25(67.6)	12(32.4)	12(60.0)	8(40.0)
	X^2=4.852; df=1; p=0.032*		X^2=0.122; df=1; p=0.809*	
Religion				
Christian	57(53.3)	50(46.7)	56(52.3)	51(47.7)
Islam	8(47.1)	9(52.9)	14(82.4)	3(17.6)
	X^2=0.227; df=1; p=0.795		X^2=5.376; df =1; p=0.033*	

*Statistically significant; †Fisher's exact

Table 5: Logistic regression showing predictors of risk perception among HIV infected and uninfected respondents (n=124).

Variable	HIV infected			HIV uninfected		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Age group						
15-24	1			1		
25-34	1.515	0.38-6.06	0.557	1.138	0.49-2.62	0.764
35-44	10	2,23-44.84	0.003*	2.734	0.49-16.30	0.252
≥ 45	8.949	1.80-44.34	0.007*	6.57	0.01-1.00	0.999
Marital status						
Single	1			1		
Married	2.73	0.45-16.65	0.276	0.001	0.001-1.00	0.999
Separated	0.28	0.06-1.21	0.087	2.972	0.32-27.94	0.341
Widow	0.368	0.52-2.63	0.319			
Number of sexual partners						
1	1			1		
≥ 2	3.054	1.10-8.44	0.031*	1.299	0.45-3.78	0.631
Religion						
Christian	1			1		
Islam	1.122	0.32-3.91	0.857	0.229	0.05-0.94	0.041*

*Statistically significant; †Fisher's exact

Discussion

This study finds that the risk perception in both HIV infected and uninfected respondents were low, there was no significant difference in risk perception among HIV infected and uninfected respondents. This was consistent with a study done among female employees in Jos that reported low-risk perception for cervical cancer [24]. Further, a study was done among female University students who also reported low-risk perceptions despite engaging in risky sexual behavior [25]. Similar low-risk perception was reported in a study among British and American women [25]. Another study done in Johannesburg, South Africa reported higher risk perception among HIV women [26]. This may be connected to the fact that every woman who attends the HIV clinic must have had counseling on STI prevention which enhances motivation for a better quality of life. The finding in this study may be due to a lack of awareness and knowledge about the disease and its prevention as it is a critical factor in modifying risk perception.

The majority of the women reported poor susceptibility, benefits, and barriers to cervical cancer, while slightly more than half considered cervical cancer as a serious disease. The study also found that HIV-infected women had less self-efficacy for risk perception compared to HIV-uninfected women. Women who believe that they are not at risk of the disease may forgo screening, thereby missing the opportunity and benefit of early detection and treatment.

There was a significant association between age and risk perception among the HIV infected, but among the HIV uninfected group age was not associated with risk perception. The mean age in this study was 35 years. Similar findings were reported in a study done in southwest Nigeria [8]. Other studies done in Kenya, South Africa, and Ethiopia reported similar findings [27-29]; This may be attributed to the fact that most women are recruited into HIV care through the PMTCT program, thereby leaving out the younger age group and the older ones.

In this study, level of education was not associated with risk perception in both HIV-infected and uninfected women. This apparent disconnect highlighted a lack of awareness about cervical cancer in the public and missed opportunities for cervical cancer education in general among women attending health facilities and institutions. Women had interfaced with the health system but do not have sufficient knowledge. A large proportion of women attend antenatal, are delivered in facilities, and bring their infants for immunization and yet were not educated about cervical cancer.

The study finds that there was good risk perception among HIV-infected women, though engaging in risky behavior such as having multiple sexual partners. A similar finding was reported in a study carried out among university students; though they have high levels of education were engaged in risky behavior of having multiple sexual partners [25]. This supposed dissociation may be due to a lack of awareness and knowledge of cervical cancer.

Male involvement in ensuring increasing uptake of cervical cancer screening should not be underestimated. The men are the head of the house, most of the time is ones the who pay the bills, are more adherent to cultural beliefs, and often decide for the family. This underscores the importance of women's empowerment to achieve their control over health and its determinant. There is a need to carry out a study with a qualitative component to explore further the reason for the poor uptake of screening for cervical cancer among women. This study had significant implications for improving the uptake of cervical cancer screening services and provides the basis for a wide-scale multi-center study.

Conclusion

Risk perception of cervical cancer was low among HIV infected

and uninfected women. Health workers must use every opportunity that women have contact with the health system to provide effective health education on cervical cancer. There is a need to employ multiple approaches in cervical cancer prevention strategies that must be adapted to the current situation and the constraints of Nigeria given the multidimensional barriers to cervical cancer screening.

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References

1. ICO/IARC Information Center on HPV and Cancer. Human Papillomavirus and Related Disaeses Report Global. 2022.
2. ICO/IARC Information Center on HPV and Cancer. Human Papillomavirus and Related Diseases Report, Nigeria. 2022.
3. Ferlay J, Laversanne M, Ervik M, Lam F, Colombet M, Mery L, et al. Global Cancer Observatory: Cancer Tomorrow. Lyon, France: International Agency for Research on Cancer.
4. Seyoum T, Yesuf A, Kejela G, Gebremeskel F. Utilization of Cervical Cancer Screening and Associated Factors among Female Health Workers in Governmental Health Institution of Arba Minch Town and Zuria District, Gamo Gofa Zone, Arba Minch, Ethipoia, 2016. Arch Cancer Res. 2017;5:4-9.
5. Denslow SA, Rositch AF, Firnhaber C, Ting J, Smith JS. Incidence and progression of cervical lesions in women with HIV: a systematic global review. Int J STD AIDS. 2014;25(3):163-77.
6. Odida M, Sandin S, Mirembe F, Kleter B, Quint W, Weiderpass E. HPV types, HIV and invasive cervical carcinoma risk in Kampala, Uganda: a case-control study. Infect Agent Cancer. 2011;6:8.
7. Ezechi OC, Pettersson KO, Okolo CA, Ujah IAO, Ostergren PO. The Association between HIV Infection , Antiretroviral Therapy and Cervical Squamous Intraepithelial Lesions in South Western Nigerian Women. PloS One. 2014;9(5):e97150.
8. Omoragbon A, Gabriel OE, Shabi OM, Ajetunmobi OA, Elegbede OT, Agboola SM, et al. Papanicoleau Smear Usage and Prevalence of Premalignant Cervical Lesion among Women Living with HIV Attending a Federal Teaching Hospital in South-West Nigeria: A Comparative Study. J Cancer Tumor Int. 2017;5(4):1-9.
9. Bawa US, Kolawole AO, Madugu NH, Shehu S. Cervical cytology pattern and human immunodeficiency virus serostatus of women seen in Ahmadu Bello University Teaching Hospital, Zaria, Nigeria. Port Harcourt Med J. 2017;11(2):2-7.
10. Lawal I, Agida E, Offiong RA, Oluwole PO. Cervical Cytology among HIV Positive and HIV Negative Women in a Tertiary Hospital in North Central Nigeria: A Comparative Study. Ann Med Heal Sci Res. 2017;7:308-11.
11. World Health Organization. Cervical cancer common among African women. 2015.
12. Hyacinth HI, Adekeye OA, Ibeh JN, Osoba T. Cervical Cancer and Pap Smear Awareness and Utilization of Pap Smear Test among Federal Civil Servants in North Central Nigeria. PLoS One. 2012;7(10):e46583.
13. Abiodun OA, Fatungase OK, Olu-Abiodun OO, Idowu-Ajiboye BA, Awosile JO. An assessment of women's awareness and knowledge about cervical cancer and screening and the barriers to cervical screening in Ogun State, Nigeria. J Dent Med Sci. 2013;10(3):52-8.
14. Abiodun OA, Olu-abiodun OO, Sotunsa JO, Oluwole FA. Impact of health education intervention on knowledge and perception of cervical cancer and cervical screening uptake among adult women in rural communities in Nigeria. BMC Public Health. 2014;14:814.
15. Lukorito J, Wanyoro A, Kimani H. Uptake of Cervical Cancer Screening among HIV Positive Women in Comrehensive Care Centres in Nairobi, Kenya. 2017;5:1-6.
16. Wong JPH, Vahabi M, Miholjcic J, Tan V, Owino M, Li ATW, et al. Knowledge of HPV/cervical cancer and acceptability of HPV self-sampling among women living with HIV: A scoping review. Curr Oncol. 2018;25(1):e73-e82.
17. Mapanga W, Elhakeem A, Feresu SA, Maseko F, Chipato T. Prevention of cervical cancer in HIV- seropositive women from developing countries through cervical cancer screening : a systematic review protocol. Syst Rev. 2017;6(1):91.
18. World Health Organization. Cervical Cancer.
19. Government PS. Jos North LGA | Plateau State Government Website.
20. Hospital BHUTH. Bingham University Teaching Hospital. 2021.
21. gomwalk NE, Nimzing L, Mawak JD, Ladep NG, Dapiap SB, Damshak D, et al. Sero-Epidemiology of Human Immunodeficiency Virus(HIV) in Plateau State, Nigeria. J Infect Dev Ctries. 2012;6(12):860-9.
22. Ogbe AE, Sagay AS, Imade GE, Musa J, Pam VC, Egah D, et al. Declining Prevalence of Hiv and Other Sexually Transmitted Infections Among Female Sex Workers in Jos, North-Central Nigeria. Afr J Med Med Sci. 2014;43(Suppl 1):5-13.
23. World Health Organization. Improving data for decision making: a toolkit for cervical cancer prevention and control programmes. 2018.
24. Eka PO, Ujah IOA, Pam VC, Swende TZ, Daru PH, Maanongun M. Perception of Cervical Cancer and Cervical Screening, And Uptake of Pap Smear Among Female Employees of the Jos University Teaching Hospital And Its Environs. J Nursing Health Sci. 2017;5(5):1-5.
25. Muliira JK, Kisaakye E, Kizza IB, Suubi RR. Perceived cervical cancer risk, knowledge and preventive practices. Afr J Midwifery Womens Health. 2011;5(2):87-93.
26. Mokhele I, Evans D, Schnippel K, Swarts A, Smith JS, Firnhaber C. Awareness, perceived risk and practices related to cervical cancer and pap smear screening: A cross-sectional study among HIV-positive women attending an urban HIV clinic in Johannesburg, South Africa. South Afr Med J. 2016;106(12):1247-53.
27. Gedefaw A, Astatkie A, Tessema GA. The Prevalence of Precancerous Cervical Cancer Lesion among HIV-Infected Women in Southern Ethiopia: A Cross-Sectional Study. PLoS One. 2013;8(12):e84519.
28. Moodley JR, Constant D, Hoffman M, Salimo A, Allan B, Rybicki E, et al. Human papillomavirus prevalence, viral load and pre-cancerous lesions of the cervix in women initiating highly active antiretroviral therapy in South Africa: a cross-sectional study. BMC Cancer. 2009;9:275.
29. Memiah P, Mbuthia W, Kiiru G, Agbor S, Odhiambo F, Ojoo S, et al. Prevalence and risk factors associated with precancerous cervical cancer lesions among HIV-infected women in resource-limited settings. AIDS Res Treat. 2012;2012:953743.