



## KNOWLEDGE OF HPV AND WILLINGNESS TO PAY FOR HPV VACCINES AMONG WOMEN WITH KNOWN HIV STATUS AT LAGOS UNIVERSITY TEACHING HOSPITAL, IDI ARABA MUSHIN

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**Abstract:** Introduction: Human Papillomavirus (HPV) is a prevalent DNA virus that poses a substantial health threat globally, particularly among women. In the context of HIV, the risk of HPV infection is heightened, with associated complications such as cervical cancer. This study focuses on assessing the knowledge and willingness to pay for HPV vaccines among women with known HIV status at Lagos University Teaching Hospital, Idi Araba Mushin, Nigeria. The intersection of HPV and HIV amplifies the health challenges faced by women, necessitating a comprehensive understanding of their knowledge levels and attitudes toward preventive measures.

**Objective:** The primary objective of this study was to investigate the knowledge levels of HPV and willingness to pay for HPV vaccines among women living with HIV. The exploration of socio-demographic factors influencing knowledge and attitudes adds a crucial dimension to the understanding of the complexities surrounding HPV awareness in this vulnerable population.

**Method of Data Analysis:** A robust research methodology was employed, involving 200 women with HIV selected through stratified random sampling. The data analysis encompassed both descriptive techniques,

including percentages and chi-square tests, and inferential methods. SPSS version 23 facilitated the statistical processing, contributing to a comprehensive exploration of the study objectives.

**Results:** The socio-demographic profile of the participants highlighted the diverse characteristics of the sample, with a predominant HIV-positive status (98.0%). Despite the high prevalence of HIV, the awareness of HPV was limited, with only 38.0% having heard of the virus. The overall knowledge of both HPV and HPV vaccines was notably low, with a mere 15.9% demonstrating good knowledge. Health professionals emerged as the primary source of information (34.0%). The majority of participants (67.0%) expressed hesitancy toward paying for the HPV vaccine, even for cervical cancer prevention. Educational status significantly influenced knowledge levels ( $p = 0.020$ ). However, no significant associations were found between sociodemographic factors and knowledge of the HPV vaccine.

**Conclusion:** The findings underscore the pressing need for targeted educational interventions to bridge the knowledge gap and dispel myths surrounding HPV among women living with HIV. Addressing financial concerns and fostering positive attitudes toward preventive measures, including vaccination and screenings, is essential. This study provides valuable insights into the intricate dynamics of HPV awareness and preventive measures in a population at increased risk due to the intersection of HPV and HIV.

**Key words:** *Human Papillomavirus, HPV vaccine, women with HIV, knowledge, willingness to pay, socio-demographic factors, Nigeria.*

## Background

In the realm of health, human papillomavirus (HPV), a DNA virus from the Papillomaviridae family, stands out as the primary culprit behind conditions such as cervical cancer, genital warts, and laryngeal papillomatosis. Typically transmitted through sexual contact, HPV has a near-universal infection rate, affecting almost every individual at some point (Mbachu et al., 2017). Cervical cancer, especially prevalent in women globally, is particularly pervasive in developing countries, ranking as one of the most common cancers (Mbachu et al., 2017). The global prevalence of HPV hovers around 11–12%, with regional variations ranging from 16% to 24% among women (Onyemaechi et al., 2018). Sub-Saharan Africa bears a notably higher burden, with an estimated HPV prevalence of 24.0% (Onyemaechi et al., 2018).

Women with HIV/AIDS face an elevated risk of HPV infection, with an estimated 5% of cervical cancer cases linked to HIV/AIDS (Akarolo-Anthony et al., 2014; Bruni et al., 2019). In 2018, 5.8% of new cervical cancer cases globally were diagnosed in women living with HIV (Bruni et al., 2019). Implementing HPV screening tests in many developing countries, particularly in Africa, poses challenges due to issues like cost and complexity (CDC, 2015). Although proven effective, HPV vaccines, recommended for girls and young females aged 9-26, are hindered by affordability concerns in these nations. Global initiatives, exemplified by GAVI, have sought to support vaccination efforts in developing countries (Cobucci et al., 2015).

In Nigeria, commonly used HPV vaccines, Cervarix and Gardasil, are not part of the routine national immunization program (Cochran, 1977). The knowledge gap regarding HPV infections and vaccines among women in Nigeria, coupled with the financial barrier to vaccination, remains a critical issue. Enhancing awareness could potentially boost demand and accessibility for these vaccines (Saleh and Aji, 2013). HIV-positive women often lack knowledge about preventing cervical cancer and HPV transmission, contributing to low perceived susceptibility and limited uptake of preventative interventions (Isara and Osayi, 2021). Despite

the significant burden of cervical cancer, acceptance of screening remains a considerable challenge in many developing nations (Bray et al., 2018). The introduction of HPV self-sampling awareness seeks to address this challenge, enhancing willingness and acceptability in screening centers (Bzhalava et al., 2013). However, it is essential to conduct sufficient research on the acceptability of new screening methods, particularly among women with known HIV status (Agida et al., 2015).

Research on knowledge and willingness to pay for HPV vaccines among women with known HIV status is scarce in developing countries (Agida et al., 2015). Additionally, limited information exists about HPV infection causing cervical cancer and genital warts among women in Sub-Saharan Africa (Cochran, 1977). The absence of national screening programs in many developing countries, coupled with resource constraints, weak health systems, and poor health-seeking behavior, further impedes knowledge and willingness to pay for HPV vaccines (Cochran, 1977). Addressing these gaps, this study aims to assess the knowledge and willingness to pay for HPV vaccines among women with known HIV status at Lagos University Teaching Hospital, Idi Araba Mushin.

## **Materials and Methods**

### **Study Area**

Lagos University Teaching Hospital (LUTH), the study area for investigating knowledge and willingness to pay for HPV vaccines among women with known HIV status, has a significant history in Nigeria's healthcare and medical education. Established in 1962, LUTH responded to the increasing demand for advanced medical services and training in Nigeria, becoming a leading institution in patient care, medical research, and education. Affiliated with the University of Lagos, LUTH has played a pivotal role in shaping the nation's healthcare workforce and stands as a hub for academic excellence. Strategically located in Idi Araba Mushin, LUTH provides accessible and comprehensive healthcare services to a diverse urban population, serving as a critical institution in Lagos' healthcare ecosystem. The study within LUTH is expected to yield insights into knowledge and attitudes surrounding HPV vaccination among women with known HIV status in Nigeria's urban context.

### **Study Population**

The study population comprised of women living with HIV aged 15 years and above receiving treatment at the Lagos University Teaching Hospital. Also, at least 200 respondents were needed. The women were recruited after obtaining a written informed consent.

### **Sampling Technique**

The sampling method employed in this study was stratified random sampling, a technique that involved categorizing the population based on factors that might impact knowledge and willingness to pay for HPV vaccines. These factors included age groups, duration of HIV treatment, and other pertinent variables. The sample size was allocated proportionately to the size of each stratum to guarantee representation from diverse subgroups. Participants were then randomly selected from each stratum using a random number generator or a randomized selection method, ensuring that each subgroup was sufficiently represented in the final sample. A total of 200 women were selected for inclusion in the study.

### **Data collection and management**

The data collected for this study were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 23. The statistical processing encompassed both descriptive techniques, such as frequency tables, percentages, proportions, bar charts, pie charts, mean, and standard deviations, as well as

inferential methods, specifically the Chi-square test. Descriptive statistics were employed to characterize the study participants and variables, while the Chi-square test investigated relationships between categorical variables and tested hypotheses. A significance level of 0.05 (5%) was set for all analyses. In instances where appropriate, scoring adjustments were applied. The findings were presented using tables and percentages.

### Ethical Approval

Ethical approval was obtained from the Ethical Review Committee of Lagos University Teaching Hospital (LUTH), Lagos state. This ethical approval was sought to ensure that the study aligns with universally recognized scientific norms and adheres to global ethical standards essential for research involving human subjects. The respondents provided informed consent, and the confidentiality of the collected data was rigorously maintained. The study posed no discernible risks to the participants. No financial compensation was offered, solicited, or expected by the researcher or her assistants in exchange for participants' involvement. Respondents had complete autonomy in deciding whether or not to participate in the study. The questionnaire deliberately refrained from requesting participants' names, and the information gathered was strictly utilized for research purposes.

### Results

**Table 1: Socio-demographic characteristics of the respondents**

Socio-demographic (N=200)	Number (N)	Percentage (%)
<b>Age group</b>		
≤30	20	10.0
31-40	54	27.0
41-50	80	40.0
51-60	35	17.5
>60	11	5.5
Age (Mean ± SD) 42.18 ± 7.54		
<b>Ethnicity</b>		
Igbo	11	5.5
Yoruba	159	79.5
Hausa	5	2.5
Others	25	12.5
<b>Education</b>		
No education	8	4.0
Primary	54	27.0
Secondary	97	48.5
Tertiary	41	20.5
<b>Working status</b>		
Not working		
Working	15	7.5

	185	92.5
<b>Profession</b>		
Unemployed	14	7.0
self-employed	160	80.0
Professional	18	9.0
civil servant	8	4.0
<b>Source of Income</b>		
Family	15	7.5
Wages	153	76.5
Salary	32	16.0
<b>Marital status</b>		
Single	20	10.0
married	157	78.5
co-habiting	1	0.5
seperated	31	15.5
divorced	4	2.0
widowed	27	13.5
<b>Income(N)</b>		
<18000	166	83.0
18000-35000	122	61.0
>100000	8	4.0
36000-50000	22	11.0
51000-70000	8	4.0
71000-100000	9	4.5
<b>Number of sexual partners</b>		
no sexual partner	68	34.0
<3 sexual partner	17	8.5
1 sexual partner	116	58.0
>3 sexual partner	1	0.5
<b>HIV status</b>		
Negative	4	2.0
Positive	196	98.0
<b>Years with HIV</b>		
<1	14	7.0
1-5	80	40.0
>5	106	53.0

<b>CD4 count</b>		
Don't know	166	83.0
<350	27	13.5
>350	7	3.5
<b>ARV</b>		
No	190	95.0
Yes	10	5.0
<b>Viral load</b>		
Undetected	10	5.0
Detected	17	8.5
Don't know	173	86.5

The socio-demographic profile of the 200 study participants revealed a diverse distribution across age groups, with 20 individuals (10.0%) aged  $\leq 30$ , 54 (27.0%) in the 31-40 range, 80 (40.0%) between 41-50, 35 (17.5%) in the 51-60 bracket, and 11 (5.5%) over 60, resulting in a mean age of  $44.18 \pm 9.54$ . Ethnicity representation included 11 (5.5%) Igbo, 159 (79.5%) Yoruba, 5 (2.5%) Hausa, and 25 (12.5%) from other ethnic groups. Educational backgrounds varied, with 8 (4.0%) having no education, 54 (27.0%) primary, 97 (48.5%) secondary, and 41 (20.5%) tertiary education. In terms of employment, 15 (7.5%) were not working, and 185 (92.5%) were employed, including 14 (7.0%) unemployed, 160 (80.0%) self-employed, 18 (9.0%) in professional roles, and 8 (4.0%) as civil servants. Regarding the source of income, 15 (7.5%) depended on family support, 153 (76.5%) received wages, and 32 (16.0%) earned a salary. Marital status distribution indicated 20 (10.0%) single, 157 (78.5%) married, 1 (0.5%) co-habiting, 31 (15.5%) separated, 4 (2.0%) divorced, and 27 (13.5%) widowed individuals. Income distribution categorized 166 (83.0%) participants with an income of less than ₦18,000, 122 (61.0%) between ₦18,000-₦35,000, 8 (4.0%) over ₦100,000, 22 (11.0%) between ₦36,000-₦50,000, 8 (4.0%) between ₦51,000-₦70,000, and 9 (4.5%) between ₦71,000-₦100,000. The number of sexual partners varied, with 68 (34.0%) having no sexual partner, 17 (8.5%) having less than three sexual partners, 116 (58.0%) having one sexual partner, and 1 (0.5%) having more than three sexual partners. HIV status distribution showed 4 (2.0%) participants as HIV-negative and 196 (98.0%) as HIV-positive. The distribution of years with HIV included 14 (7.0%) with less than a year, 80 (40.0%) with 1-5 years, and 106 (53.0%) with over 5 years. Regarding CD4 count, 166 (83.0%) were unaware, 27 (13.5%) had a count below 350, and 7 (3.5%) had a count above 350. Concerning ARV usage, 190 (95.0%) were on ARVs, while 10 (5.0%) were not. Viral load distribution indicated 10 (5.0%) with an undetected viral load, 17 (8.5%) with a detected viral load, and 173 (86.5%) who did not know their viral load status.

**Table 2: Knowledge of Human Papilloma Virus (HPV) Among Respondents**

Knowledge/belief	No	Yes
	N(%)	N(%)
Have you ever heard of HPV?	124 (62.0)	76 (38.0)

Can Smoking be related to HPV?	21 (10.5)	179 (89.5)
HPV can cause genital warts	165(82.5)	35(17.5)
Can HPV be transmitted during sexual intercourse?	141(70.5)	59(29.5)
Can people get HPV infection for a long time without knowing?	114(57.0)	86(43.0)
Have you ever undergone HPV testing?	137(68.5)	63(31.5)
Can screening for cervical cancer in women with HIV prevent developing cancer?	130(65.0)	70(35.0)
Does a negative HPV result indicate a low risk of cervical cancers?	155(77.5)	45(22.5)

The participants' knowledge of Human Papilloma Virus (HPV) in table 2 revealed that 38.0% had heard of HPV, while 89.5% believed that smoking could be related to HPV. Additionally, 17.5% acknowledged that HPV can cause genital warts, and 29.5% were aware that HPV can be transmitted during sexual intercourse. Furthermore, 43.0% believed that people can have HPV infection for a long time without knowing. In terms of testing, 31.5% had undergone HPV testing. Concerning cervical cancer, 35.0% believed that screening for cervical cancer in women with HIV can prevent its development, and 22.5% thought that a negative HPV result indicates a low risk of cervical cancers.

**Table 3; Respondents' sources of information about HPV**

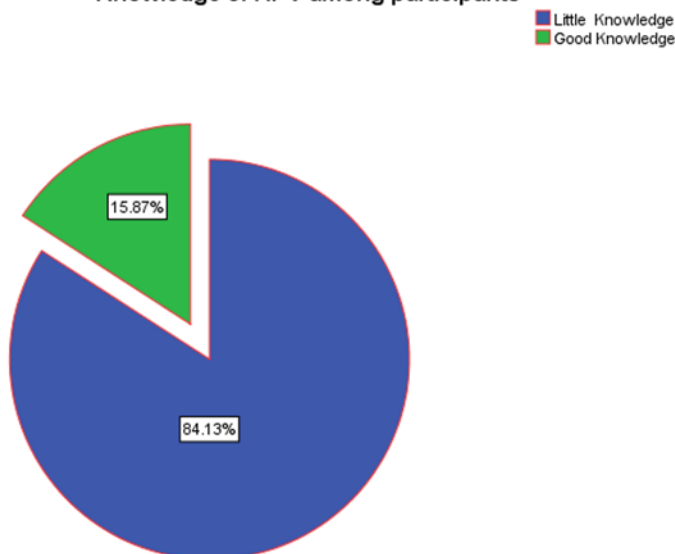
Source of information about HPV	N	Percentage(%)
Health Professionals	68	34.0
TV/Radio	6	3.0
Social media	2	1.0
Not Indicated	124	62.0

Table 3 presents the sources of information about HPV among the respondents. Health professionals were the primary source for 34.0% of participants, followed by TV/radio at 3.0%, and social media at 1.0%. A significant portion, 62.0%, did not indicate their sources of information.

**Figure 1: showing the overall knowledge of Human Papilloma Virus (HPV) among participants**

The figure below showed that the respondents with good knowledge of Human Papilloma Virus were 15.9%, as against 84.1% that had little knowledge of Human Papilloma Virus.

Knowledge of HPV among participants



**Table 4; Respondents Knowledge of HPV vaccine**

Knowledge	No N(%)	Yes N(%)
Have you heard of HPV vaccine?	164(82.0)	36(18.0)
Does HPV vaccine cure cancer?	18(9.0)	182(91.0)
Is it still necessary to regularly get screened for cancer if you've already received the HPV vaccine?	163(81.5)	37(18.5)
Are HPV vaccine highly effective in preventing HPV?	167(83.5)	33(16.5)
Are HPV vaccine highly effective in preventing cervical cancer?	172(86.0)	28(14.0)

Table 4 illustrates the respondents' knowledge regarding HPV vaccine. The majority, 82.0%, had heard of the HPV vaccine, while 18.0% were not familiar with it. Regarding the belief in the curative properties of the HPV vaccine for cancer, 91.0% affirmed its potential, with only 9.0% expressing skepticism. Furthermore, 81.5% were uncertain about the necessity of regular cancer screenings after receiving the HPV vaccine, while 18.5% considered it necessary. In terms of effectiveness, 83.5% believed HPV vaccines are highly effective in preventing HPV, and 16.5% held the opposite view. Similarly, 86.0% believed in the high effectiveness of HPV vaccines in preventing cervical cancer, while 14.0% expressed doubt.

**Table 5: Respondents Overall knowledge of HPV vaccine**



Knowledge Level	N	Percentage(%)
Good	34	17.0
Little knowledge	166	83.0

Table 5 illustrates the knowledge levels of 200 respondents regarding the HPV vaccine, indicating that 17.0% demonstrated good knowledge, while the majority, comprising 83.0%, had limited knowledge about the HPV vaccine.

**Table 6: Respondents who are willing to pay for HPV vaccine**

Respondents who are willing to pay for HPV vaccine	No N(%)	Yes N(%)	Not sure N(%)
Would you consider paying for the HPV vaccine to prevent cervical cancer?	134(67.0)	26(13.0)	40(20.0)
Having the knowledge of cervical cancer among women living with HIV, are you willing to pay for HPV vaccine?	116(58.0)	42(21.0)	42(21.0)
Are you willing to purchase the HPV vaccine even if it comes at a high cost?	120(60.0)	39(19.5)	41(20.5)
Do you personally know a family member or friend who has bought the HPV vaccine before?	152(76.0)	8(4.0)	40(20.0)
If the government offers subsidies for the HPV vaccine, would you be willing to contribute financially?	106(53.0)	65(32.5)	29(14.5)

Table 6 above indicates that a significant proportion of respondents are hesitant to pay for the HPV vaccine, with 67.0% expressing reluctance to consider payment for cervical cancer prevention. Additionally, 58.0% are unwilling to pay when aware of cervical cancer among women with HIV, and 60.0% are hesitant even if the vaccine is costly. Most respondents (76.0%) do not have personal connections with someone who purchased the HPV vaccine, while 53.0% are unwilling to contribute financially, even if the government provides subsidies. Overall, these findings highlight varying levels of reluctance among respondents regarding payment and financial contributions for the HPV vaccine.

**Table 7: Respondents' willingness to vaccinate their daughters against HPV**

Respondents' willingness to vaccinate their daughters against HPV	Frequency	Percent
Are you willing to get your daughter vaccinated?		
Yes	117	58.9
No	83	41.1
Would you be willing to pay for your daughter's vaccine?		
Yes	110	55.4

No	90	44.6
If vaccination is free would you allow all females around you to be vaccinated?		
Yes	161	80.5
No	39	19.5

Table 7 illustrates the respondents' willingness to vaccinate their daughters against HPV. Approximately 58.9% expressed a positive inclination toward getting their daughters vaccinated, with 55.4% indicating a willingness to bear the associated costs. Moreover, if vaccination were provided free of charge, a significant 80.5% would support the immunization of all females around them, while 19.5% would not.

**Table 8: Relationship between selected socio-demographic characteristics (such as age, marital status and educational status) and women's knowledge of HPV.**

Socio-demographic characteristics	Respondents' overall knowledge of HPV.		Total	Pears on chi-square	df	p-value
	Good knowledge	Little knowledge				
<b>Age (years)</b>				<b>2.182</b>	<b>4</b>	<b>0.702</b>
≤30	5(12.5%)	35(87.5%)	40(100%)			
31-40	10(9.3%)	98(90.7%)	108(100%)			
41-50	12(7.5%)	149(92.5%)	161(100%)			
51-60	4(5.6%)	67(94.4%)	71(100%)			
>60	3(1.7%)	14(82.4%)	17(100%)			
<b>Marital status</b>				<b>3.027</b>	<b>5</b>	<b>0.696</b>
Single	2(8.3%)	22(83.3%)	24(100%)			
Married	42(5.9%)	194(94.1%)	236(100%)			
Co-habiting	0(0.0%)	1(100.0%)	1(100%)			
Separated	2(4.3%)	45(95.4%)	47(100%)			
Divorced	0(0.0%)	6(100.0%)	6(100%)			
Widowed	10(12.0%)	73(88.0%)	83(100%)			
<b>Educational status</b>				<b>9.603</b>	<b>3</b>	<b>0.020*</b>
No formal education	1(12.5%)	7(87.5%)	8(100%)			
Primary	5(9.1%)	50(90.9%)	55(100%)			
Secondary	30(31.0%)	67(69.0%)	97(100%)			
Tertiary	5(12.2%)	36(87.8%)	41(100%)			

Table 8 presents the relationship between selected socio-demographic characteristics (age, marital status, and educational status) and women's overall knowledge of HPV. The chi-square test assessed the association, revealing no significant relationship between age and knowledge of HPV ( $\chi^2 = 2.182$ ,  $df = 4$ ,  $p = 0.702$ ), marital status and knowledge of HPV ( $\chi^2 = 3.027$ ,  $df = 5$ ,  $p = 0.696$ ), but a significant relationship was found between educational status and knowledge of HPV ( $\chi^2 = 9.603$ ,  $df = 3$ ,  $p = 0.020$ ). The data suggests that educational status may influence women's knowledge of HPV among the study participants.

**Table 9: Relationship between selected sociodemographic factors including age, marital status and level of education and women's knowledge of the HPV vaccine.**

Socio-demographic characteristics	Respondents' overall knowledge of HPV vaccine.		Pearson chi-square	df	p-value
	Good knowledge	Little knowledge			
<b>Age (years)</b>			<b>3.862</b>	<b>4</b>	<b>0.425</b>
≤30	2(10.0%)	18(90.0%)			
31-40	12(22.2%)	42(77.8%)			
41-50	13(16.1%)	67(83.9%)			
51-60	6(16.9%)	29(83.1%)			
>60	3(11.8%)	8(88.2%)			
<b>Marital status</b>			<b>2.012</b>	<b>5</b>	<b>0.848</b>
Single	3(12.5%)	17(87.5%)			
Married	21(18.2%)	136(81.8%)			
Co-habiting	0(0.0%)	1(100.0%)			
Separated	4(17.0%)	27(83.0%)			
Divorced	0(0.0%)	4(100.0%)			
Widowed	11(16.9%)	16(83.1%)			
<b>Educational status</b>			<b>7.022</b>	<b>3</b>	<b>0.071</b>
No formal education	1(6.7%)	7(93.3%)			
Primary	8(16.2%)	47(83.8%)			

Secondary	20(14.0%)	77(86.0%)	
Tertiary	6(25.0%)	35(75.0%)	

Table 9 demonstrates the relationship between selected sociodemographic factors, including age, marital status, and level of education, and women's overall knowledge of the HPV vaccine. The chi-square test assessed the association, revealing no significant relationship between these factors and knowledge of the HPV vaccine ( $\chi^2 = 3.862$ ,  $df = 4$ ,  $p = 0.425$  for age;  $\chi^2 = 2.012$ ,  $df = 5$ ,  $p = 0.848$  for marital status;  $\chi^2 = 7.022$ ,  $df = 3$ ,  $p = 0.071$  for educational status). In summary, the data suggests no substantial association between sociodemographic factors and women's knowledge of the HPV vaccine among the study participants.

### Discussion of findings

The study involved 200 participants, with a mean age of  $42.18 \pm 7.54$  years. This aligns with the findings of Nejo et al. (2018), who reported a mean age of  $42.5 \pm 11.5$  years in their study. The majority of participants were of Yoruba ethnicity (79.5%) and had secondary education (48.5%), differing from Bisi-Onyemaechi et al.'s (2019) study, where 68.3% had tertiary education. Employment was prevalent (92.5%), with most participants being married (78.5%) and having an income below ₦18,000 (83.0%). HIV prevalence was high (98.0%), with 95.0% on antiretroviral therapy (ARVs) (Bisi-Onyemaechi et al., 2019).

Knowledge about HPV varied, with 38.0% having heard of it, 89.5% associating smoking with HPV, and 17.5% aware of its link to genital warts. Overall, knowledge of HPV was 15.9% among participants. Awareness of HPV transmission during intercourse was noted in 29.5%, while 43.0% believed people could have HPV without knowing. This might be attributed to the majority having secondary education. Similar studies have shown limited knowledge of HPV transmission and prevention among women living with HIV (Nkwonta, 2020), and low baseline knowledge (Isara & Osayi, 2021).

For HPV testing, 31.5% had been tested. Regarding cervical cancer, 35.0% believed screening prevents it, and 22.5% thought a negative HPV result indicated low cancer risk. Health professionals (34.0%) were the primary source of HPV information. Concerning the HPV vaccine, 82.0% had heard of it, 91.0% believed it could cure cancer, and 81.5% were unsure about post-vaccination screenings. Participants were confident in the vaccine's effectiveness against HPV (83.5%) and cervical cancer (86.0%). However, only 17.0% demonstrated good knowledge. This finding aligns with Bisi-Onyemaechi et al. and Xiang et al, indicating inadequate knowledge of HPV vaccines and infections. The study found that even with HPV vaccination, routine cancer screening remains necessary, possibly due to self-sampling method advantages (Bisi-Onyemaechi et al., 2018). Regarding willingness to pay, 67.0% were hesitant for cervical cancer prevention, 58.0% if aware of HIV-related risks, and 60.0% even if costly. This contrasts with Nkwonta et al.'s finding that many were willing to pay for the HPV vaccine. Similarly, Isara and Osayi (2019) reported many women unwilling to utilize and pay for the vaccine. In a study by Vermandere et al. (2016), vaccine acceptability was high (88.1%). Rositch et al. found majority willing to be vaccinated if offered at low or no cost (94%). Most (76.0%) had no personal connections to vaccine purchases, and 53.0% wouldn't contribute if the government subsidized it.

For daughters' vaccination, 58.9% were willing, 55.4% ready to pay, and 90.2% supported free vaccinations. This differs from Vermandere et al. (2016), where only 31.1% were willing to pay for their daughters' vaccination. Chi-square tests showed no significant association between age and knowledge of HPV

( $p = 0.702$ ), marital status and knowledge of HPV ( $p = 0.696$ ), but a significant association with educational status ( $p = 0.020$ ). This corresponds with Wabo et al.'s finding that knowledge increased with higher education and older age. Nkwonta et al. also reported age influencing awareness of HPV and cervical cancer screening. In Isara and Osayi's study, educational level and age significantly correlated with knowledge of HPV. No significant relationship was found between sociodemographic factors and knowledge of the HPV vaccine, suggesting no substantial association among study participants.

### Conclusion and Recommendation

This study revealed limited awareness and knowledge about HPV among women with HIV. Despite widespread antiretroviral therapy usage, understanding of HPV and preventive measures, such as vaccination and routine screening, was insufficient, especially among those with secondary education. Health professionals played a vital role as information sources. The findings highlight the need for targeted educational interventions and nuanced health communication strategies to address misconceptions and promote preventive measures. Recommendations include tailored programs for women with HIV, dispelling myths, addressing financial concerns, and fostering a positive attitude towards vaccination and screenings. Proactive efforts can significantly reduce the burden of HPV-related complications and cervical cancer in this vulnerable population.

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