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Research paper

Awareness, Knowledge and Acceptability of Human Papillomavirus Vaccination among Women Utilizing The Outpatient Departments of Selected Healthcare Facilities In Ibadan

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Abstract

Background: Human papillomavirus (HPV) vaccination is vital for preventing cervical cancer, yet awareness and acceptability remain low among women in many regions.
Methods: This study assessed the awareness, knowledge, and acceptability of HPV vaccination among 355 women attending outpatient departments (OPD) in selected healthcare institutions in Ibadan, Nigeria. Data were collected through a structured questionnaire and analysed using descriptive and inferential statistics.
Results: Only 166(46.8%) of participants had heard of HPV vaccination, and 119(33.5%) were aware that it prevents cervical cancer. Overall, 220(62%) had poor awareness, while 235(66.2%) demonstrated poor knowledge of HPV vaccination. Acceptability was also low, with less than half of the respondents, 160(45.1%), showing a high level of acceptance of the HPV vaccine. Inferential analysis revealed that educational level, occupation, number of female children, and frequency of visits to healthcare facilities were significantly associated with HPV vaccine acceptability ($p<0.05$).
Discussion: The findings highlight a substantial gap in awareness, knowledge, and acceptability of HPV vaccination among women in Ibadan. This underscores the need for targeted public health interventions, including educational programs and community-based awareness campaigns, to improve the acceptability of HPV vaccination. Increased involvement of healthcare providers, alongside efforts to address cultural and logistical barriers, may enhance women's awareness, knowledge, and uptake of the HPV vaccination in Ibadan.

Keywords: *Acceptability; Awareness; Cervical Cancer; Human Papillomavirus; Vaccination; Women.*

1. Introduction

Human papillomavirus (HPV) infection is a major global public health concern due to its association with cervical cancer. Cervical cancer is the fourth most common cancer among women worldwide. More than 5million women developed cervical cancer in a year, of which 85% of this occurred in developing countries [1], [2]. In 2015, cervical cancer in developing countries was 90% of global cases, with a mortality rate that is 18 times higher than that in developed countries, and this is primarily due to inadequate political commitment, cultural factors, and poor health care systems that fail to promptly detect and treat precancerous lesions [3].
Human papillomavirus (HPV) infection remains a major global public health challenge because of its strong link to cervical cancer, a largely preventable disease, but still the fourth most common cancer among women worldwide. Although cervical cancer occurs in all regions, the burden of cervical cancer is high in developing countries, compared to developed countries. More than five million women develop cervical cancer annually, with approximately 85% of cases arising in low- and middle-income countries (LMICs) [1], [2]. Global patterns consistently show that developing countries, particularly in sub-Saharan Africa, bear a disproportionate share of the burden.
As of 2024, the World Health Organization (WHO) identifies sub-Saharan Africa, Central America, and South-East Asia as the regions with the highest incidence and mortality. In contrast, Western Europe, North America, Australia, and parts of Western Asia report substantially lower rates [4]. Women in developing countries experience twice the incidence and three times the mortality of their

counterparts in high-income settings. These stark disparities largely reflect persistent inequalities in access to HPV vaccination, routine screening, and timely treatment.

Beyond health-system capacity, contextual factors such as limited political commitment, socio-cultural beliefs, and weak preventive care infrastructure further widen the gap in cervical cancer outcomes [3]. Even where information is available, the distribution channels differ: in many LMICs, mass media frequently surpass healthcare providers as the primary source of HPV-related awareness. This pattern reflects structural issues such as inadequate provider-patient communication time, workforce shortages, and low integration of cancer prevention into routine healthcare visits. In contrast, high-income countries benefit from stronger primary care systems where screening reminders, school-based vaccination programs, and digital health platforms enhance awareness and uptake.

These global and regional differences highlight why HPV prevention efforts must be tailored to local realities. Addressing the disproportionate cervical cancer burden in LMICs requires not only expanding vaccination and screening services but also strengthening the social and health-system structures that sustain awareness, early detection, and treatment. One of the common causes of cancer-related deaths among women in Nigeria is cervical cancer, after breast cancer, making it the second cause of cancer burden in Nigeria [5]. Cervical cancer is responsible for an average of 60% gynecological cancer out, of which 50% become malignant among women of reproductive age. Cancer registries reveal that in 2012, about 14,089 women in Ibadan and Abuja were diagnosed with cervical cancer. The cases of cancer documented in the Ife-Ijesha cancer registry between 2010 and 2014 documented that 18% of the 2,042 cancers were cancer-related with reproductive organs, and data from the Ido Ekiti cancer registry centre between 2010-2015 reveals 29.9% breast cancer cases and 17.5% of cervical cancer cases [6].

Cervical cancer is a preventable disease through primary prevention of the administration of vaccines against HPV, and secondary prevention of prompt screening for early detection [7]. Vaccination is one major primary preventive measure in reducing the incidence of HPV-related diseases [8]. HPV vaccination has contributed to the decline in the incidence rate of cervical cancer across the nations of the world [9]. However, the uptake of these vaccines remains inadequate in Nigeria due to a combination of socio-economic, cultural, and systemic barriers [10]. HPV vaccination is recommended for girls aged 9–14 years before they become sexually active [11], [3]. For the adolescents to use it, mothers should have knowledge, accept its use, and be ready to adopt it for their children [10]. This underscores the need to assess awareness, knowledge, and acceptability of HPV vaccination, and influencing factors.

This study focuses on women utilising outpatient departments (OPDs) in some selected healthcare facilities in Ibadan. Women utilising outpatient departments in healthcare facilities represent a diverse demographic that interacts frequently with the healthcare system.

2. Methods

2.1. Research design

A descriptive cross-sectional study design was used to assess the awareness, knowledge, and acceptability of HPV vaccination among women utilising outpatient departments of selected health care facilities in Ibadan.

2.2. Study setting

The study was carried out in three (3) selected health care facilities in Ibadan, including the University College Hospital (UCH), Adeoyo State Hospital, Ring Road, and Agbowo Primary Health Care Center. Ibadan, one of the most populous cities in Nigeria, has inhabitants of diverse backgrounds, socio-economic status, and ethnic backgrounds. Ibadan is one of the largest cities in Nigeria, both by geographical size and population. It serves as an important cultural and economic hub in southwestern Nigeria. The city is divided into 11 local government areas (LGAs). These three facilities were selected to ensure the inclusion of women utilising healthcare services at different levels of the healthcare delivery system in Ibadan.

University College Hospital (UCH) is the foremost tertiary healthcare institution in Nigeria, attracting a wide range of patients, including those referred from lower-level healthcare facilities. It provides a wide range of services, including advanced diagnostic procedures, surgical interventions, comprehensive antenatal and postnatal care, and basic healthcare services.

Adeoyo State Hospital, Ring Road, is one of the major secondary healthcare facilities that caters to a significant number of patients from both urban and semi-urban areas. It bridges the gap between primary and tertiary healthcare by managing conditions that do not require the advanced interventions available at tertiary hospitals. It also provides basic healthcare services, antenatal and postnatal care services, making it an essential healthcare provider for women in the city.

Agbowo Primary Health Care Center was selected to ensure representation from women accessing healthcare at the grassroots level. Primary health centers are the first point of contact for many women, particularly those in lower-income communities. As a primary healthcare facility, it provides basic essential health services such as antenatal care, immunization, family planning, treatment of minor ailments, and health education. The center plays a critical role in promoting community health and addressing the basic healthcare needs of the population it serves.

2.3. Study population and sampling technique

The population for the study comprised women utilising the outpatient departments of University College Hospital, Adeoyo State Hospital, and Agbowo Primary Health Care Center. The study sample was calculated using the Yamane sample size formula and considering a 95% confidence level with a 5% error margin, which yielded 356. This sample size was selected using a convenience sampling technique. Convenience sampling is a non-probability sampling method where participants are selected based on their availability and willingness to participate. This approach was chosen due to its practicality in accessing women who were attending the outpatient departments of the selected healthcare facilities within the study period.

Inclusion criteria include attending selected OPD, residing in Ibadan, being 18 years and above, willingness to give consent, and ability to complete the questionnaire

Exclusion criteria includes, Women unwilling to give consent, women who are severely ill to complete the questionnaire, and those who have previously participated in this same study

2.4. Instrument for data collection

We collected data using an interviewer-administered questionnaire. The questionnaire was developed based on the set objectives, review of literature, and guidance of the research supervisor. The questionnaire consists of five (5) sections, addressing the socio-demographic characteristics of study respondents, awareness of women utilising healthcare facilities in Ibadan on HPV vaccination, knowledge of women utilising healthcare facilities in Ibadan on HPV vaccination, acceptability of women utilising healthcare facilities in Ibadan on HPV vaccination, and factors influencing acceptability of HPV vaccines.
The instrument was validated using content and face validity techniques. Content validity of the structured questionnaire was established by giving the instrument to experts who compared each item with relevant literature to ensure that the questions adequately aligned with the study objectives. Face validity was established by presenting the questionnaire to assess the clarity, relevance, and comprehensibility of the items. To ensure the reliability and internal consistency of the instrument, a test-retest procedure was conducted. Ten percent of the questionnaires were administered to women attending the outpatient department of another health facility with similar characteristics to the study setting. The responses from the two administrations were analysed using Cronbach's Alpha reliability coefficient to determine the internal consistency of the instrument. A Cronbach's Alpha value of 0.73 was obtained, indicating that the instrument was reliable.

2.5. Method of data analysis

Data collected were coded, reviewed, and organised to ensure accuracy and completeness. The data collected were analysed using the Statistical Package for Social Sciences (SPSS) version 29. Descriptive statistics such as frequency counts, percentages, mean, and standard deviation were used to summarise and present the results. Inferential statistical techniques, multiple logistic regression was used to test for the association between sociodemographic variables and the level of acceptability of HPV vaccination.

2.6. Ethical consideration

Ethical approval was obtained from the UCH /UI Ethical Review Committee (NHREC/05/01/2008a and Oyo State Ministry of Health NHREC/OYOSHRIEC/10/11/22). The study was conducted in accordance with the ethical standards established in the Declaration of Helsinki. Before data collection, informed consent was obtained from all participants after the purpose, procedures, potential benefits, and possible risks of the study were explained. Participants' privacy and confidentiality were ensured throughout the study. Completed questionnaires were securely stored and accessible only to the research team. All ethical principles guiding human subjects research were strictly observed.

3. Results

Three hundred and fifty-five (355) women utilising the outpatient departments of University College Hospital, Adeoyo state hospital, and Agbowo primary health care center. The calculated sample size is 356, resulting in a response rate of approximately 99.7%. All questionnaires were correctly completed, retrieved, and included in the analysis. The high response rate may be attributed to proper explanation of the study objectives, the use of interviewer-administered questionnaires, and participants' willingness to cooperate.
The age distribution shows that more than one-third, 134(37.7%) of the participants were between 18 and 24 years old, while 90(25.5%) fell within the age range of 45 years and above. A significant proportion, 274(77.2%) of the participants had higher education, and the majority of the participants are self-employed, 109(30.7%). Almost half of the participants, 162(45.7%), had at least one female child. Meanwhile, 185 (52.1%) rarely visit a healthcare facility (Table 1).

Table 1: Sociodemographic Characteristics

Variables	Categories	Frequency	Percentage (%)
Age group	18 – 24	134	37.7
	25 – 34	68	19.2
	35 – 44	63	17.7
	45 and above	90	25.5
Religion	Christianity	278	78.3
	Islam	71	20.0
	Others	6	1.7
Marital Status	Single	170	48.7
	Married	173	47.9
	Widowed	9	2.5
	Divorced	3	0.8
Highest level of education	No formal education	3	0.8
	Primary school completed	3	0.8
	Secondary school completed	75	21.1
	Higher education	274	77.2
Primary occupation	Student	43	12.1
	Unemployed	60	16.9
	Self employed	109	30.7
	Government worker	74	20.8
	Private sector employee	69	19.4
Approximate monthly income in Naira Mean ± sd	Less than 20,000	59	16.6
	20,001 - 50,000	143	40.3
	50,001 - 100,000	100	28.2
	100,001 and above	53	14.9
	67912 ± 51737		
Number of female children	1	162	45.7
	2	44	12.4
	3 and above	149	42.0
Frequency of healthcare facility visit	Frequently (monthly or more)	70	19.7
	Occasionally (2 to 3 times a year)	100	28.2
	Rarely	185	52.1

Awareness of HPV Vaccination

The data from Table 2 showed the responses of women utilising OPD in selected institutions in Ibadan regarding their awareness of HPV vaccination. Less than half, 166(46.8%) of the women had heard of HPV vaccination before, and only 119(33.5%) are aware that it helps prevent cervical cancer. Furthermore, most of the women received information about HPV vaccination from mass media 117(33%), rather than healthcare providers 111(31.3%).

Table 2: Awareness of HPV Vaccination

Variables	Yes	No	Not sure
Ever heard of HPV vaccination before	166(46.8%)	152(42.8%)	37(10.4%)
HPV vaccination helps prevent cervical cancer	119(33.5%)	198(55.8%)	38(10.7%)
Aware that HPV is a virus that can lead to cervical cancer	123(34.6%)	203(57.2%)	29(8.2%)
Informed about HPV vaccination through a healthcare provider	111(31.3%)	204(57.5%)	40(11.3%)
Got information about HPV vaccination through the mass media	117(33.0%)	181(51.0%)	57(16.0%)
HPV vaccination is recommended for girls and young adults	155(43.7%)	160(45.1%)	40(11.3%)
Aware of any government campaigns promoting HPV vaccination	67(18.9%)	239(67.3%)	49(13.8%)
Know where to get vaccinated against HPV in Ibadan	42(11.8%)	271(76.3%)	42(11.8%)
Ever attended a health talk or seminar discussing HPV vaccination	59(16.6%)	261(73.5%)	35(9.9%)
HPV vaccination is not harmful or dangerous	107(30.1%)	99(27.9%)	149(42.0%)

Summary on the level of awareness of HPV vaccination

Figure 1 shows the distribution of women's awareness of HPV vaccination. The mean score was 3.00 ± 3.38. However, the awareness levels were classified using a predefined cut-off point: respondents who scored less than 5 were categorised as having poor awareness, while those who scored 5 or above were categorised as having good awareness. Overall, more than half 220(62%) of the women had poor awareness of HPV vaccination.

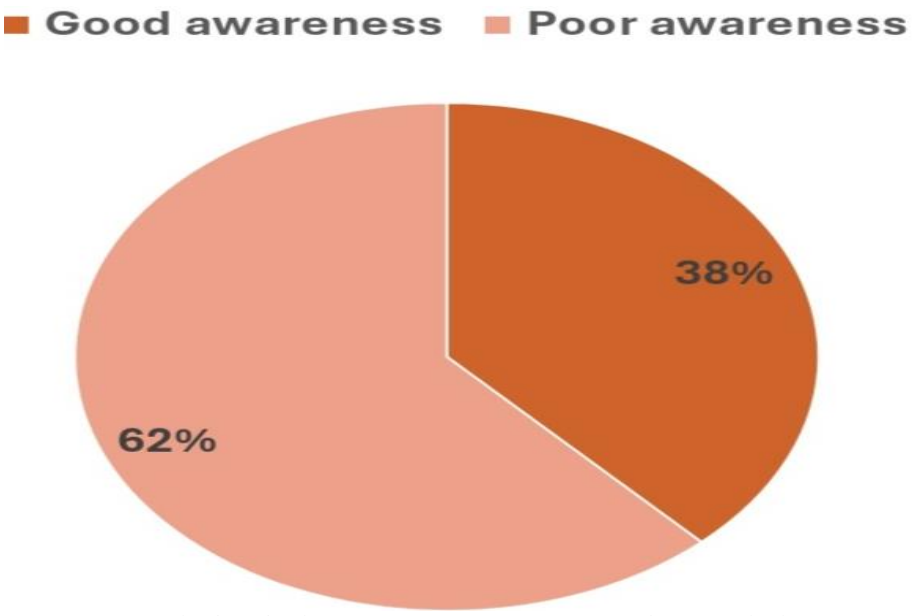

Fig. 1: Pie Chart Showing Summary on Women's Awareness of HPV Vaccination.

Knowledge of HPV Vaccination

Table 3 below shows the responses of women using OPD in selected institutions regarding their knowledge of HPV vaccination. Less than half, 119(33.5%) knew that the HPV vaccine protects against certain types of HPV that cause cervical cancer, and less than half, 108(30.4%) knew that the HPV vaccine is safe and has been approved by international health organizations.

Table 3: Knowledge of HPV Vaccination

Variables	Yes	No	Not sure
The HPV vaccine protects against certain types of HPV that cause cervical cancer	119(33.5%)	39(11.0%)	197(55.5%)
The HPV vaccine is most effective when given before sexual activity begins	84(23.7%)	34(9.6%)	237(66.8%)
The HPV vaccine is safe and has been approved by international health organizations	108(30.4%)	38(10.7%)	209(58.9%)
The HPV vaccine can prevent other cancers, such as anal and throat cancer	38(10.7%)	57(16.1%)	260(73.2%)
The HPV vaccine requires 2 to 3 doses for complete protection, depending on age	62(17.5%)	45(12.7%)	248(69.9%)

Summary on the level of Knowledge of HPV Vaccination

Figure 2 shows the summary of the knowledge of the women on HPV Vaccination. The knowledge mean score was 1.15 ± 1.69. However, the knowledge levels were classified using a predefined cut-off point: respondents who scored less than 5 were categorised as having poor knowledge of HPV vaccination, while those who scored 5 and above were categorised as having good knowledge. A major proportion, 235(66.2%) of the participants had poor knowledge of HPV vaccination.

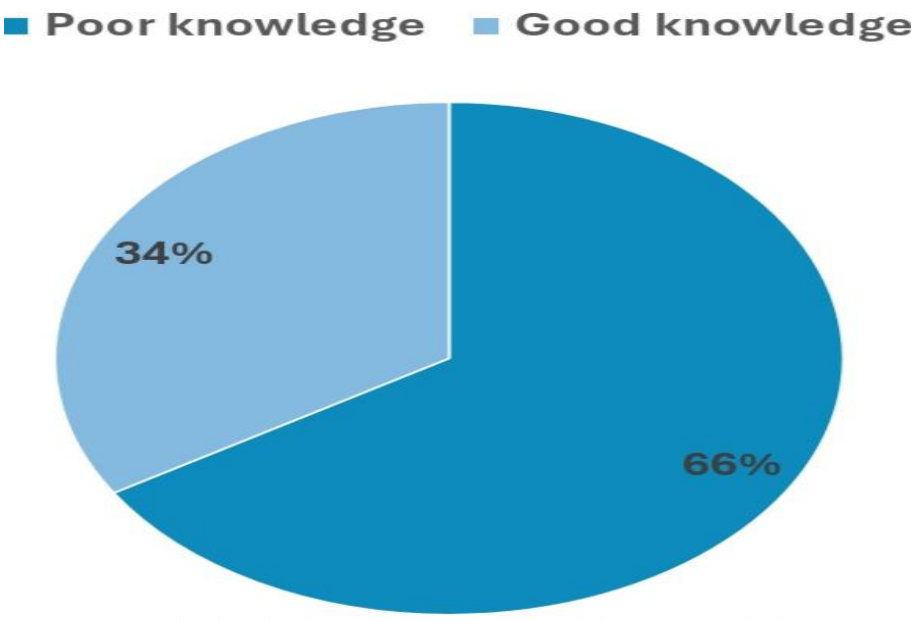

Fig. 2: Pie Chart Showing Summary on Level of Knowledge of HPV Vaccination.

Acceptability of HPV Vaccination

Table 4 below shows the responses of women utilising the outpatient departments of selected institutions regarding their acceptability of HPV vaccination. Less than one-third 60, 16.9%) have received or ever considered getting the HPV vaccine; less than half 174(49%) knew receiving the HPV vaccine is important for women's health; and less than one-third 111(31.3%) indicated willingness to pay for the HPV vaccine if not provided for free. Lastly, more than half 240(67.7%) indicated willingness to take the vaccine if more information and access were provided.

Table 4: Acceptability of HPV Vaccination

Variables	Yes	No	Not Sure
Received or ever considered getting the HPV vaccine	60(16.9%)	272(76.6%)	23(6.5%)
Would allow daughter to receive the HPV vaccine if it were available	188(53.0%)	54(15.2%)	113(31.8%)
Receiving the HPV vaccine is important for women's health	174(49.0%)	40(11.3%)	141(39.7%)
Would recommend the HPV vaccine to other women in the community	186(52.4%)	42(11.8%)	127(35.8%)
Willing to pay for the HPV vaccine if it is not provided for free	111(31.3%)	95(26.8%)	149(42.0%)
Willing to participate in community programs to promote HPV vaccination	186(52.4%)	70(19.7%)	99(27.9%)
The HPV vaccine should be mandatory for pre-adolescents before attending school	108(30.4%)	83(23.4%)	164(46.2%)
Willing to take the vaccine if more information and access were provided	240(67.6%)	38(10.7%)	77(21.7%)

Summary on the level of acceptability of HPV vaccination.

Figure 3 reveals the summary of the level of acceptability of HPV vaccination. The level of acceptability mean score was 3.94 ± 2.32. However, the level of acceptability was classified using a predefined cut-off point: respondents who scored less than 8 were categorised as having non-acceptance of HPV vaccination, while those who scored 8 and above were categorised has high level of acceptance of HPV vaccination.

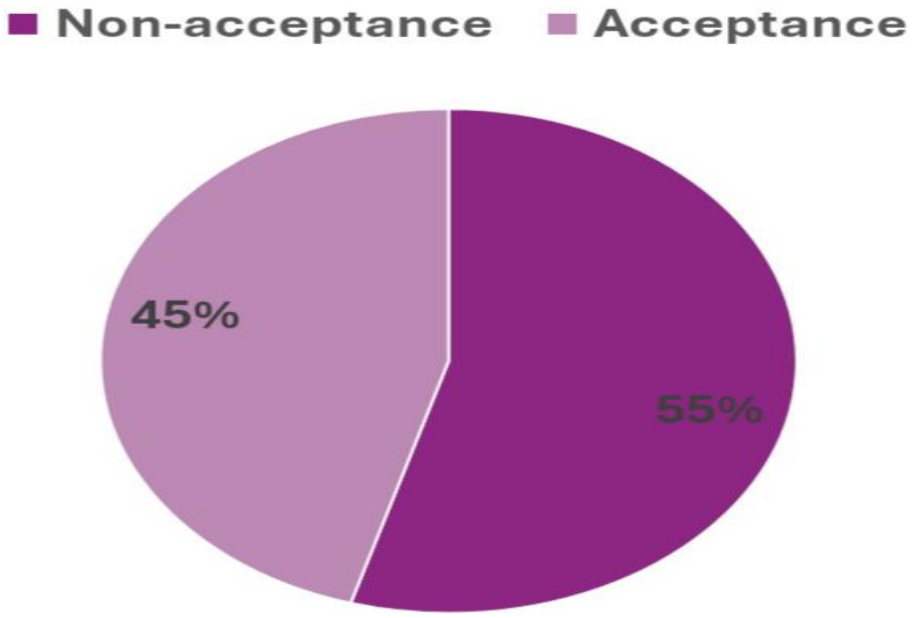

Fig. 3: Pie Chart Showing Summary on Level of Acceptability of HPV Vaccination.

Factors influencing the acceptability of HPV vaccination

The result of the multivariate regression analysis showed that certain sociodemographic variables were significantly associated with the acceptability of HPV vaccination: age, number of female children, and frequency of healthcare facility visits (Table 5).

Age: Age is a significant predictor of the acceptability of HPV vaccination, particularly in the younger age groups. Individuals aged 25 - 34 years were 8.598 times more likely (OR- 8.598, Sig- 0.001) to accept HPV vaccination compared to individuals aged 45 years and above (reference category). However, for age groups 18 - 24 years (OR- 2.779, Sig 0.232) and 35 - 44 years (OR-0.810, Sig - 0.639), there was no significant association with the acceptability of HPV vaccination. These findings suggested that younger women, particularly those below 35 years, were more likely to accept HPV vaccination.

Number of female children: The number of female children was also a significant predictor. Individuals with one female child were 0.234 times less likely (OR = 0.234, Sig = 0.020) to accept HPV vaccination compared to those with three or more children (reference category). However, having two female children (OR = 0.263, Sig = 0.095) or no female children (OR = 1.009, Sig = 0.984) was not significantly associated with vaccine acceptability.

Frequency of healthcare facility visits: Frequency of healthcare facility visits was a significant factor. Those who visited healthcare facilities frequently were 2.767 times more likely (OR = 2.767, Sig = 0.040) to accept HPV vaccination compared to those who visited rarely (reference category). However, occasional visitors (OR = 1.431, Sig = 0.289) did not show significant associations.

Table 5: Multivariate Regression Showing the Association Between Sociodemographic Variables and the Level of Acceptability of HPV Vaccination.

Sociodemographic characteristics	B	Sig	Exp(B)	95% CI for Exp(B)	
				Lower Bound	Upper Bound
Age					
18 - 24	1.022	0.232	2.779	0.520	14.861
25 - 34	2.152	0.001	8.598	2.524	29.289
35 - 44	-0.211	0.639	0.810	0.335	1.955
45 and above	1				
Religion					
Christianity	1.793	0.000	6.008	0.610	4.01
Islam	1.875	0.450	6.520	0.694	6.94
Others	1				
Marital status					
Single	-0.005	0.997	0.995	0.100	9.886
Married	0.893	0.282	2.443	0.480	12.443
Divorced	-1.610	0.998	0.200	0.235	6.496
Widowed	1				
Highest level of education					
Higher education	0.694	0.054	2.001	0.247	1.011
No formal education	1.766	0.997	5.846	0.564	1.234
Primary school completed	1.234	0.997	3.434	0.167	1.346
Secondary school completed	1				
Primary occupation					
Civil servant	1.469	0.041	4.345	0.042	1.265
Student	-0.657	0.462	0.519	0.090	2.980
Trader/Businessperson	0.074	0.927	1.077	0.221	5.254
Others	0.035	0.966	1.035	0.212	5.057
Unemployed	1				
Number of female children					
None	0.009	0.984	1.009	0.417	2.444
1	-1.451	0.020	0.234	0.069	0.797
2	-1.337	0.095	0.263	0.055	1.262
3 and above	1				
Frequency of hospital visit					
Frequently(monthly or more)	1.018	0.040	2.767	0.137	0.955
Occasionally (2 or 3 times a year)	0.359	0.289	1.431	0.738	2.777
Rarely (once a year or less)	1				

Reference categories: Age (45 years and above), Religion (Others), Marital status (Widowed), Education (Secondary school), Occupation (unemployed), Number of female children (3 and above), Frequency of healthcare facility visits (Rarely)

4. Discussion

Recent global reviews have shown that although HPV vaccine coverage has increased worldwide, substantial inequities persist between high-income countries and low- and middle-income countries, largely due to disparities in access, awareness, and health system capacity [12].

It is worth noting that the findings of this current study align with regional trends, as discussed below.

4.1. Awareness of HPV vaccination

The findings of this study revealed that less than half (46.8%) of women attending outpatient departments in selected institutions in Ibadan had ever heard of the HPV vaccine, and only 33.5% were aware that it helps prevent cervical cancer. This level of awareness is consistent with several studies conducted in Nigeria and other sub-Saharan African countries, which also reported low awareness levels. For instance, Yahya et al. [13] found that only 15% of women attending antenatal clinics in northern Nigeria had heard about HPV vaccination, while Ndikom et al. [14] reported awareness of 18% among women receiving care at health facilities in Ibadan. Similarly, Lubeya et al. [15] in Zambia and Isabirye et al. [16] in Uganda documented awareness levels below 30%. The predominance of mass media as the main information source in this study (33%) rather than healthcare providers (31%) further underscores the weak role of health professionals in promoting vaccine information, a trend also observed by Chidinma [17], who noted that women counseled by healthcare workers were

twice as likely to be aware of HPV vaccination. The findings, therefore, affirm that awareness of HPV vaccination in Nigeria remains suboptimal and largely dependent on informal information sources. This has implications for intervention strategies, highlighting the need to empower healthcare workers to be more proactive in communicating HPV-related information.

It is worth noting that less than half of the women in this current study were aware that HPV vaccination is recommended for girls and young adults, and even fewer knew about government campaigns promoting it, highlighting the need for targeted public health campaigns. This resonates with studies from other low- and middle-income countries. For example, Lubeya et al. [15] in Zambia attributed low awareness to a lack of targeted public health campaigns and insufficient training for healthcare workers. Similarly, Ken-Amoah et al. [1] in Ghana stressed the need for culturally sensitive and locally relevant education campaigns. The current study adds further weight to this argument, suggesting that even when campaigns exist, their reach and effectiveness may be limited, implying a need for better design and implementation of such programmes.

In summary, the level of awareness of HPV vaccination is poor, which aligns with the broader picture of low awareness across sub-Saharan Africa. Studies in Uganda [16] and Ghana [1] have reported similarly low levels of awareness, often linked to limited community outreach and inadequate health education strategies. The current study, along with these prior studies, highlights the urgent need for comprehensive public health interventions to improve HPV vaccination awareness in these settings. Interestingly, Chidinma's [17] study in Enugu, Nigeria, highlighted that the healthcare workers can play a pivotal role in raising awareness, suggesting that interventions should focus on training and supporting healthcare providers to engage with women about HPV vaccination. The low awareness found in the current study has significant implications for HPV vaccination uptake, as women who are not aware of the vaccine's existence or benefits are unlikely to seek it out. This shows the need for multi-pronged approaches that combine mass media campaigns, community engagement, and healthcare provider involvement to effectively raise awareness and ultimately improve vaccination rates.

4.2. Knowledge of HPV vaccination

Knowledge of HPV vaccination among participants was generally poor, with two-thirds (66.2%) of women demonstrating inadequate knowledge. Only 33.5% knew that the vaccine protects against cervical cancer, and 23.7% were aware that it is most effective before sexual debut. This pattern aligns with the findings of Yahya et al. [18], who reported that just 10% of women in Northwestern Nigeria could correctly identify the preventive role of the HPV vaccine, and Ndikom et al. [11], who found that only 20% of women knew the correct dosing schedule. This reveals the need for improved communication regarding this crucial aspect of vaccination. Comparable studies in other developing contexts, such as India [16] and Uganda [8], also reported limited knowledge due to inadequate education and communication by health professionals. Conversely, studies from developed nations like Australia and the United States reported higher knowledge levels (over 60%) attributed to structured educational interventions [16,5]. The current study's findings therefore reinforce the literature that insufficient communication and health education in LMICs contribute to persistent knowledge gaps about HPV vaccination. In addition, Ndikom et al. [11] study found that engagement with healthcare workers during antenatal visits can significantly improve knowledge, suggesting that integrating HPV vaccine education into routine healthcare interactions could be a promising strategy.

4.3. Acceptability of HPV vaccination

The findings of this study indicate a generally low level of acceptability of HPV vaccination among the participants. Less than half of the participants expressed a high level of acceptance, with only 16.9% having ever received or seriously considered receiving the vaccine. However, a substantially higher proportion (67.6%) indicated willingness to accept HPV vaccination if adequate information and improved access were provided, suggesting that acceptability may be enhanced through targeted health education and service availability. These findings correspond with earlier Nigerian studies: Agboola et al. [1] reported 55% willingness among urban women in Ibadan, while Owolabi et al. [12] found 40% acceptability among women attending outpatient clinics. Similar moderate levels of acceptance have also been reported in other sub-Saharan countries, including Zambia [10] and Ghana [9]. Nonetheless, the level of acceptability observed in this study remains lower than that reported in high-income countries such as Australia and Canada, where acceptance rates range between 70–85% [2], [16]. The difference may reflect disparities in public trust, access, and government support. The result that many women would accept vaccination if better informed highlights the critical role of awareness creation and health education in improving uptake.

Globally, HPV vaccine acceptability is generally higher among younger women due to early exposure to school-based vaccination programmes and comprehensive sexual health education [3]. However, the lower acceptability observed among younger women in this study may reflect contextual differences within low- and middle-income countries (LMICs), including cultural norms surrounding sexuality, stigma associated with sexually transmitted infections, and misconceptions that HPV vaccination promotes early sexual activity. In addition, younger women may perceive themselves to be at lower risk of cervical cancer, thereby reducing perceived need for vaccination. These factors highlight the importance of culturally sensitive health education strategies that address misconceptions and emphasize the preventive health benefits of HPV vaccination irrespective of sexual activity or age.

The current study also found that fewer than half of the women recognised the importance of receiving the HPV vaccine for women's health. This suggests that although some women may be willing for their daughters or other women to receive the vaccine, they may not fully understand its personal benefits, which could explain the lower personal uptake. Consequently, there is a need for public health campaigns to place greater emphasis on the individual protective benefits of HPV vaccination, particularly in the prevention of cervical cancer. Furthermore, the finding that less than one-third of the women were willing to pay for the vaccine if not provided free of charge suggests a potential financial barrier. This aligns with the findings from other middle-income countries, where cost can be a significant factor in vaccine uptake. These findings have important policy implications, underscoring the need for subsidized or free HPV vaccination programmes to enhance acceptability and improve uptake among women.

Furthermore, the finding that more than half of the women were willing to participate in community programmes to promote HPV vaccination is encouraging. This indicates potential for community-based interventions to enhance vaccine acceptance. The expressed willingness to participate in community programs suggests that existing community structures and networks could be effectively leveraged to support HPV vaccination promotion and improve coverage. In contrast, fewer than one-third of the women indicated that the HPV vaccine should be mandatory for pre-adolescents prior to school enrolment, indicating possible resistance to compulsory vaccination policies. This finding has policy implications, suggesting that a more nuanced approach, focusing on education and persuasion rather than mandatory policies, might be more effective in increasing vaccine uptake.

4.4. Factors influencing acceptability

The study identified age, primary occupation, number of female children, and frequency of healthcare facility visits as significant predictors of vaccine acceptability. Younger age groups (18–34 years) were less likely to accept HPV vaccination compared to older women. This finding contrasts with the work of Singh et al. [16], who observed higher acceptance among younger age groups in Australia and the United States, possibly because of early exposure to school-based vaccination programs. The higher likelihood of acceptance among government workers aligns with findings by Lubeya et al. [10], who reported that women with higher education and formal employment were more likely to support vaccination.

The association between having female children and higher acceptance also corroborates earlier findings [1,18], indicating that mothers with daughters are more motivated to accept the vaccine to protect their children. Furthermore, frequent healthcare visits were positively associated with acceptability, similar to observations by Chidinma [17], who found that women exposed to health talks during clinic visits were twice as likely to accept HPV vaccination.

Overall, these findings confirm that socio-demographic, informational, and healthcare system factors jointly shape vaccine acceptability. They emphasised the need for targeted health education through healthcare workers, increased media engagement, and improved access to vaccination centers to enhance HPV vaccine uptake.

5. Conclusion

This study found that awareness and knowledge of HPV vaccination among women in Ibadan are low, with many unaware of its role in cervical cancer prevention, consistent with other studies across Nigeria and sub-Saharan Africa. In addition, more than half of the women accepted the use of the HPV vaccine.

Age, number of female children, and frequency of health facility visits were significant predictors of HPV vaccination acceptability. Interventions to improve uptake should focus on younger mothers, families without female children, and women who visit health facilities infrequently, using targeted health education and community-based outreach.

Other variables, including religion, marital status, and education, were not statistically significant, probably due to small sample sizes within categories, sparse data, or quasi-complete separation, resulting in unstable regression estimates.

To improve vaccination acceptability and utilisation, targeted interventions should combine mass media campaigns, healthcare provider engagement, and policies to enhance affordability and accessibility. Strengthening the role of healthcare providers, implementing school- and community-based education, and integrating HPV vaccination into existing reproductive health programs could significantly improve vaccine uptake and contribute to cervical cancer prevention in Nigeria.

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