ORIGINAL ARTICLE OPEN ACCESS

Awareness and attitude towards human papillomavirus vaccination among mothers in selected health institutions in Edo State, Nigeria

[1]Osian EA, *[2]Akpojaro E, [1]Elusoji C, [3]Odigie IC

ABSTRACT

Background: Globally, the Human Papillomavirus vaccine is the main preventive tool for HPV-related cancers. Despite the numerous advantages of the HPV vaccine, low utilisation has been reported due to a lack of awareness and a poor attitude towards the vaccine. This study assessed mothers' awareness and attitudes towards human papillomavirus vaccination at selected health institutions in Edo State.
Methods: This was a descriptive cross-sectional study conducted among 305 mothers of childbearing age, purposively selected from those attending the immunisation clinic at selected hospitals in Benin City, Edo State. Data was collected by trained research assistants using an interviewer-administered questionnaire that was validated and pretested in another facility. Questions on socio-demographic characteristics, awareness and attitude towards HPV infection and vaccines were asked. Data was analysed using SPSS version 24.0. Univariate analysis was used to describe the data. And the results were presented in tables and pie charts. Ethical permission was obtained from the Ethics Committee of the University of Benin Teaching Hospital.
Results: Most respondents (59.6%) had low awareness of HPV infection and vaccination, while 27.5% had high awareness. One quarter of the respondents had a negative attitude, while 74.8% had a positive attitude towards HPV infection and vaccination. There was a statistically significant association between age at first sexual debut and awareness level ($\chi^2 \approx 10.485$, $p < 0.033$).
Conclusion: Most respondents had poor awareness and a positive attitude towards HPV infection and vaccination in this study. There is a need for campaigns to raise awareness of HPV infection among mothers.

Keywords: Attitude, Awareness, Infection, Vaccination, Human papillomavirus

INTRODUCTION

Human Papilloma Virus (HPV) infection is the most common sexually transmitted infection. There are over 100 types, with at least 14 being cancer-causing, also known as high-risk types 16 and 18, which cause cervical cancer (1). Types 6 and 11 are more commonly associated with benign lesions and genital warts. It has been reported that over 90% of men and 80% of women will be infected with at least one type of HPV in their lives due to suboptimal HPV vaccination rates (2). Out of the 118 million women immunized against HPV worldwide, only 1% are from low-and middle- income countries (3). In 2018, approximately 300,000 women died from cervical cancer, and more than 85% of these deaths occurred in low- and middle-income countries (4). In Sub-Saharan Africa (SSA), over 75,000 new cases and 50,000 deaths occur every year. It is estimated that 443,000 will die from cervical cancer in 2030 (5). In Nigeria, 36.59 million women aged above 15years are at risk of cervical cancer (6). In Nigeria, HPV related cervical cancer is the most common genital tract malignancy among women (7). Nigeria has the highest HPV prevalence (8). In 2018, 4,089 women were diagnosed with HPV infection, and 8,240 died from cervical cancer; thus, an average of one Nigerian woman dies every one hour from cervical cancer (9).

Lieblong et al. (10) reported in their study that prophylactic HPV vaccination stands to sharply decrease cervical cancer incidence rates. Despite the numerous advantages of the HPV vaccine, low utilization has been reported. This is largely due to a lack of knowledge (11) and a low level of awareness (12). This is largely due to a lack of knowledge (11) and a low level of awareness (12). For instance, studies in Nigeria consistently reveal low awareness regarding HPV and its prophylactic vaccine among caregivers and the general population, which consequently impacts vaccination uptake (6). This limited understanding extends to the link between HPV infection and cervical cancer, even among populations with higher literacy rates (6). Therefore, targeted educational interventions are crucial to bridge this knowledge gap and promote HPV vaccination uptake (13). Given that persistent infection with high-risk HPV types, particularly HPV 16 and 18, is responsible for approximately 70% of cervical cancer

* Correspondence: abrahamjovy@gmail.com
[2]Department of General Studies, Edo State College of Nursing Sciences, Benin City, Edo State
Full list of author information is available at the end of the article

© The Author(s). 2026 Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

cases globally, enhancing public awareness is a critical step toward increasing vaccination rates and mitigating disease burden. Other factors that influence HPV vaccine uptake include socio-cultural, socio-economic, political, religious and institutional factors (14). Since its launch, the awareness of the HPV vaccine has been poor (15). This low awareness significantly contributes to vaccine hesitancy and suboptimal uptake, with HPV vaccination rates for adolescent girls in Nigeria standing at a mere 1.4%, dramatically lower than the 65.1% observed in the United States (16). This disparity is further exacerbated by the absence of universal, government-funded vaccination programs in many low- and middle-income countries, including Nigeria, where only nine of 55 African nations have national anti-cervical cancer programs. Thus, health education intervention was recommended to improve the awareness of HPV infection and vaccination. Health care professionals play a key role in raising awareness, and their attitudes are often critical to gaining mothers' confidence, enabling them to encourage their teenage children and wards to get the HPV vaccine. High public awareness will improve HPV vaccine uptake. Enhancing healthcare providers' knowledge and their proactive communication about HPV vaccination are vital for mitigating vaccine hesitancy, especially given that a lack of doctors' recommendations is a significant barrier to parental acceptance (17). This underscores the critical need for comprehensive training and ongoing medical education for healthcare professionals to ensure the accurate and consistent dissemination of information on HPV and its prophylactic vaccination. This study assessed mothers' awareness and attitudes towards human papillomavirus vaccination at selected health institutions in Edo State, Nigeria.

MATERIALS AND METHODS

Research Design

A facility-based descriptive cross-sectional survey was conducted.

Study Settings

The study was carried out in the University of Benin Teaching Hospital (UBTH), St Philomena Catholic Hospital (SPCH), Benin City and Central Hospital (CH) Benin City. These hospitals were selected because they are referral centres with high patient volume from diverse populations in the state.

Population of the Study

The target population consisted of mothers who attended immunisation clinics between April 1st, 2022, and September 30th, 2022.

Sample Size Determination

The sample size was calculated using the Tar Yamane's formula for comparing proportions.(18)

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- **n** = required sample size
- **N** = total population size
- **e** = level of precision (sampling error), usually:
    - 0.05 (for 95% confidence level)

UBTH 8676/13852×305=191

SPCH 3337/13852×305=73

CH 1839/13852×305=41

A total of 305 participants from the three study settings were obtained after computation of parameters in the formula across the 3 facilities.

Sampling Technique

A purposive sampling technique was used to select study participants based on their availability. This was carried out in each site during immunisation clinic days among participants who met the inclusion criteria until the sample size was obtained.

Inclusion Criteria

- Mothers of childbearing age 18years and above.
- Those who were available during the data collection
- Residents who have lived in Edo State for at least 6 months
- Those who gave consent

Exclusion criteria

- Women who are too ill to give consent
- Women who refuse consent
- Non-residents and residents who have not lived up to 6 months in Edo State.
- Those not within the age range
- Questionnaires that were incompletely filled out or had substantial missing data were excluded from the final analysis.

Instrument for Data Collection

A pretested, structured, interviewer-administered questionnaire with closed-ended questions was used

to collect data from respondents. It had the following subsections, namely.

Section A – Demographic data (10 items)

Section B – Awareness with (20 items)

Section C – Attitude with (8 items)

Validity of the Instrument

The content and face validity of the instrument were assessed by the statistician, an experienced public health nurse, and a mother whose child has received the HPV vaccination. The content was then reviewed by the supervisor.

Reliability of the instrument

Thirty-one (31) questionnaires were administered to mothers at the Irrua Specialist Teaching Hospital. The data collected were analysed using Cronbach's Alpha Statistics and coefficient alpha, yielding a result of 0.820, which was deemed acceptable.

Ethical consideration

Ethical approval was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital, St Philomena Hospital Benin, and Central Hospital, with protocol numbers ADM/E22/A/VOL.VII/1483139, SRECC/2024-03, and A732/T/5. A letter of introduction was provided to the three selected health institutions. Ethical principles following the Helsinki Declaration, such as beneficence and non-maleficence, were upheld, and informed consent was obtained from study participants.

Methods of data collection

The questionnaire was administered by 3 trained research assistants, all nursing students. They were trained for 2 days on the study's objectives and data collection methods. Informed consents (oral and written) were obtained. Questionnaires were administered and retrieved within 30 to 35 minutes. The completion of questionnaires in (UBTH, SPCH & CH) was for a period of four weeks.

Method of Data Analysis

Data was analyzed using SPSS version 24.0. Univariate analysis was used to describe the data. And the results were presented in tables and pie charts. Bivariate analysis was used to assess the association between the dependent and independent variables. Awareness level was categorized into low (0 – 49.9%); moderate (50 – 69.9%; high (70 – 100%) awareness after scoring the responses. While the attitude score was computed from the Likert scale, Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, Strongly Disagree = 1. Minimum score = 8, maximum score = 40 was converted to mean and graded as follows: Mean score above 3.00 (positive attitude) while mean score below 3.00 (negative attitude).

RESULTS

Table 1 shows the socio-demographic characteristics of respondents. The majority [286(93.8%)] of the respondents are married. Most respondents [285(93.8%)] were Christians. Half of them [54(50.5%)] were from the Bini ethnic group, and most respondents [215(70.5%)] had a tertiary level of education. Most of the respondents [216(70.8%)] lived in urban residences. A little over one quarter of the respondents [117 (38.4%)] were self-employed, and some [65 (21.3%)] earned a monthly income above 50,000.00 naira. The majority of the respondents are in the 20- 29-year-old cohort <30 years, years of sexual debut [95(64.2%)] was 20 years and above

Table 2 shows awareness of HPV infection and vaccination. It was reported by majority that of the respondents [171(56.1%)] that condoms can prevent HPV infection. More than half of the respondents [167(54.8%)] reported that antibiotics cannot cure HPV infection. While about half of them [169(55.4%)] reported that the HPV vaccine prevents cervical cancer. While most of the respondents [163(53.4%)] reported that boys and girls can be vaccinated with HPV vaccine. Some (174(57%)] reported that HPV vaccination will not make adolescents want to have sex. Half of the respondents [156(51.1%)] reported that HPV vaccine prevents HPV infection with virtually 100 efficacy.

The majority of the respondents [182(59.6%)] had a low level of awareness. About thirty-nine (12.8%) had a moderate level of awareness, only 27.5% (84) of the respondents had a high awareness level of HPV infection and vaccination (Figure 1).

Table 3 shows respondents' attitudes towards HPV vaccination. HPV vaccine is expensive, with a mean and SD of 3.49±1.086, HPV vaccine has the potential to prevent risk of HPV transmission had a mean and SD of 4.15±0.925, the efficacy of the vaccination warrants its recommendation had a mean and S.D of 4.00±0.948, the right thing for

mothers is to give HPV vaccination to their adolescent children had a mean and S.D of 4.01±0.987. The overall mean shows that the respondents have a positive attitude.

Figure 2 shows the attitude towards HPV vaccination. It shows that 77(25.2%) have negative attitude, while 228(74.8%) have positive attitude.

As shown in table 4, there was a statistically significant association between age at first sexual debut and awareness level ($\chi^2 \approx 10.484$, $p < 0.033$), with respondents who initiated sexual activity before the age of 18 demonstrating lower levels of awareness. However, no statistically significant associations were found between awareness level and other sociodemographic variables such as age, marital status, religion, ethnicity, education, occupation, income, and place of residence ($p > 0.05$). This indicates that awareness of HPV and its vaccination is generally low across different population subgroups.

Table 1: Socio-demographic characteristics of mothers in three immunization clinics in the selected health institutions

Variables	Attributes	Frequency	Percentage
Age group (Years)	<30	142	46.6
	30 – 39	135	44.3
	40 – 49	18	5.9
	50 and above	10	3.3
Marital Status	Married	286	93.8
	Separated	18	5.9
	Divorced	1	0.3
Religion	Christianity	285	93.4
	Islam	14	4.6
	Traditional	6	2.0
	Others	0	0.0
Ethnicity	Bini	154	50.5
	Igbo	66	21.6
	Hausa	17	5.6
	Yoruba	19	6.2
	Others	49	16.1
Level of Education	None	7	2.3
	Primary	6	2.0
	Secondary	77	25.2
	Tertiary	215	70.5
Place of residence	Rural	89	29.2
	Urban	216	70.8
Years at sexual debut	<10	2	1.4
	10 – 19	51	34.5
	20 and above	95	64.2
Occupation	Government sector	77	25.2
	Private sector	73	23.9
	Self-employed	117	38.4
	Unemployed	38	12.5
No of children	1	88	36.8
	2	64	26.8
	3	56	23.4
	4	23	9.6%
	5	8	3.3%
Monthly Income	None	38	12.5
	< N10,000	59	19.3
	N11,000 – 20,000	57	18.7
	N21,000 – 30,000	35	11.5
	N31,000 – 40,000	16	5.2
	N41,000 – 50,000	35	11.5
	> N50,000	65	21.3

Table 2: Awareness of HPV infection and vaccination

Variable	Yes	No	Undecided
Are you aware that HPV vaccination prevents HPV infection?	140(45.9)	103(33.8)	62 (20.3)
Are you aware that HPV vaccination causes just minor side effects?	183(60.0)	76(24.9)	46 (15.1)
Are you aware that HPV vaccine is available in Edo State?	105(34.4)	108(35.4)	92 (30.2)
Are you aware that HPV vaccine protects against all types of cancers associated with HPV infection?	151(49.5)	87(28.5)	67(22.0)
Are you aware that HPV vaccination is beneficial to both boys and girls?	132(43.3)	107(35.1)	66(21.6)
Are you aware that multiple sexual partners can cause HPV infection?	164(53.8)	63(20.7)	78(25.6)
Are you aware that males and females can become infected with HPV without knowing?	95(31.1)	138(45.2)	72(23.6)
Are you aware that HPV vaccination will NOT affect adolescents' fertility?	93(30.5)	80(26.2)	132(43.3)
Are you aware that HPV vaccination prevents penile cancer?	188(61.6)	27(8.9)	90(29.5)
Are you aware that use of condoms can prevent HPV infection?	171(56.1)	57(18.7)	77(25.2)
Are you aware that antibiotics cannot cure HPV infection?	167(54.8)	58(19.0)	80(26.2)
Are you aware that HPV vaccine prevents cervical cancer?	169(55.4)	69(22.6)	67(22.0)
Are you aware that cost of prevention of HPV infection is cheaper than the treatment of cervical cancer?	147(48.2)	83(27.2)	75(24.6)
Are you aware that boys and girls can be vaccinated with HPV vaccine?	163(53.4)	79(25.9)	63(20.7)
Are you aware that cervical cancer kills many young women in their productive years?	101(33.1	120(39.3)	84(27.5)
Are you aware that HPV vaccination will NOT make adolescents want to have sex?	174(57.0)	47(15.4)	84(27.5)
Are you aware that HPV vaccine prevents HPV infection with virtually 100 efficacy?	156(51.1)	74(24.3)	75(24.6)
Are you aware that HPV vaccine is approved for boys and girls from age 9-12	114(37.4)	102(33.4)	89(29.2)
Are you aware that HPV vaccine prevents mouth and throat (oropharyngeal) cancers?	83(27.2)	124(40.7)	98(32.1)
Are you aware that persons above 13-45 can also have HPV vaccination?	135(44.3)	76(24.9)	94(30.8)

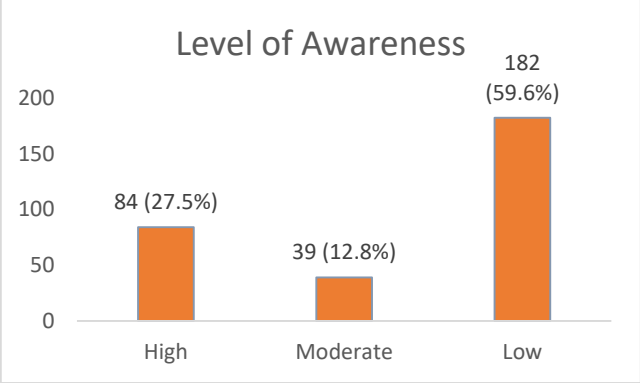


Fig 1: Figure showing the level of awareness of respondents

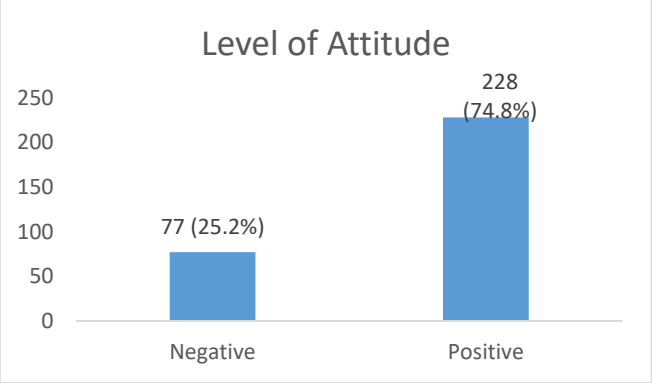


Fig 2: Attitude towards HPV vaccination

Table 3: Attitude towards HPV vaccination

	SD	D	U	A	SA	Mean	SD
HPV vaccine is expensive	19 (6.2)	20 (6.6)	123 (40.3)	79 (25.9)	64 (21.0)	3.49	1.086
HPV vaccination should be recommended for all adolescent males and females	3 (1.0)	1 (0.3)	86 (28.2)	94 (30.8)	121 (39.7)	4.08	0.881
Based on my spouse's sexual lifestyle, I should get HPV vaccination	6 (2.0)	26 (8.5)	118 (38.7)	86 (28.2)	69 (22.6)	3.61	0.991
HPV vaccine has the potential to prevent risk of HPV transmission	2 (0.7)	2 (0.7)	93 (30.5)	60 (19.7)	148 (48.5)	4.15	0.925
I would recommend HPV vaccination because of the seriousness of the diseases associated with HPV infection	1 (0.3)	1 (0.3)	79 (25.9)	80 (26.2)	144 (47.2)	4.20	0.859
The risk/benefit ratio of HPV vaccine will make me recommend it for adolescent children.	0 (0.0)	8 (2.6)	101 (33.1)	73 (23.9)	123 (40.3)	4.02	0.917
The efficacy of the vaccination warrants its recommendation.	7 (2.3)	1 (0.3)	92 (30.2)	91 (29.8)	114 (37.4)	4.00	0.948
The right thing for mothers is to give HPV vaccination to their adolescent children	6 (2.0)	10 (3.3)	80 (26.2)	87 (28.5)	122 (40.0)	4.01	0.987
Grand mean						**3.85**	**0.95**

Table 4: Association between Sociodemographic Characteristics and Awareness Level

Variable	Poor n (%)	Fair n (%)	Good n (%)	χ^2	P
Age					
18–24 (n=65)	16 (24.6)	29 (44.6)	20 (30.8)	1.649	0.949
25–34 (n=116)	19 (16.4)	49 (42.2)	48 (41.4)		
35–44 (n=77)	15 (19.5)	32 (41.6)	30 (38.9)		
45+ (n=47)	9 (19.1)	20 (42.6)	18 (38.3)		
Marital Status					
Single (n=52)	13 (25.0)	23 (44.2)	16 (30.8)	2.38	0.882
Married (n=207)	36 (17.4)	87 (42.0)	84 (40.6)		
Widow (n=26)	7 (26.9)	10 (38.5)	9 (34.6)		
Separated/Divorced (n=20)	4 (20.0)	9 (45.0)	7 (35.0)		
Religion					
Christianity (n=233)	41 (17.6)	98 (42.1)	94 (40.3)	2.289	0.891
Islam (n=52)	13 (25.0)	22 (42.3)	17 (32.7)		
Traditional (n=13)	4 (30.8)	5 (38.5)	4 (30.8)		
Others (n=7)	1 (14.3)	4 (57.1)	2 (28.6)		
Ethnicity					
Bini (n=129)	23 (17.8)	54 (41.9)	52 (40.3)	1.805	0.986
Igbo (n=77)	15 (19.5)	32 (41.6)	30 (38.9)		
Hausa (n=39)	10 (25.6)	17 (43.6)	12 (30.8)		
Yoruba (n=52)	9 (17.3)	22 (42.3)	21 (40.4)		
Others (n=8)	1 (12.5)	4 (50.0)	3 (37.5)		
Level of Education					
None (n=13)	5 (38.5)	5 (38.5)	3 (23.0)	1.556	0.956
Primary (n=39)	13 (33.3)	18 (46.2)	8 (20.5)		
Secondary (n=116)	26 (22.4)	54 (46.6)	36 (31.0)		
Tertiary (n=137)	15 (10.9)	52 (38.0)	70 (51.1)		
Place of residence					
Rural (n=90)	23 (25.6)	41 (45.6)	26 (28.8)	0.426	0.808
Urban (n=215)	36 (16.7)	88 (40.9)	91 (42.4)		
Age at first sex					
<18 (n=52)	13 (25.0)	23 (44.2)	16 (30.8)	10.485	0.033
18–24 (n=142)	26 (18.3)	61 (43.0)	55 (38.7)		
25–34 (n=103)	19 (18.4)	41 (39.8)	43 (41.8)		
≥35 (n=8)	1 (12.5)	4 (50.0)	3 (37.5)		
Number of children					
0 (n=90)	19 (21.1)	39 (43.3)	32 (35.6)	2.802	0.592
1–2 (n=103)	18 (17.5)	44 (42.7)	41 (39.8)		
3–4 (n=64)	13 (20.3)	27 (42.2)	24 (37.5)		
≥5 (n=48)	9 (18.8)	20 (41.7)	19 (39.5)		
Occupation					
Government (n=77)	10 (13.0)	32 (41.6)	35 (45.4)	3.442	0.752
Private (n=103)	19 (18.4)	44 (42.7)	40 (38.9)		
Self-employed (n=90)	19 (21.1)	39 (43.3)	32 (35.6)		
Unemployed (n=35)	11 (31.4)	15 (42.9)	9 (25.7)		
Income					
None (n=39)	10 (25.6)	17 (43.6)	12 (30.8)	8.127	0.087
<₦10,000 (n=65)	16 (24.6)	29 (44.6)	20 (30.8)		
₦11k–20k (n=77)	15 (19.5)	33 (42.9)	29 (37.6)		
₦21k–30k (n=65)	10 (15.4)	27 (41.5)	28 (43.1)		
₦31k–40k (n=26)	4 (15.4)	10 (38.5)	12 (46.1)		
₦41k–50k (n=21)	3 (14.3)	8 (38.1)	10 (47.6)		
>₦50k (n=12)	1 (8.3)	5 (41.7)	6 (50.0)		

DISCUSSIONS

Socio-demographic data

Most respondents were 35 years old. This finding contradicts the report in Paragides, which had a median age of 48 years.

Awareness of HPV Infection and Vaccination

The findings revealed that most of the respondents had a poor level of awareness of HPV infection and vaccination. This aligns with a previous study in Edo State (19) and contrary to the findings in the study conducted by Radhika et al., (20) that revealed that the majority of respondents had very good to excellent awareness. This disparity could be associated with the level of dissemination of HPV infection and vaccine information by health care providers and with government involvement in each country. This finding also aligns with previous studies (6,9,19). Nearly half of the respondents believed that HPV vaccination is effective in preventing HPV infection, aligning with the widely recognized benefit of HPV vaccination in reducing the risk of HPV-related diseases. Moreover, a large number of respondents reported that HPV vaccination causes only minor side effects, reflecting a positive perception of the vaccine's safety, which is crucial for vaccine acceptance (21).

Some of the respondents reported that the HPV vaccine is available in Edo State, potentially indicating limited access to the vaccine within the state, as opined by Ezeanochie et al. (22). Additionally, while an average number of the respondents believed that the HPV vaccine offers protection against all types of cancers associated with HPV infection, it is important to note that the vaccine primarily targets certain HPV strains linked to cervical cancer, although it provides some broader protection.

The perception that HPV vaccination is beneficial to both boys and girls is shared by near average of the total respondents, which aligns with the gender-neutral approach recommended by health authorities for HPV vaccination (23). Furthermore, more than half of the respondents understood that having multiple sexual partners can cause HPV infection, indicating an awareness of one of the primary modes of HPV transmission.

A noteworthy finding is that below an average number of respondents acknowledged that HPV infections can occur without visible symptoms, highlighting the often asymptomatic nature of HPV infections and the importance of vaccination as a preventive measure (24). Additionally, some believed that HPV vaccination would not affect adolescents' fertility, address a common misconception and emphasise the importance of educating the public about the vaccine's safety in this regard. Respondents overwhelmingly recognized the vaccine's preventive potential, with the majority of the respondents reporting that HPV vaccination prevents penile cancer, and a good number of the respondents believing it prevents cervical cancer, which is a primary aim of HPV vaccination programs. Moreover, close to the average number perceived the cost of preventing HPV infection as cheaper than treating cervical cancer, underscoring the economic rationale for investing in HPV vaccination programs.

Respondents' awareness of the severity of cervical cancer is evident, with an unimpressive number of respondents acknowledging that cervical cancer claims the lives of many young women during their productive years. This assertion may be due to inadequate social mobilization and cultural beliefs, which align with the findings of Zhang et al.'s study (25), emphasising the need for awareness campaigns as recommended by the author.

Concerns about HPV vaccination potentially influencing adolescent behavior appear to be dispelled, as a larger than average number of respondents believed that HPV vaccination would not make adolescents more inclined to engage in sexual activity. However, there is some overestimation of the vaccine's efficacy, with an average number of respondents believing it prevents HPV infection with virtually 100% efficacy. Though the vaccine is highly effective, the actual efficacy is slightly lower (24). There was a statistically significant association between age at first sexual debut and awareness level. HPV awareness was uniformly low across respondents, with no significant associations observed between awareness and most sociodemographic factors, indicating systemic gaps in health education rather than demographic disparities (24,26). However, age at first sexual debut was significantly associated with awareness, suggesting that earlier sexual initiation is linked to poorer knowledge and highlighting the need for early, targeted reproductive health education interventions. Furthermore, respondents are aware of age-appropriate vaccination, with some recognising that the HPV vaccine is approved for both boys and girls from ages 9 to 12, aligning with the recommended vaccination age ranges (21). The perception that HPV vaccination can prevent mouth and throat (oropharyngeal) cancers is shared by a lower proportion of the respondents, highlighting the broader benefits of the vaccine (27). Lastly, a little below the average number of respondents believed that individuals aged 13 to 45 can also receive HPV vaccination, indicating an understanding of the potential benefits of vaccination for a broader age range (28). There was a statistically significant association between age at first

Attitude towards HPV Vaccination

Almost all respondents had a positive attitude, which is consistent with results from studies conducted in Argentina, Spain, and Nigeria (29–31). These findings could be attributed to several variables, such as personal disposition, socioeconomic status, education, marital status, culture, and religion. Similar studies have highlighted the influence of parental attitudes on vaccine acceptance (32).

The mean score for the statement "HPV vaccine is expensive" indicates a moderate concern among respondents about the cost associated with HPV vaccination. This finding is consistent with prior research, which has identified cost as a potential barrier to vaccine access, particularly in resource-constrained settings (24). Respondents express a positive attitude towards the universal recommendation of HPV vaccination, as reflected in the mean score for the statement "HPV vaccination should be recommended for all adolescent males and females." This aligns with global consensus and recommendations, emphasising that HPV vaccination is most effective when offered to both genders and can significantly reduce the burden of HPV-related diseases (21). With a good mean score for the statement "Based on my spouse's sexual lifestyle, I should get HPV vaccination," respondents exhibit a moderate level of consideration for personal risk factors. This attitude underscores the importance of individual risk assessment and the potential impact of a partner's sexual behaviour on vaccination decisions. Respondents demonstrate a positive perception of the preventive potential of HPV vaccination, with a relatively high mean score for the statement "HPV vaccine has the potential to prevent the risk of HPV transmission." This attitude reflects an understanding of the vaccine's role in reducing HPV transmission, which is crucial for achieving herd immunity and lowering overall infection rates (27). The strong inclination to recommend HPV vaccination due to the seriousness of diseases associated with HPV infection is evident, with a high mean score. This finding aligns with the recognition that HPV can lead to severe health consequences, including various cancers, and underscores the importance of vaccination as a preventive measure (21). The high mean score for the statement "The risk/benefit ratio of HPV vaccine will make me recommend it for adolescent children" indicates that respondents consider a risk-benefit analysis in vaccination decision-making. Respondents exhibit confidence in the efficacy of HPV vaccination, as indicated in the mean score for the statement "The efficacy of the vaccination warrants its recommendation." This positive attitude reflects trust in the vaccine's ability to provide protection against HPV infection and related diseases. The statement "The right thing for mothers is to give HPV vaccination to their adolescent children" also received a good mean score, which suggested that respondents viewed maternal responsibility as a key factor in HPV vaccination decisions and underscores the role of parents in promoting vaccination uptake among adolescents (32).

The findings from this study revealed that the majority of the respondents hold a positive attitude towards HPV vaccination. This finding is encouraging and suggests a favourable disposition towards HPV vaccination within the surveyed population. Such a positive attitude aligns with the overarching goal of HPV vaccination programs, which aim to increase vaccine acceptance and coverage to reduce the burden of HPV-related diseases. Few respondents exhibited a negative attitude towards HPV vaccination. While this proportion is smaller than that of those with a positive attitude, it is still significant. Negative attitudes towards vaccination could be influenced by various factors, such as the environment, misinformation, concerns about vaccine safety, and cultural belief (28). This finding underscores the importance of addressing and mitigating factors contributing to vaccine hesitancy and negative attitudes. The observed negative attitude towards HPV vaccination is consistent with previous research that has highlighted challenges in promoting vaccine acceptance, particularly in regions with limited awareness and knowledge about HPV and its vaccine, which agrees with the findings in the research carried out by Alsous et al.(27) These challenges often necessitate targeted educational interventions and awareness campaigns to address misconceptions and concerns.

Limitation of the study

A qualitative study would have given a better insights on the attitude of mothers towards HPV vaccination. Moreso, response from study participants is subject to recall bias

CONCLUSION

The majority of respondents had poor awareness and a positive attitude towards HPV infection and vaccination in this study. There is a need for campaigns to raise awareness of HPV infection among mothers.

RECOMMENDATIONS

1. To fill in the existing knowledge gaps, media campaigns and the active involvement of medical professionals in awareness campaigns through health education intervention programs are of importance at the community level.
2. Increasing nurses' knowledge of HPV infections and vaccines can enhance the general public's awareness of HPV infections and acceptance of the prevention techniques.
3. School-based campaigns involving primary and secondary schools, including Parent-Teacher Association meetings, should be implemented by school health nurses.

Funding Statement: This study received no funding

Conflicts of Interest: None

Data availability: Data for this study is available upon request

Acknowledgments: The authors wish to appreciate the management of the facilities and study participants for their support and participation in this study.

Author Contributions: Osian and Ejovi conceptualised the study and collected data. Osian and Elusoji contributed to methodology and data analysis. Ejovi and Odigie contributed to literature review and manuscript drafting. All authors read and approved the final manuscript.

Author Details: [1]Department of Nursing Science, Benson Idahosa University, [2]Department of General Studies, Edo State College of Nursing Sciences, Benin City, Edo State, [3]Well Spring University Benin City, Edo State.

REFERENCES

1. World Health Organization (WHO). Human papillomavirus and cancer [Internet]. 2024 [cited 2026 Feb 21]. Available from: https://www.who.int/news-room/fact-sheets/detail/human-papilloma-virus-and-cancer
2. IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. *Biological agents*. Lyon: International Agency for Research on Cancer; 2012.
3. Bruni L, Albero G, Serrano B, Mena M, Gomez D, Muñoz J, et al. Human papillomavirus and related diseases in Africa. Summary report 17 June 2019 [Internet]. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre); 2019 [cited 2026 Feb 21]. Available from: https://www.scirp.org/reference/referencespapers?referenceid=2764032
4. Beddoe AM. Elimination of cervical cancer: challenges for developing countries. Ecancermedicalscience. 2019;13:975. doi:10.3332/ecancer.2019.975
5. Mboumba Bouassa RS, Prazuck T, Lethu T, Jenabian MA, Meye JF, Bélec L. Cervical cancer in sub-Saharan Africa: a preventable noncommunicable disease. Expert Rev Anti Infect Ther. 2017;15(6):613–627. doi:10.1080/14787210.2017.1322902
6. Bisi-Onyemaechi AI, Chikani UN, Nduagubam O. Reducing incidence of cervical cancer: knowledge and attitudes of caregivers in Nigerian city to human papilloma virus vaccination. Infect Agent Cancer. 2018;13:29. doi:10.1186/s13027-018-0202-9
7. National Cancer Institute. Human papillomavirus (HPV) vaccines [Internet]. 2024 [cited 2026 Feb 21]. Available from: https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-vaccine-fact-sheet
8. Okunade KS, Nwogu CM, Oluwole AA, Anorlu RI. Prevalence and risk factors for genital high-risk human papillomavirus infection among women attending the out-patient clinics of a university teaching hospital in Lagos, Nigeria. Pan Afr Med J. 2017;28:227. doi:10.11604/pamj.2017.28.227.13979
9. Oluwole EO, Idowu OM, Adejimi AA, Balogun MR, Osanyin GE. Knowledge, attitude and uptake of human papillomavirus vaccination among female undergraduates in Lagos State, Nigeria. J Family Med Prim Care. 2019;8(11):3627–3633. doi:10.4103/jfmpc.jfmpc_520_19
10. Lieblong BJ, Montgomery BEE, Su LJ, Nakagawa M. Natural history of human papillomavirus and vaccinations in men: a literature review. Health Sci Rep. 2019;2(5):e118. doi:10.1002/hsr2.118
11. Adam VY, Ibadin SH. Knowledge of human papillomavirus infection and acceptability of HPV vaccination among new intake nursing students in Benin City, Nigeria [Internet]. 2014 [cited 2026 Feb 21]. Available from: https://www.researchgate.net/publication/270453364
12. Adesina KT, Saka A, Lawal SAI, Adesiyun OO, Gobir A, Olarinoye AO, et al. Knowledge, practice and acceptability of HPV vaccine by mothers of adolescent girls in Ilorin, Nigeria. Sudan J Med Sci. 2018;13(1):33–49. doi:10.18502/sjms.v13i1.1687
13. Olubodun T, Ogunsola EA, Coker MO, Olayinka SA, Elegbede WA, Ojediran JO, et al. HPV vaccine knowledge, attitude, and programme satisfaction among parents and caregivers of vaccine recipients in Ogun State, Nigeria. Reprod Health. 2024;21(1):179. doi:10.1186/s12978-024-01913-y
14. Isa Modibbo F, Dareng E, Bamisaye P, Jedy-Agba E, Adewole A, Oyeneyin L, et al. Qualitative study of barriers to cervical cancer screening among Nigerian women. BMJ Open. 2016;6(1):e008533. doi:10.1136/bmjopen-2015-008533
15. Bello OO, Oluwasola TAO, Odukogbe AA. Awareness and attitude towards HPV and its vaccines among market women in Bodija Market, Ibadan. Niger J Med. 2016;25(1):12–17.
16. Kpokiri EE, Wapmuk AE, Obiezu-Umeh C, Nwaozuru U, Gbaja-Biamila T, Obionu I, et al. A designathon to co-create HPV screening and vaccination approaches for mothers and daughters in Nigeria: findings from a community-led participatory event. BMC Infect Dis. 2024;24(1):606. doi:10.1186/s12879-024-09479-7
17. Yusuf KK, Olorunsaiye CZ, Gadanya MA, Ouedraogo S, Abdullahi AA, Salihu HM. HPV vaccine hesitancy among parents and caregivers of adolescents in Northern Nigeria. Vaccine X. 2024;21:100591. doi:10.1016/j.jvacx.2024.100591
18. Bonita R, Beaglehole R, Kjellström T. *Basic epidemiology*. 2nd ed. Geneva: World Health Organization; 2006.
19. Isara AR, Osayi N. Knowledge of human papillomavirus and uptake of its vaccine among female undergraduate students of Ambrose Alli University, Ekpoma, Nigeria. J Community Med Prim Health Care. 2021;33(1):1–10. doi:10.4314/jcmphc.v33i1.6
20. Radhika M, Sadiqunissa S, Ahmed M. Awareness and knowledge of human papilloma virus (HPV) vaccine in

prevention of cervical cancer among medical students. Int J Reprod Contracept Obstet Gynecol. 2018;7(12):5026–5030. doi:10.18203/2320-1770.ijrcog20184960

21. World Health Organization (WHO). Human papillomavirus (HPV) vaccines [Internet]. 2022 [cited 2026 Feb 21]. Available from: https://www.who.int/teams/immunization-vaccines-and-biologicals/diseases/human-papillomavirus-vaccines-(HPV)
22. Ezeanochie M, Olasimbo P. Awareness and uptake of human papilloma virus vaccines among female secondary school students in Benin City, Nigeria. Afr Health Sci. 2020;20(1):45–50. doi:10.4314/ahs.v20i1.8
23. Gamaoun R. Knowledge, awareness and acceptability of anti-HPV vaccine in the Arab states of the Middle East and North Africa Region: a systematic review [Internet]. 2018 [cited 2026 Feb 21]. Available from: https://www.emro.who.int/emhj-volume-24-2018
24. Perlman S, Wamai RG, Bain PA, Welty T, Welty E, Ogembo JG. Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: a systematic review. PLoS One. 2014;9(3):e90912. doi:10.1371/journal.pone.0090912
25. Zhang X, Chen H, Zhou J, Huang Q, Feng XY, Li J. Impact of web-based health education on HPV vaccination uptake among college girl students in Western and Northern China: a follow-up study. BMC Womens Health. 2022;22(1):46. doi:10.1186/s12905-022-01625-0
26. Ezeanochie MC, Olagbuji BN. Human papilloma virus vaccine: determinants of acceptability by mothers for adolescents in Nigeria. Afr J Reprod Health. 2014;18(3):154–158.
27. Alsous MM, Ali AA, Al-Azzam SI, Abdel Jalil MH, Al-Obaidi HJ, Al-Abbadi EI, et al. Knowledge and awareness about human papillomavirus infection and its vaccination among women in Arab communities. Sci Rep. 2021;11:786. doi:10.1038/s41598-020-80834-9
28. Lin W, Wang Y, Liu Z, Chen B, Yuan S, Wu B, et al. Awareness and attitude towards human papillomavirus and its vaccine among females with and without daughter(s) who participated in cervical cancer screening in Shenzhen, China. Trop Med Int Health. 2019;24(9):1054–1063. doi:10.1111/tmi.13283
29. Chaparro RM, Rodríguez B, Maza Y, Moyano D, Hernández-Vásquez A. Factors associated with hindering the acceptance of HPV vaccination among caregivers: a cross-sectional study in Argentina. PLoS One. 2020;15(3):e0229793. doi:10.1371/journal.pone.0229793
30. Villanueva S, Mosteiro-Miguéns DG, Domínguez-Martís EM, López-Ares D, Novío S. Knowledge, attitudes, and intentions towards human papillomavirus vaccination among nursing students in Spain. Int J Environ Res Public Health. 2019;16(22):4507. doi:10.3390/ijerph16224507
31. Ogochukwu TN, Akabueze J, Ezeome IV, Aniebue UU, Oranu EM. Vaccination against human papilloma virus in adolescent girls: mothers' knowledge, attitude, desire and practice in Nigeria [Internet]. 2017 [cited 2026 Feb 21]. Available from: https://www.researchgate.net/publication/314511239
32. Ndikom CM, Oboh PI. Perception, acceptance and uptake of human papillomavirus vaccine among female adolescents in selected secondary schools in Ibadan, Nigeria. Afr J Biomed Res. 2017;20(3):237–244.

How to cite this article: Osian EA, Akpojaro E, Elusoji C, Odigie IC. Awareness and attitude towards human papillomavirus vaccination among mothers in selected health institutions in Edo State, Nigeria. J Basic Appl Med Sci. 2026;6(1):21-30. doi:10.4314/jbams.v6i1.4