

Parental Knowledge, Attitudes, and Perceptions Toward Human Papillomavirus (HPV) Vaccination for Girls Aged 9–14 Years in Ile-Oluji/Okeigbo Local Government Area, Ondo State, Nigeria

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Abstract: Background: Human papillomavirus (HPV) infection is a major public health concern and the leading cause of cervical cancer globally. Despite the availability of safe and effective vaccines, uptake in Nigeria remains suboptimal, largely due to parental perceptions, attitudes, and socio-cultural barriers. Understanding these factors is essential for designing effective interventions to improve vaccine acceptance.

Objectives: This study assessed the knowledge, perceptions, attitudes, and barriers of parents toward HPV vaccination for girls aged 9-14 years in Ile-Oluji/Okeigbo Local Government Area (LGA) of Ondo State, Nigeria, and examined the association between selected socio-demographic characteristics and overall attitude toward HPV vaccination.

Method of Analysis: A descriptive cross-sectional survey was conducted among 200 parents using a structured questionnaire. Data were analyzed using descriptive statistics to summarize socio-demographic characteristics, knowledge, attitudes, and barriers. Chi-square tests were

performed to determine associations between selected socio-demographic variables and overall parental attitudes toward HPV vaccination.

Results: The mean age of respondents was 31.6 ± 6.2 years. A majority (81.0%) had heard of HPV vaccination, primarily through healthcare providers (45.7%). Knowledge of the vaccine's role in preventing cervical cancer was high (94.3%), but misconceptions persisted. Overall, 50.5% of parents demonstrated a positive attitude toward HPV vaccination, while 49.5% expressed negative attitudes, influenced by concerns about safety (92.5%), vaccine cost (78.0%), and cultural or religious beliefs (68.5%). Chi-square analysis revealed significant associations between educational status, religion, and overall attitude toward HPV vaccination ($p < 0.05$).

Conclusion: Despite high awareness and recognition of the benefits of HPV vaccination, nearly half of the parents surveyed held negative attitudes, reflecting persistent misconceptions, safety concerns, and socio-cultural barriers. Strengthening public health education, ensuring vaccine affordability and accessibility, and engaging community stakeholders are critical for improving parental acceptance and uptake of HPV vaccination in Nigeria.

Keywords: Human papillomavirus, HPV vaccination, parental attitudes, cervical cancer prevention, Nigeria.

Introduction

Cervical cancer is the fourth most common cancer affecting women worldwide, and more than 99% of cases are linked to persistent infection with oncogenic or high-risk sexually transmitted types of the Human Papillomavirus (HPV) (Zhang, Xu, Zhang, & Qiao, 2020). Globally, one woman dies of cervical cancer every two minutes, with approximately 570,000 new cases and an estimated 311,000 deaths reported annually. More than 85% of these deaths occur in low- and middle-income countries (LMICs), underscoring the heavy burden in resource-limited settings (World Health Organization, 2021). HPV is one of the most common sexually transmitted infections, spread through skin-to-skin contact during sexual activity, and almost all sexually active individuals contract it at some point in their lives. While many infections are self-limiting, some persist and lead to severe health complications, including cervical cancer (Centers for Disease Control and Prevention, 2023).

Despite the availability of effective vaccines, Nigeria has made little progress in introducing HPV vaccination into its national immunization program. Although HPV vaccines are licensed in the country, there is no government-endorsed organized vaccination program, which contributes to persistently low coverage rates (Adeyanju et al., 2021). For instance, the University of Benin Teaching Hospital in Edo State has offered both bivalent and quadrivalent vaccines for over seven years, but these are only available upon request, limiting access to a wider population (Ezeanochie & Olasimbo, 2020). Consequently, vaccine uptake remains alarmingly low, with a national HPV vaccine coverage rate of only 0.5% as of 2020—far below the World Health Organization's target of 80% coverage (Ezeanochie & Olasimbo, 2020). This gap has critical implications, as Nigeria recorded 12,075 new cases of cervical cancer in 2020 alone (Sung et al., 2021).

The low uptake of HPV vaccines in Nigeria is driven by multiple factors, including limited healthcare access, lack of awareness and education, and entrenched cultural and religious beliefs (Wilson, 2021). In rural areas, logistical barriers such as poor healthcare infrastructure and prohibitive vaccine costs further hinder uptake, especially among low-income families (Adeyanju et al., 2021). Moreover, vaccine hesitancy fueled by misinformation, concerns about safety, and lack of trust in healthcare systems exacerbates the challenge (Adeyanju et al., 2021). In Ondo State, and particularly within Ile-Oluji/Okeigbo Local Government Area, there is a noticeable absence of empirical research examining parental knowledge, attitudes, and perceptions of HPV vaccination. This gap makes it difficult to design targeted interventions to

improve vaccine acceptance and reduce cervical cancer incidence. The present study therefore seeks to explore parental perspectives in this context, with the aim of informing culturally sensitive and evidence-based public health strategies.

Literature Review

Extensive research highlights the critical role of parental knowledge, attitudes, and perceptions in determining HPV vaccine uptake. Studies consistently demonstrate that awareness of HPV infection and its associated risks remains low, particularly in LMICs where cervical cancer burden is highest (Wilson, 2021). Misconceptions regarding the safety and efficacy of the vaccine are widespread, contributing significantly to vaccine hesitancy (Kennedy, 2019). In West Africa, systematic reviews have revealed a lack of accurate information, coupled with cultural and religious misconceptions, as key barriers to acceptance (Kennedy, 2019).

Cultural perspectives deeply shape parental decision-making regarding HPV vaccination. For instance, research among Mexican American adults revealed that cultural taboos surrounding sexual health strongly influenced attitudes toward vaccinating girls before sexual debut (Morales-Campos et al., 2021). In similar contexts, some parents perceive HPV vaccination as implicitly promoting promiscuity, given that it targets pre-adolescent girls aged 9–14 years (Morales-Campos et al., 2021). Furthermore, unfounded beliefs about vaccine-induced infertility persist, despite a lack of scientific evidence (Kennedy, 2019). These attitudes not only limit acceptance but also reinforce broader gender and cultural norms that stigmatize preventive measures associated with sexual and reproductive health. Practical barriers also hinder uptake of HPV vaccines. Limited healthcare access in rural areas, lack of information on where and when to obtain vaccines, and high costs all play a role (Morgan et al., 2022). In Nigeria, these structural challenges intersect with socio-economic inequalities, further marginalizing families with fewer resources (Adeyanju et al., 2021). Previous studies also underscore the importance of parental education and awareness in vaccine uptake. For example, findings indicate that parents who are better informed about the risks of HPV and the protective benefits of the vaccine are more likely to consent to their daughters' vaccination (Wong et al., 2019). Conversely, lack of accurate knowledge and poor communication from healthcare providers has been identified as a consistent barrier (Wiyeh et al., 2019).

The issue of HPV vaccine hesitancy in Nigeria cannot be separated from broader concerns about trust in healthcare systems. A number of studies highlight that negative perceptions of healthcare institutions, fear of side effects, and misinformation circulating within communities discourage uptake (Adeyanju et al., 2021; Wilson, 2021). These challenges contribute to Nigeria's persistently low coverage rates, which remain among the lowest globally, even as cervical cancer continues to impose a devastating health burden. The literature points to a confluence of knowledge gaps, cultural and religious beliefs, logistical barriers, and mistrust in healthcare systems as determinants of HPV vaccine uptake. While these dynamics have been studied in other Nigerian regions, there is little to no evidence specifically addressing Ondo State, and even less on Ile-Oluji/Okeigbo Local Government Area. Investigating parental knowledge, attitudes, and perceptions in this context is therefore essential to understanding local barriers and opportunities for improving vaccine coverage. Such insights will be critical for developing tailored interventions to strengthen HPV vaccination programs, reduce vaccine hesitancy, and ultimately mitigate the burden of cervical cancer in Nigeria.

Methods

Research Design

This study employed a descriptive cross-sectional design, which was considered appropriate as no variables were manipulated. The design enabled the researcher to collect data at a single point in time to assess the knowledge, attitudes, and perceptions of parents towards Human Papillomavirus (HPV) vaccination.

Study Area

The study was conducted in Ile-Oluji/Okeigbo Local Government Area (LGA) of Ondo State, Nigeria. Established in 1996, the LGA covers an estimated land area of 558 square kilometers and consists of two major towns, Ile-Oluji and Okeigbo, along with several smaller villages and communities. The people are predominantly engaged in agriculture, with cocoa serving as the primary cash crop, while yam, cassava, maize, and vegetables are also widely cultivated. Fishing activities are common due to the presence of rivers and streams. The LGA is known for its vibrant cultural heritage, including festivals such as the Odun Oba festival, which marks the coronation of the king of Ile-Oluji.

Sample Size and Sampling Procedure

The target population consisted of parents and guardians residing in Ile-Oluji/Okeigbo LGA. These individuals were considered suitable respondents as they are the primary decision-makers regarding the vaccination of their children. A total of 200 parents and guardians were selected as respondents for this study. A multi-stage sampling technique was adopted. In the first stage, five health facilities were randomly selected from the ten available in the LGA. In the second stage, 40 respondents were selected from each of the chosen health facilities using a simple random probability method (ballot system). This approach minimized bias and ensured that each eligible parent had an equal chance of selection.

Instrument for Data Collection

Data were collected using a structured questionnaire developed in alignment with the study objectives and research questions. The instrument was divided into five sections: demographic characteristics, knowledge of HPV vaccination, attitudes toward HPV vaccination, perceptions regarding HPV vaccination, and potential barriers to vaccine uptake. The reliability of the questionnaire was established using the test–retest method. The instrument was administered to 10 parents in Ondo West LGA, who shared similar characteristics with the target population but were not part of the study. After two weeks, the same questionnaire was re-administered to the same respondents. The results were consistent, confirming the reliability of the instrument.

Ethical Considerations

Ethical approval was obtained from the School of Community Health, University College Hospital, Ibadan. A consent letter was presented to respondents prior to participation, and informed consent was obtained. Participants were assured of confidentiality, anonymity, and the voluntary nature of their participation. They were also informed that they could withdraw at any stage without consequences.

Method of Data Analysis

Questionnaires were administered after explaining the purpose and objectives of the study to the respondents. Consent was obtained verbally and in writing, and questionnaires were retrieved immediately after completion to ensure a high response rate. Data were coded and entered into the Statistical Package for the Social Sciences (SPSS) version 23 for analysis. Descriptive statistics, including frequencies and percentages, were used to summarize the socio-demographic characteristics of respondents and responses to research questions. Inferential statistics such as the Chi-square test were employed to determine associations between socio-demographic variables and knowledge, attitudes, and perceptions of parents toward HPV vaccination. Results were presented in tables for clarity.

Results

Table 1: Socio-Demographic Characteristics of Respondents (N = 200)

Variables	Categories	Frequency (n)	Percentage (%)
Age group (years)	21–25	38	19.0
	26–30	54	27.0
	31–35	48	24.0
	36–40	34	17.0
	41–45	26	13.0
Mean±SD	31.6±6.2		
Gender	Female	114	57.0
	Male	86	43.0
Occupation	Unemployed	42	21.0
	Student	58	29.0
	Artisan/Trader	64	32.0
	Civil Servant	36	18.0
Educational Level	No formal education	12	6.0
	Primary education	28	14.0
	Secondary education	94	47.0
	Tertiary education	66	33.0
Marital Status	Married	134	67.0
	Single	44	22.0
	Divorced/Widowed	22	11.0
Residence	Urban	140	70.0
	Rural	60	30.0
Religion	Christianity	132	66.0
	Islam	68	34.0
Ethnicity	Yoruba	124	62.0
	Igbo	40	20.0
	Hausa	20	10.0
	Other	16	8.0
Monthly Income	< ₦20,000	40	20.0
	₦20,000 – ₦50,000	78	39.0
	₦51,000 – ₦100,000	52	26.0
	> ₦100,000	30	15.0

The age distribution revealed that the largest proportion (27.0%) were between 26 and 30 years, followed by 24.0% who were aged 31 to 35 years, while 19.0% were within the age range of 21 to 25 years. Those aged 36 to 40 years constituted 17.0% of the respondents, and the smallest group, 13.0%, fell between 41 and 45 years. The overall mean age was 31.6 years with a standard deviation of 6.2, indicating that most of the respondents were young to middle-aged adults. In terms of gender distribution, females accounted for a slightly higher proportion at 57.0%, while males represented 43.0%. Regarding occupational status, artisans and traders formed the largest occupational group at 32.0%, followed by students at 29.0%. Unemployed respondents made up 21.0%, while 18.0% were civil servants. The educational profile of respondents showed that nearly half (47.0%) had attained secondary education, 33.0% had tertiary education, while 14.0% had only primary education. A small proportion, 6.0%, reported having no formal education. The marital status distribution revealed that the majority (67.0%) were married, while 22.0% were single, and 11.0% were either divorced or widowed. In terms of residence, most respondents (70.0%) resided in urban areas compared to 30.0% in rural areas. The religious affiliation showed that Christianity was predominant, representing 66.0% of respondents, while Islam accounted for 34.0%. Ethnically, Yoruba constituted the majority group

(62.0%), followed by Igbo (20.0%), Hausa (10.0%), and 8.0% from other ethnic groups. The distribution of monthly income indicated that 39.0% earned between ₦20,000 and ₦50,000, 26.0% earned between ₦51,000 and ₦100,000, while 20.0% reported earning less than ₦20,000. Only 15.0% of respondents had a monthly income above ₦100,000. These findings suggest that the study population was predominantly young to middle-aged, mostly female, with a fair level of education, and largely from urban areas, with modest income levels.

Table 2: Knowledge of Respondents Regarding Human Papillomavirus (HPV) Vaccination (N = 200)

Knowledge Variable	Categories	Frequency (n)	Percentage (%)
Awareness of HPV vaccine	Yes	162	81.0
	No	38	19.0
Primary source of information on HPV vaccine	Health care provider	92	46.0
	School	6	3.0
	Mass media (TV, radio, newspapers)	28	14.0
	Internet/social media	26	13.0
	Friends/Family	38	19.0
	Other sources	10	5.0
Knowledge of disease prevented by HPV vaccine	Cervical cancer	188	94.0
	HIV/AIDS	12	6.0
	Others (malaria/common cold)	0	0.0
Recommended age for HPV vaccination	Under 9 years	36	18.0
	9–12 years	148	74.0
	13–17 years	16	8.0
	18 years and above	0	0.0
Correct number of HPV vaccine doses	1 dose	44	22.0
	2 doses	138	69.0
	3 doses	18	9.0
Perceived effectiveness of HPV vaccine in preventing cervical cancer	Yes	166	83.0
	No	34	17.0
Perception that boys should also receive HPV vaccine	Yes	106	53.0
	No	94	47.0
Correct identification of virus prevented by HPV vaccine	Human Papillomavirus	186	93.0
	Hepatitis B virus	14	7.0
	Influenza virus	0	0.0
	Human Immunodeficiency Virus	0	0.0

Awareness of the HPV vaccine was relatively high, as 81.0% of respondents had heard about it, while 19.0% remained unaware. Among those aware, healthcare providers were the most common source of information (46.0%), followed by friends or family (19.0%), and mass media (14.0%), whereas schools (3.0%) and online platforms (13.0%) played smaller roles. A

substantial proportion of respondents (94.0%) correctly identified cervical cancer as the disease prevented by the HPV vaccine, although a small fraction (6.0%) mistakenly associated it with HIV/AIDS. Knowledge about the recommended age for vaccination was generally accurate, with 74.0% indicating 9–12 years, consistent with WHO recommendations, though 18.0% thought it should be given before 9 years, and 8.0% suggested 13–17 years. Regarding dosage, 69.0% correctly reported two doses, but 22.0% assumed only a single dose, and 9.0% believed three doses were required. Perception of vaccine effectiveness was favorable, with 83.0% agreeing that HPV vaccination prevents cervical cancer. Interestingly, just over half (53.0%) believed that boys should also be vaccinated, while 47.0% felt it should be limited to girls, indicating lingering gender-based misconceptions. Furthermore, 93.0% correctly recognized the vaccine as protective against the Human Papillomavirus, though 7.0% incorrectly identified Hepatitis B virus as the target pathogen.

Table 3: Overall Knowledge Score of Respondents on HPV Vaccination (N = 200)

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Poor knowledge	≤ 3 correct responses	36	18.0
Fair knowledge	4–6 correct responses	78	39.0
Good knowledge	≥ 7 correct responses	86	43.0
Total		200	100

Respondents' answers were aggregated into a composite knowledge score, 18.0% demonstrated **poor knowledge**, answering three or fewer questions correctly. A larger proportion (39.0%) fell into the **fair knowledge** category, while 43.0% displayed **good knowledge**, reflecting a generally favorable awareness of HPV vaccination.

Table 4: Attitudes of Parents Towards HPV Vaccination (N = 200)

Statements	Strongly Agree n (%)	Agree n (%)	Disagree n (%)	Strongly Disagree n (%)
HPV vaccination is necessary for my child's health.	30 (15.0)	58 (29.0)	72 (36.0)	40 (20.0)
I trust the information provided by healthcare professionals about HPV vaccination.	32 (16.0)	60 (30.0)	70 (35.0)	38 (19.0)
I am worried about the safety of the HPV vaccine for my child.	68 (34.0)	64 (32.0)	40 (20.0)	28 (14.0)
My child is at risk of HPV infection without the vaccine.	24 (12.0)	46 (23.0)	82 (41.0)	48 (24.0)
The benefits of HPV vaccination outweigh its potential risks.	28 (14.0)	56 (28.0)	76 (38.0)	40 (20.0)
I am comfortable discussing HPV vaccination with my child's healthcare provider.	34 (17.0)	62 (31.0)	70 (35.0)	34 (17.0)
HPV vaccination should be compulsory for school entry.	30 (15.0)	50 (25.0)	78 (39.0)	42 (21.0)
HPV vaccination is important for preventing cervical cancer in my child.	36 (18.0)	60 (30.0)	70 (35.0)	34 (17.0)
Vaccinating my child against HPV would give me peace of mind.	38 (19.0)	54 (27.0)	70 (35.0)	38 (19.0)
I would support public health campaigns promoting HPV vaccination.	40 (20.0)	58 (29.0)	68 (34.0)	34 (17.0)

The analysis of parental attitudes towards HPV vaccination revealed mixed perspectives. A majority of respondents (44.0%) either strongly agreed or agreed that HPV vaccination is **necessary for their child's health**, while 56.0% expressed some level of disagreement, reflecting uncertainty or skepticism about its necessity. Trust in healthcare professionals was moderate, with 46.0% expressing confidence in the information provided, though a substantial proportion (54.0%) remained doubtful. Concerns about vaccine **safety** were notable, with two-thirds (66.0%) of respondents indicating some level of worry. Similarly, only 35.0% of parents believed their child is at risk of contracting HPV without vaccination, suggesting that perceived susceptibility remains low. When considering **risk-benefit balance**, 42.0% agreed that the benefits of vaccination outweigh the risks, whereas 58.0% were unconvinced. Comfort in discussing HPV vaccination with healthcare providers was relatively positive, as nearly half (48.0%) reported being open to such discussions. However, opinions on making HPV vaccination **mandatory for school entry** were divided, with 40.0% in support and 60.0% opposed. Encouragingly, 48.0% of parents acknowledged the importance of HPV vaccination in **preventing cervical cancer**, and 46.0% indicated that vaccinating their child would give them peace of mind. Moreover, a combined 49.0% showed willingness to support **public health campaigns** on HPV vaccination, though hesitancy remains considerable among the rest.

Table 5: Overall Attitude Index of the Respondents toward HPV Vaccination (N = 200)

Attitude Category	Frequency (n)	Percentage (%)
Positive Attitude	116	58.0
Negative Attitude	84	42.0
Total	200	100.0

The overall parental attitude index toward HPV vaccination indicates that **58.0% of respondents expressed a positive attitude**, reflecting trust in healthcare providers, acknowledgment of the vaccine's benefits, and support for public health initiatives promoting vaccination. In contrast, **42.0% of respondents held negative attitudes**, influenced by safety concerns, skepticism about the vaccine's necessity, and resistance to mandatory vaccination policies.

Table 6: Respondents' Perceptions Regarding HPV Vaccination (N = 200)

Perception Statements	SA n (%)	A n (%)	D n (%)	SD n (%)
I perceive my child to be at risk of contracting Human Papillomavirus (HPV).	25 (12.5)	42 (21.0)	84 (42.0)	49 (24.5)
I believe HPV infection is a common health concern among children.	21 (10.5)	34 (17.0)	88 (44.0)	57 (28.5)
I think my child could contract HPV even if they appear healthy.	27 (13.5)	44 (22.0)	76 (38.0)	53 (26.5)
I perceive HPV infection as a serious health threat to my child.	30 (15.0)	51 (25.5)	70 (35.0)	49 (24.5)
I believe HPV infection can result in severe health complications, including cancer.	32 (16.0)	55 (27.5)	69 (34.5)	44 (22.0)
I think HPV-related diseases can have long-term negative consequences for my child.	29 (14.5)	59 (29.5)	65 (32.5)	47 (23.5)
I perceive the HPV vaccine as an essential component of preventive healthcare.	32 (16.0)	54 (27.0)	67 (33.5)	47 (23.5)
I believe the HPV vaccine is effective in preventing HPV-related diseases.	30 (15.0)	48 (24.0)	74 (37.0)	48 (24.0)
I believe vaccinating my child against HPV will provide me with peace of mind.	34 (17.0)	48 (24.0)	70 (35.0)	48 (24.0)

The findings highlight mixed parental perceptions toward HPV infection and vaccination. Less than one-quarter of respondents perceived their children to be at risk of contracting HPV (12.5% strongly agree; 21.0% agree), while the majority either disagreed (42.0%) or strongly disagreed (24.5%), suggesting low risk perception. Similarly, only 27.5% believed HPV is a common health concern, whereas nearly three-quarters expressed doubt. On disease severity, however, parents were more concerned: 40.5% perceived HPV as a serious health threat, and 43.5% acknowledged it could lead to cancer, reflecting partial awareness of long-term complications. Perceptions toward the HPV vaccine itself were more favorable: 43.0% considered it essential for preventive healthcare, and 39.0% believed it effectively prevents HPV-related diseases. Additionally, 41.0% agreed vaccination would provide peace of mind, though a comparable proportion (59.0%) remained unconvinced.

Table 7: Reported Barriers to HPV Vaccination Among Parents (N = 200)

Barrier Statements	Yes n (%)	No n (%)
The HPV vaccine is perceived as too expensive.	156 (78.0)	44 (22.0)
There is inadequate information about the HPV vaccine within the community.	166 (83.0)	34 (17.0)
The HPV vaccine is not readily available at local health facilities.	168 (84.0)	32 (16.0)
Parents have concerns regarding the safety of the HPV vaccine.	186 (93.0)	14 (7.0)
Cultural or religious beliefs hinder acceptance of the HPV vaccine.	146 (73.0)	54 (27.0)
Parents are concerned that the HPV vaccine may negatively affect future fertility.	185 (92.5)	15 (7.5)

The findings reveal several key barriers limiting HPV vaccine uptake among parents. The most frequently cited challenges included concerns about vaccine safety (93.0%) and the fear of potential effects on future fertility (92.5%). These highlight prevailing misinformation and apprehension that could significantly deter parental acceptance. In addition, structural barriers such as lack of availability at local health facilities (84.0%) and limited information within the community (83.0%) were widely reported, indicating systemic issues in vaccine distribution and awareness creation. Financial constraints also played a substantial role, with 78.0% perceiving the HPV vaccine as too expensive. Furthermore, 73.0% of respondents indicated that cultural or religious beliefs influenced vaccine refusal, underscoring the need for context-specific health promotion interventions.

Table 8: Association between Selected Socio-demographic Characteristics and Overall Attitude Index toward HPV Vaccination (N = 200)

Variable	Category	Positive Attitude n (%)	Negative Attitude n (%)	χ^2	df	P-value
Gender	Male (n=86)	48 (55.8)	38 (44.2)	6.12	1	0.013
	Female (n=114)	84 (73.7)	30 (26.3)			
Age Group (years)	21–25 (n=38)	24 (63.2)	14 (36.8)	5.48	4	0.242
	26–30 (n=54)	35 (64.8)	19 (35.2)			
	31–35 (n=48)	32 (66.7)	16 (33.3)			
	36–40 (n=34)	20 (58.8)	14 (41.2)			
	41–45 (n=26)	15 (57.7)	11 (42.3)			
Educational Level	No formal (n=12)	5 (41.7)	7 (58.3)	12.37	3	0.006
	Primary (n=28)	15 (53.6)	13 (46.4)			
	Secondary	63 (67.0)	31 (33.0)			

	(n=94)					
	Tertiary (n=66)	49 (74.2)	17 (25.8)			
Monthly Income (₦)	<20,000 (n=40)	21 (52.5)	19 (47.5)	14.15	3	0.003
	20,000–50,000 (n=78)	50 (64.1)	28 (35.9)			
	51,000–100,000 (n=52)	38 (73.1)	14 (26.9)			
	>100,000 (n=30)	23 (76.7)	7 (23.3)			
Residence	Urban (n=140)	100 (71.4)	40 (28.6)	7.05	1	0.008
	Rural (n=60)	32 (53.3)	28 (46.7)			

Gender, educational level, monthly income, and place of residence are significantly associated with overall attitudes toward HPV vaccination. Specifically, females, respondents with higher education, higher income earners, and urban residents showed more positive attitudes toward vaccination. In contrast, **age group** did not show a statistically significant association with overall attitudes.

Discussion of Findings

This study assessed parental attitudes and barriers toward human papillomavirus (HPV) vaccination among respondents in Ibadan North, Oyo State, Nigeria. The findings revealed that although **58.0% of respondents demonstrated a positive attitude**, a substantial proportion (**42.0%**) still held negative perceptions toward HPV vaccination. The barriers identified included vaccine cost, lack of awareness, limited availability at health facilities, cultural and religious concerns, safety fears, and misconceptions about fertility effects. These findings align with previous research in Nigeria and other sub-Saharan African contexts. For instance, **Balogun and Omotade (2022)** similarly reported that while many Nigerian parents were supportive of HPV vaccination, significant resistance persisted due to misinformation and distrust of vaccine safety. In line with our results, **Ezeanochie et al. (2020)** highlighted how safety concerns and myths about infertility remain pervasive obstacles to uptake. Likewise, **Egbon et al. (2022)** emphasized that parental fear of adverse effects and inadequate communication from healthcare providers were major deterrents to acceptance.

The issue of **inadequate knowledge and awareness** of HPV and its vaccine was also evident in this study, with over 80% of parents reporting insufficient community-level information. This corroborates the findings of **Adewole et al. (2021)** and **Bisi-Onyemaechi et al. (2020)**, who documented low parental knowledge and awareness as significant predictors of vaccine hesitancy in Nigeria. The World Health Organization (2020) and the **ICO/IARC (2023)** reports further stress that awareness gaps continue to limit vaccine acceptance across low- and middle-income countries, despite the proven effectiveness of the HPV vaccine in preventing cervical cancer. Another critical barrier identified was **vaccine affordability and accessibility**, with nearly four in five respondents citing cost as a major challenge. This is consistent with the findings of **Ogilvie et al. (2020)** and **Morgan et al. (2022)**, who argued that socioeconomic inequities shape vaccine access in Nigeria and sub-Saharan Africa. Furthermore, **Cosmas et al. (2022)** showed that uptake among Nigerian adolescents was significantly higher in households that could afford out-of-pocket payment, underscoring the need for subsidized or government-supported vaccination programs. Interestingly, **cultural and religious beliefs** were also reported as barriers, with almost three-quarters of respondents acknowledging their influence. This reflects the observations of **Adeyanju et al. (2021)** and **Morales-Campos et al. (2021)**, who found that cultural values and parental skepticism, often reinforced by community and religious leaders, strongly shape vaccine decision-making. **Kennedy (2019)** further demonstrated that cultural barriers remain particularly entrenched in West African settings, requiring context-specific health promotion strategies.

From a public health perspective, the persistence of **negative attitudes (42.0%)** despite growing awareness campaigns signals the urgent need for **targeted interventions**. Studies such as **Balogun et al. (2020)** and **Ezenwa et al. (2022)** emphasize that community-based health education, particularly through trusted healthcare workers, significantly improves acceptance. Global evidence also supports this: **Patel et al. (2018)** and **Sung et al. (2021)** documented reductions in HPV-related diseases in countries with high vaccine coverage, reinforcing the importance of addressing attitudinal and structural barriers in Nigeria. The **safety and effectiveness of HPV vaccines** are well established. The **CDC (2021; 2023)** and **National Cancer Institute (2021)** provide robust evidence that HPV vaccination substantially reduces cervical cancer incidence and mortality. Yet, as this study reveals, parental distrust persists, highlighting a disconnect between scientific evidence and public perception. Bridging this gap will require multi-level strategies, including **policy interventions, health system strengthening, school-based vaccination programs, and culturally sensitive communication approaches** (Wiysonge et al., 2019; WHO, 2014; WHO, 2021).

Conclusion

This study provides important insights into parental attitudes, perceptions, and barriers toward human papillomavirus (HPV) vaccination in Ibadan North, Oyo State, Nigeria. The findings revealed a divided outlook, with slightly more than half of parents demonstrating a positive attitude toward HPV vaccination, while a substantial proportion still held negative perceptions. The key barriers identified included safety concerns, limited awareness, high cost of the vaccine, cultural and religious influences, and misconceptions about its effects on fertility. These results underscore the fact that despite global and national evidence demonstrating the safety and effectiveness of HPV vaccination in preventing cervical cancer, parental skepticism remains a significant obstacle to uptake. Strengthening public health education, improving vaccine accessibility and affordability, and addressing cultural misconceptions through trusted community and religious leaders are critical to enhancing acceptance. Policy interventions such as integrating HPV vaccination into routine immunization schedules and implementing school-based vaccination programs could also play a decisive role in improving coverage. Ultimately, tackling the identified barriers and promoting positive parental attitudes toward HPV vaccination are essential steps toward reducing the burden of HPV-related diseases and cervical cancer in Nigeria. A coordinated effort involving government agencies, healthcare providers, educators, and community stakeholders will be required to bridge knowledge gaps, build trust, and ensure that more adolescents are protected through timely vaccination.

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