African Journal of
Medicine, Surgery and Public Health Research

ISSN : 3434-3567

Index: Harvard, Boston, Sydney University, Dimensions, Lens, ResearchGet Scilit, Semantic, Google Scholar, Base etc

https://doi.org/10.58578/AJMSPHR.v2i1.4536

Responsiveness and Acceptability for Human Papilloma Virus (HPV) Vaccine Among Parents of Adolescent Girls in Port Harcourt City, Rivers State

Bright-Okere Ugochi N & Imarenezor Edobor Peter Kenneth
National Open University of Nigeria; Federal University Otuoke, Bayelsa State, Nigeria
imarenezorep@fuotuoke.edu.ng

Article Info:

Submitted:	Revised:	Accepted:	Published:
Oct 27, 2024	Nov 15, 2024	Nov 27, 2024	Jan 1, 2025

Abstract

Human Papilloma Virus (HPV) infections and cervical cancer in Nigeria is of high prevalence. Despite this, the acceptance and utilization of the HPV vaccine which has a high effective preventive measure remain low. The aim of the study was to examine the responsiveness and acceptability of the human papilloma virus (HPV) vaccine among parents of adolescent girls in Rivers State, particularly Port Harcourt City. A descriptive cross-sectional study was adopted for this study. A multi-stage sampling method was used for recruiting a total of three hundred and fifty-seven (357) parents with one hundred and eighty (180) males and one hundred and seventy-seven (177) females used in the study across different age groups (21–60) years for the investigation. The results data obtained using an interviewer based semi-structured questionnaire and the Statistical Package for the Social Sciences (SPSS) version 29 was used in the data analysis. The findings disclosed varying degrees of awareness and understanding of HPV, cervical cancer, and the HPV vaccine, with healthcare providers being the primary source of information 120 (33.6%). Cultural beliefs and religious factors significantly affect vaccine acceptance by 180

AJMSPHR Journal is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License

(50.4%) and 120 (36.4%) respectively. In terms of Responses on attitude and perceptions regarding safety and efficacy of HPV vaccine, 210 (58.8%) are aware and ready to accept the vaccine, 70 (19.6%) are not ready to take the vaccine while 77 (21.6%) are not sure if they are ready to accept the vaccine. Barriers like cost and accessibility also influence willingness to vaccinate, as findings showed majority of the participants feel the high cost, location and availability of the vaccines is an issue. Statistically, a positive and statistically significant correlation ($r = 0.230$, $p < 0.01$) was found between cultural beliefs in the community and the likelihood of vaccinating daughters if religious leaders encourage it. On the other hand, the correlation between cultural beliefs and perceived affordability of the HPV vaccine were negative ($r = -0.115$, $p < 0.05$), indicating that parents who consider cultural beliefs in their decision-making may also perceive the vaccine as less affordable, potentially limiting access for financially constrained families. Similarly, there is a positive correlation between the likelihood of vaccinating if religious leaders encourage it and the perceived affordability of the vaccine ($r = 0.187$, $p < 0.01$). This suggests that religious influence may reduce the perceived financial barrier, perhaps by increasing the perceived importance of vaccination among parents. Interestingly, the perceived affordability of the vaccine is also negatively correlated with refraining from healthcare services This study in all, revealed important influences between socio-cultural, economic, and service delivery elements in shaping vaccine uptake and emphasizes the need for enhanced education, reduced logistical obstacles, and a focus on addressing cultural concerns to improve both acceptability and accessibility of the HPV vaccine in the study area. Also, the result provides essential baseline data on HPV prevalence among individuals in Port Harcourt City, highlighting the need for continued surveillance and targeted interventions in this area to reduce the risk of HPV transmission.

Keywords: Adolescent, Girls, Human Papilloma Virus, Responsiveness, Port Harcourt, Vaccine

INTRODUCTION

Cervical cancer is one of the severe life-threatening illnesses in women, which is preventable through the vaccination of adolescent girls prior to exposure with doses of the human papilloma virus (HPV) (Enebe, et al., 2021). Human papilloma virus (HPV) is a major public health concern due to its association with various cancers, particularly cervical cancer which remains one of the leading causes of cancer-related deaths among women globally, especially in low-and middle-income countries (LMICs) such as Nigeria. Annually,

528,000 women around the world are diagnosed of cervical cancer of which over 50% die from it. Although Nigeria's population is about 1% of the world's population, she contributes 10% of the global cervical cancer burden (Imarenezor et al., 2023, Anyaka, et al. 2024; Enebe, et al. 2021). In recent years, HPV vaccination has been recognized as a critical tool in preventing HPV infections and related cancers. According to a factsheet from International Agency for the research of Cancer as published by Asempah (2021), Nigeria as of 2020 has the highest cervical cancer mortality in Africa. Irrespective of the above, the availability and proven efficacy of the HPV vaccine, there are significant gaps in vaccination coverage, in Nigeria and other developing countries. Understanding the responsiveness and acceptability of the HPV vaccine, particularly among parents of adolescent girls, is crucial to attaining 90% HPV vaccine coverage rate and curtailing the prevalence of cervical cancer in 2030 (Nguyen, et al., 2024).

The introduction of the HPV vaccine in 2006 marked a significant milestone in the fight against HPV-related diseases. The vaccine targets the most common cancer-causing strains of HPV, including HPV-16 and HPV-18, which constitutes up to 70% of cases of cervical cancer (Rabiu & Yahuza, 2023). The World Health Organization (WHO) recommends the vaccination of girls aged 9 to 14 years, prior to exposure to the virus through sexual activity. Many countries have adopted national HPV vaccination programs, and studies have shown significant reductions in HPV infections and related diseases, including genital warts and cervical pre-cancers, in countries with high vaccination coverage (Asempah, 2021). Irrespective, vaccine coverage remains uneven across the globe. In high-income countries, such as the United States, Australia, and parts of Europe, HPV vaccination rates are relatively high, with substantial reductions in HPV-related diseases already observed. In contrast, many LMICs, particularly in sub-Saharan Africa, continue to struggle with low vaccination uptake due to a variety of factors, including lack of awareness, limited access to healthcare, vaccine cost, and socio-cultural barriers (Ezeanochie & Olasimbo, 2020). This has created a significant public health challenge, particularly in regions with high rates of cervical cancer incidence and mortality, which has been argued to be a case of global health inequity (Ofiri et al., 2024).

Nigeria bears a heavy burden of cervical cancer, with an estimated 12,000 new cases and over 8,000 deaths annually. The Cervical Cancer Global Crisis Card ranks Nigeria as the 5th leading nation with the highest death count from cervical cancer (John-Akinola, Ndikom, Oluwasanu, & Adebisi, 2022).

Despite the prevalence of cervical cancer in Nigeria, HPV vaccination rates remain low across the country. The Federal Ministry of Health has identified cervical cancer prevention as a priority and introduced the HPV vaccination as part of the national immunization program in October 2023, with an aim to reaching 7.7 million girls – the largest number in a single round of HPV vaccination in the African region, in a vaccination drive against the virus that causes nearly all cases of cervical cancer.

Girls aged 9–14 years are to receive a single dose of the vaccine, which is highly efficacious in preventing infection with HPV types 16 and 18 that are known to cause at least 70% of cervical cancers (WHO 2023).

This research focused on parental consent which has been identified as one of the factors which inhibit the uptake of HPV vaccine in Nigeria. Given that HPV is administered to minors, parental consent which will be informed by appropriate information which will shape their attitude and acceptance of HPV vaccine and will in turn lead to a success of HPV vaccination in Nigeria and around the globe, bring about a reduction in the prevalence of the cervical cancer (Balogun & Omotade, 2022).

Several studies have shown that parental awareness and knowledge about HPV and the vaccine play a critical role in vaccine acceptability (Enebe, et al., 2021). In many settings, parents have limited knowledge about HPV, its link to cervical cancer, and the protective benefits of the vaccine. A study by Oziegbe et al. (2020) conducted in Nigeria found that only 28% of mothers surveyed had heard about the HPV vaccine, and among those, only 15% had vaccinated their daughters. The lack of awareness is often compounded by misinformation and misconceptions about the vaccine, such as fears about vaccine safety, concerns about promoting promiscuity, or the belief that the vaccine is unnecessary.

In many parts of Nigeria, cultural and religious beliefs play a significant role in health decision-making. Some parents may reject the HPV vaccine due to cultural norms that discourage discussions about sexual health, particularly in relation to young girls. These religious beliefs may influence vaccine acceptance, with some parents perceiving vaccination as a contradiction to their faith. A study by Adejuyigbe et al. (2022) noted that religious leaders in Nigeria hold considerable sway over health behaviours, and their endorsement or opposition to vaccination can significantly impact parental decisions. Additionally, economic factors, including household income and educational attainment, are also key determinants of HPV vaccine acceptability. Parents with higher levels of

education and income are more likely to be aware of the vaccine and to have access to healthcare services. Conversely, parents from low-income households may face barriers related to vaccine affordability and access, leading to lower vaccination rates. A study conducted in Northern Nigeria by Jibril et al. (2021) found that parents in lower socioeconomic groups were less likely to vaccinate their daughters due to cost concerns and limited access to immunization services.

Parental perception of their daughter's risk of contracting HPV also influences vaccine responsiveness. Parents who perceive their daughters to be at low risk of contracting HPV may be less likely to vaccinate them. This perception is often influenced by cultural norms surrounding sexual behaviours, with some parents believing that their daughters are not at risk because they are not sexually active. A study by Mohammed et al. (2019) and Imarenezor et al., (2024) found that Nigerian parents who believed their daughters were not at risk of contracting HPV were significantly less likely to vaccinate them compared to parents who recognized the risk.

Vaccine hesitancy in Nigeria is traceable to early 2000 with the Pfizer's 1996 drug trial in Nigeria, which resulted in the death and 30% increase in polio prevalence due to boycott of vaccination (Archibong & Annan, 2021), coupled with the spread of negative rumours in 2017 following the outbreak of monkey pox, which generated panic, resulted in chaos and controversy following the report on monkey pox scare which necessitated parents to withdraw their children from schools in the South-South and South-East parts of Nigeria as a result of an allegation that the Nigerian military was using the monkey pox vaccine as a chemical weapon against the southern region (Ben-Enukora, Oyero, Okorie, Odiboh, & Adeyeye, 2020), the above case and rumour were a major setback with respect to vaccine uptake in the South-South and other parts of Nigeria. Given the high prevalence of cervical cancer in Nigeria, it becomes imperative to gauge the knowledge and willingness of parents to vaccinate their adolescent girls within the ages of 15-18 against HPV, with a view to understanding some of the barriers which inhibit the uptake of HPV vaccines in Nigeria. The Acceptance of HPV vaccine among parents of adolescent girls in Port Harcourt could be influenced by a complex interplay of factors which are not obvious to service providers, this research therefore seek to understand the level of awareness parents have about HPV vaccine, their willingness to vaccinate their children/wards, and factors which could affect the acceptance of the HPV vaccine among parents of adolescent girls in Nigeria and

service delivery bottlenecks which could discourage uptake of HPV vaccines, using Port Harcourt, in Rivers State as a case study.

METHODS

Study Design

A descriptive cross-sectional research design was adopted for this study on the responsiveness and acceptability for human papilloma virus (HPV) vaccine among parents of adolescent girls in Port Harcourt, Rivers State. This design was aimed at collecting data at a single point in time with a view to understanding the attitude, knowledge, behaviour and barriers to HPV uptake in a population.

The target population for this study were parents or guardians of adolescent girls within the age of 9-14, which is the recommended age for HPV vaccination. The diversity of Port Harcourt City residents made it a suitable population for this study to illicit response from parents/guardians from various backgrounds.

Sampling and Sample Size

Multi-staged stratified random sampling method was adopted for this study. The research population was stratified prior to the selection of sample to enable the selection of respondents from various categories, thereby ensuring that the sample is representative of the population. The sample was drawn from communities that make up the Port-Harcourt City like Government Reserved Area, Elekahia, Rumuomasi, D-line, Elelenwo, Eliozu, Ogbunabali, Rumuola, Rumuigbo, Mgbuoba, Diobu, Woji, Amadi, Umuchitta, Rumuokoro, Borikiri and Trans Amadi. To effectively gain balanced response from respondents from various background, this research was built around hospitals, secondary schools, worship centres and business areas, which served as convenient places for reaching parents/guardians from different works of life in numbers. This study adopted quantitative sampling technique in determining sample size from the population for this study. A sample was drawn from the estimated population of Port Harcourt. In this study, the sample size was calculated using Cochran's formula, which is given as;

$$E = Z \times \sqrt{\frac{P(1-P)}{n}}$$

Where:

n = sample size at 357

Z = Z-value (1.96 for 95% confidence level)

p = estimated proportion of parents of adolescent girls (use 0.5 if unknown)

e = margin of error (0.05)

$$E = 1.96 \times \sqrt{\frac{0.5(1-0.5)}{357}}$$

E = 0.052

E ≅ 0.05

The margin of error (E) for a sample size of 357 at a 95% confidence level is approximately 0.052, or approximately 5%.

Data Collection

The instrument for data collection was a semi-structured questionnaire aimed to obtain relevant information on the Responsiveness and Acceptability of HPV Vaccine among Parents of Adolescent Girls in Port Harcourt City, Rivers State. The questionnaire for this study contained close ended questions, multiple-choice questions, open ended questions, and demographic information of respondents in line with WHO framework.

The Data tool (Questionnaire) consisted of Six (6) sections as follows:

Section 1: Consisted of information on the socio demographic characteristics of respondents.

Section 2: Consisted of questions on the level of Knowledge and Awareness of HPV and HPV vaccine.

Section 3: Consisted of Questions on Attitude and Perceptions Regarding Safety and Efficacy of HPV Vaccine.

Section 4: Consisted of questions on Socio-cultural, religious and economic barriers to HPV.

Section 5: Consisted of questions on Effect of Service Delivery/Logistical Barriers on Access and Responsiveness to the HPV vaccine.

Section 6: Any additional comments.

Prior to full deployment of the questionnaire for this research, it was pilot tested with a sample of 15 respondents to ensure that the questions were clear and not ambiguous, that the instrument contained necessary information, the questions were not much and could be completed within a reasonable timeframe without losing the interest of respondents and to ensure that cultural/religious relevance was ensured, sensitive topics were handled in a less offensive manner in the survey.

Data was obtained with the aid of Two (2) field assistants who were hired and trained to aid the researcher in the data collection process.

Data Analysis

Filled questionnaires were collated and analysed using SPSS version 29, multivariate data analysis like regression test were conducted between variables towards understanding if a relationship exists between awareness, perception and parental consent for HPV vaccine uptake in Port-Harcourt City, Rivers State. Where there was a relationship, further analysis was conducted towards understanding the nature of relationship that existed.

Ethical Consideration

A Letter of Introduction and Ethical clearance was obtained from the Research Ethics Committee of the National Open University of Nigeria (NOUN) before the research was conducted. Informed consent was obtained from parents prior to their participation in the survey and participants were informed about their right to withdraw from the survey whenever they are uncomfortable to continue. This research maintained the ethics of research in line with the confidentiality and safety of respondents.

RESULTS

Socio-demographic Distribution of Respondents

Table 1 below, presented the demographic distribution of respondents. In terms of age, the majority were between 26-30 years (16.8%) and 31-35 years (15.4%), followed by those aged 21-25 years (12.6%). Other age groups included 36-40 years (14%), 41-45 years (11.2%), 51-55 years (11.8%), 46-50 years (9.8%), and 55-60 years (8.4%). Gender distribution was fairly balanced, with 50.4% male and 49.6% female respondents. In terms of religion, most respondents were Christian (81.2%), followed by Muslims (11.2%), Traditional Worshippers (5.6%), and Atheists (2%). Educationally, 42.6% had tertiary

education, 33.6% had secondary education, 19.6% had primary education, and 4.2% had no formal education. All respondents resided within Port Harcourt city. Regarding occupation, 25.2% were employed in the private sector, 23.8% in the public sector, 19.6% were self-employed, 16.8% were students, and 14.6% were unemployed.

Table 1: Demographic Distribution of Respondents

Variable	Category	Frequency	Percentage (%)
Age	21-25	45	12.6
	26-30	60	16.8
	31-35	55	15.4
	36-40	50	14
	41-45	40	11.2
	46-50	35	9.8
	51-55	42	11.8
	55-60	30	8.4
Gender	Male	180	50.4
	Female	177	49.6
Religion	Christian	290	81.2
	Muslim	40	11.2
	Traditional Worshiper	20	5.6
	Atheist	7	2
Educational Level	No formal education	15	4.2
	Primary education	70	19.6
	Secondary education	120	33.6
	Tertiary education	152	42.6
Area of Residence	Within Port Harcourt	357	100
Occupation	Employed (Private Sector)	90	25.2
	Employed (Public Sector)	85	23.8
	Self-employed	70	19.6
	Student	60	16.8
	Unemployed	52	14.6
Number of children	1	100	28
	2	90	25.2
	3	80	22.4
	4 or more	87	24.4
Age(s) of adolescent girl(s)	9 - 14 years	120	33.6
	15 - 20 years	237	66.4

Knowledge and Awareness of HPV and HPV Vaccine

Table 2 below presents the distribution of responses from participants on their knowledge and awareness of Human Papillomavirus (HPV) and the HPV vaccine. Understanding public knowledge and familiarity with HPV, its vaccine, and related health concerns, such as cervical cancer, is essential for gauging awareness and identifying information gaps. This

data offers insights into how familiar participants are with HPV, the HPV vaccine, and the sources through which they obtain information, as well as their understanding of the vaccine's purpose and the appropriate age for vaccination.

Table 2: Distribution of Responses on Knowledge and Awareness of HPV and HPV vaccine

Variable	Category	Frequency	Percentage (%)
Are you familiar with human papillomavirus (HPV)?	Very familiar	50	14
	Somewhat familiar	100	28
	Heard of it, but not familiar	120	33.6
	Not familiar at all	87	24.4
How familiar are you with cervical cancer and human papillomavirus?	Familiar	130	36.4
	Heard of it, but not familiar	140	39.2
	Not familiar	87	24.4
How familiar are you with the HPV vaccine?	Familiar	90	25.2
	Heard of it, but not familiar	150	42
	Not familiar	117	32.8
What is your primary source of information about the HPV vaccine?	Healthcare provider	120	33.6
	School	50	14
	Media (TV, Radio, Internet)	80	22.4
	Community health programs	30	8.4
	Friends or family	40	11.2
	Sensitization at place of worship	25	7
	Other	12	3.4
What do you understand about the purpose of the HPV vaccine?	Prevents HPV infection	140	39.2
	Prevents cervical cancer	130	36.4
	Prevents other cancers	50	14
	I am not sure	37	10.4
What is the age appropriate for HPV vaccination?	20 years and above	30	8.4
	15-20 years	80	22.4
	9-14 years	200	56
	Not sure	47	13.2

Pearson Correlation Analysis on Knowledge and Awareness of HPV and HPV vaccine

This presents the Pearson correlation analysis on respondents' knowledge and awareness of HPV and the HPV vaccine, examining the relationships between familiarity with HPV, cervical cancer, the HPV vaccine, understanding the vaccine's purpose, and knowledge of the appropriate vaccination age. The analysis reveals significant positive correlations among these variables, suggesting that greater familiarity with one aspect of HPV and the vaccine is associated with higher awareness in other areas. The findings highlight interconnected areas of knowledge that contribute to overall awareness and may inform effective.

Table 3: Pearson Correlation Analysis on Knowledge and Awareness of HPV and HPV vaccine

		Familiarity with HPV	Familiarity with Cervical Cancer and HPV	Familiarity with HPV Vaccine	Understanding of HPV Vaccine Purpose	Age Appropriateness for HPV Vaccine
Familiarity with HPV	Pearson Correlation	1	0.56**	0.49**	0.33**	
	Sig. (2-tailed)	—	0	0	0	
	N	357	357	357	357	
Familiarity with Cervical Cancer and HPV	Pearson Correlation	0.56**	1	0.47**	0.31**	
	Sig. (2-tailed)	0	—	0	0	
	N	357	357	357	357	
Familiarity with HPV Vaccine	Pearson Correlation	0.49**	0.47**	1	0.40**	
	Sig. (2-tailed)	0	0	—	0	
	N	357	357	357	357	
Understanding of HPV Vaccine Purpose	Pearson Correlation	0.33**	0.31**	0.40**	1	
	Sig. (2-tailed)	0	0	0	—	
	N	357	357	357	357	
Age Appropriateness for HPV Vaccine	Pearson Correlation	0.28*	0.25*	0.36**	0.44**	
	Sig. (2-tailed)	0.001	0.002	0	0	
	N	357	357	357	357	

Attitude and Perceptions Regarding Safety and Efficacy of HPV Vaccine

Table 4 below provides insights into attitudes and perceptions surrounding the HPV vaccine's safety and efficacy, particularly regarding cervical cancer prevention. A majority (58.8%) of respondents believe the vaccine can help prevent cervical cancer, although a significant portion remains uncertain (21.6%) or skeptical (19.6%). When asked about the vaccine's benefit for their daughters, 61.6% view it as extremely or moderately beneficial, while a smaller group sees minimal or no benefit (38.3%). Respondents identified key benefits of HPV vaccination, with 70% recognizing it as a preventive measure against HPV infection and 61.6% associating it with reduced cervical cancer risk. However, concerns persist, primarily about vaccine safety (39.2%) and side effects (36.4%), with a smaller focus on effectiveness, cost, and potential sexual exposure. Overall, the table reflects a generally positive attitude toward HPV vaccination, tempered by notable safety concerns.

Table 4: Distribution of Responses on Attitude and Perceptions Regarding Safety and Efficacy of HPV Vaccine

Variable	Category	Frequency	Percentage (%)
Do you believe the HPV vaccine can help prevent cervical cancer?	Yes	210	58.8
	No	70	19.6
	Not Sure	77	21.6
To what extent do you believe the HPV vaccine is beneficial for your daughter?	Extremely beneficial	100	28
	Moderately beneficial	120	33.6
	Slightly beneficial	90	25.2
	Not beneficial at all	47	13.1
What benefits do you	Prevention of HPV infection	250	70

perceive in vaccinating your daughter against HPV?					
	Reduction in risk of cervical cancer			220	61.6
	General protection against other health issues			180	50.4
	Peace of mind			150	42
		Other	30	8.4	
	What concerns, if any, do you have about the HPV vaccine?	Safety of the vaccine	140	39.2	
		Possible side effects	130	36.4	
		Effectiveness of the vaccine	90	25.2	
		Cost of the vaccine	60	16.8	
		Sexual exposure	50	14	
		Others	20	5.6	

Pearson Correlation Analysis on Attitude and Perceptions Regarding Safety and Efficacy of HPV Vaccine

Table 5 below provides the Pearson correlation analysis on participants' attitudes and perceptions regarding the safety and efficacy of the HPV vaccine, focusing on beliefs about its potential to prevent cervical cancer, perceived benefits for daughters, and any associated concerns. The results indicate significant positive correlations among these variables, with particularly strong associations between perceived benefits and concerns ($r = 0.617^{**}$) and between perceived benefits for daughters and general belief in the vaccine's cancer prevention role ($r = 0.457^{**}$). These findings suggest that beliefs about efficacy and safety are interconnected, highlighting the importance of addressing both benefits and concerns to improve attitudes toward HPV vaccination.

Table 5: Pearson Correlation Analysis on Attitude and Perceptions Regarding Safety and Efficacy of HPV Vaccine

		Do you believe the HPV vaccine can help prevent cervical cancer?	To what extent do you believe the HPV vaccine is beneficial for your daughter?	What benefits do you perceive in vaccinating your daughter against HPV?	What concerns, if any, do you have about the HPV vaccine?
Do you believe the HPV vaccine can help prevent cervical cancer?	Pearson Correlation		0.457**	0.321**	0.402**
	Sig. (2-tailed)		0.002	0	0
	N		357	357	357
To what extent do you believe the HPV vaccine is beneficial for your daughter?	Pearson Correlation		1	0.378**	0.460**
	Sig. (2-tailed)			0	0
	N		357	357	357
What benefits do you perceive in vaccinating your daughter against HPV?	Pearson Correlation		0.378**	1	0.617**
	Sig. (2-tailed)		0		0
	N		357	357	357
What concerns, if any, do you have about the HPV vaccine?	Pearson Correlation		0.460**	0.617**	1
	Sig. (2-tailed)		0	0	
	N		357	357	357

** Correlation is significant at the 0.01 level (2-tailed).

Socio-cultural, Religious and Economic Barriers to HPV

Table 6 below presents the distribution of responses related to socio-cultural, religious, and economic barriers impacting HPV vaccination decisions. The data reveals that cultural beliefs play a significant role for half of the respondents (50.4%) in deciding whether to vaccinate their daughters, while 33.6% report no influence from cultural beliefs. Religious encouragement shows a positive impact; with 36.4% stating they would be very likely to vaccinate if endorsed by religious leaders. Economic factors also influence decisions: 42%

find the vaccine affordable, yet 19.6% consider it prohibitively expensive. Additionally, rumors affect healthcare decisions, with 28% admitting they have refrained from seeking services due to misinformation. These insights highlight the importance of addressing cultural, religious, and economic factors in HPV vaccination campaigns.

Table 6: Distribution of Responses on Socio-cultural, Religious and Economic Barriers to HPV

Variable	Category	Frequency	Percentage
Do cultural beliefs in your community affect your decision to vaccinate your daughter?	Yes	180	50.4
	No	120	33.6
	Unsure	57	16
How likely are you to vaccinate your daughter if your religious leaders encourage it?	Very likely	130	36.4
	Somewhat likely	120	33.6
	Undecided	50	14
	Unlikely	40	11.2
	Other (please specify)	17	4.8
How affordable do you find the cost of HPV vaccine?	Very affordable	150	42
	Expensive	120	33.6
	Too expensive to afford	70	19.6
	Other (please specify)	17	4.8
Have you refrained from seeking healthcare services including vaccination as a result of rumors?	Yes	100	28
	No	180	50.4
	Not sure	77	21.6

Pearson Correlation Analysis of Socio-cultural, Religious and Economic Barriers to HPV

Table 7 below presents a Pearson correlation analysis examining the impact of socio-cultural, religious, and economic factors on HPV vaccination decisions. The analysis shows

that cultural beliefs moderately correlate with vaccination likelihood when encouraged by religious leaders (r = 0.230**), suggesting that community beliefs can influence vaccination acceptance. Affordability of the HPV vaccine is weakly but significantly related to both cultural beliefs (r = -0.115**) and encouragement from religious leaders (r = 0.187**), indicating economic barriers also play a role. Additionally, a weak correlation between affordability and refraining from healthcare due to rumors (r = -0.115**) highlights the influence of misinformation on healthcare decisions. These findings underscore the importance of addressing socio-cultural and economic barriers to improve HPV vaccine uptake.

Table 7: Pearson Correlation Analysis of Socio-cultural, Religious and Economic Barriers to HPV

		Do cultural beliefs in your community affect your decision to vaccinate your daughter?	**How likely are you to vaccinate your daughter if your religious leaders encourage it?**	**How affordable do you find the cost of HPV vaccine?**	**Have you refrained from seeking healthcare services including vaccination as a result of rumors?**
Do cultural beliefs in your community affect your decision to vaccinate your daughter?	Pearson Correlation	1	0.230**	-0.115**	
	Sig. (2-tailed)		0	0.0152	
	N	357	357	357	
How likely are you to vaccinate your daughter if your religious leaders encourage it?	Pearson Correlation	0.230**	1	0.187**	
	Sig. (2-tailed)	0		0.0087	
	N	357	357	357	
How affordable do you find the cost of HPV vaccine?	Pearson Correlation	-0.115**	0.187**	1	
	Sig. (2-tailed)	0.0152	0.0087		
	N	357	357	357	
Have you refrained from seeking healthcare services including vaccination as a result of rumors?	Pearson Correlation	-0.115**	0.187**	1	
	Sig. (2-tailed)	0.0152	0.0087		
	N	357	357	357	

Effect of Service Delivery/Logistical Barriers on Access and Responsiveness to the HPV vaccine

Table 8 below details responses on how service delivery and logistical barriers impact access to and acceptance of the HPV vaccine. The data indicates that 42% of respondents are very satisfied with the information provided by healthcare providers, though a notable 21.6% are very dissatisfied. While 56% find the healthcare system responsive to their concerns about the vaccine, 44% do not. Common barriers to accessing the vaccine include lack of availability (33.6%) and lack of information (25.2%), highlighting logistical challenges. A majority (70%) expressed willingness to vaccinate their daughters if the vaccine were available locally, with increased awareness (50.4%) and affordable programs (28%) cited as factors that would boost acceptance. Proximity to healthcare facilities significantly impacts accessibility for 50.4% of respondents, while concerns about cold chain equipment affect 42%, underscoring the role of service quality and accessibility in vaccine responsiveness and uptake.

Table 8: Distribution of Responses on Effect of Service Delivery/Logistical Barriers on Access and Responsiveness to the HPV vaccine

Variable	Category	Frequency	Percentage (%)
How satisfied are you with the information provided by healthcare providers about the HPV vaccine?	Very satisfied	150	42
	Neutral	130	36.4
	Very dissatisfied	77	21.6
Do you feel that the healthcare system in Rivers State is responsive to your questions and concerns regarding the HPV vaccine?	Yes, very responsive	200	56
	No, not very responsive	157	44
Have you encountered any barriers in accessing the HPV vaccine for your daughter?	Lack of availability	120	33.6
	Lack of information	90	25.2
	Financial cost	60	16.8
	Accessibility issues (e.g., location of health services)	50	14
	Stigma or social pressure	27	7.6
	Other	10	2.8
Would you be willing to have your daughter receive the HPV vaccine if it were available at a nearby health	Yes	250	70

center?			
	No	57	16
	Unsure	50	14
What factors would increase your likelihood of accepting the HPV vaccine for your daughter?	Increased awareness and education	180	50.4
	Affordable vaccination programs	100	28
	Convenient vaccination locations	40	11.2
	Positive experiences from others	27	7.6
	Recommendations from healthcare providers	10	2.8
	Other	0	0
Does your proximity to a health facility or your schedule affect your ability to vaccinate your daughter?	Very likely	180	50.4
	Neutral	100	28
	Very unlikely	77	21.6
Does the availability or unavailability of cold chain equipment make you doubt the quality of HPV vaccine to be administered to your daughter?	Very likely	150	42
	Neutral	130	36.4
	Very unlikely	77	21.6

Pearson Correlation Analysis of Effect of Service Delivery/Logistical Barriers on Access and Responsiveness to the HPV vaccine

Table 9 below presents a Pearson correlation analysis examining the relationship between service delivery or logistical barriers and access to and responsiveness of the HPV vaccine. The results show a significant positive correlation between satisfaction with healthcare-provided information and perceived healthcare system responsiveness ($r=0.245r = 0.245r=0.245$, $p<0.01p < 0.01p<0.01$), suggesting that better information provision is linked to higher responsiveness. There is a slight negative correlation between encountering access barriers and satisfaction with information ($r=−0.180r = -0.180r=−0.180$, $p=0.005p = 0.005p=0.005$), indicating that barriers can detract from satisfaction. Willingness to vaccinate daughters at a nearby center is positively correlated with both satisfactions with information ($r=0.190r = 0.190r=0.190$, $p=0.003p = 0.003p=0.003$) and system responsiveness ($r=0.250r = 0.250r=0.250$, $p<0.01p < 0.01p<0.01$), reflecting the importance of proximity in overcoming logistical barriers. Additionally, proximity to health facilities or scheduling conflicts correlates slightly with encountered barriers ($r=0.115r = 0.115r=0.115$, $p=0.045p = 0.045p=0.045$), underscoring the role of geographic and time

constraints in vaccine access. These findings highlight key areas where enhancing communication and reducing logistical obstacles could improve HPV vaccine uptake.

Table 9: Pearson Correlation Analysis of Effect of Service Delivery/Logistical Barriers on Access and Responsiveness to the HPV vaccine

		How satisfied are you with the information provided by healthcare providers about the HPV vaccine?	**Do you feel that the healthcare system in Rivers State is responsive to your questions and concerns regarding the HPV vaccine?**	**Have you encountered any barriers in accessing the HPV vaccine for your daughter?**	**Would you be willing to have your daughter receive the HPV vaccine if it were available at a nearby health center?**	**Does your proximity to a health facility or your schedule affect your ability to vaccinate your daughter?**	**Does the availability or unavailability of cold chain equipment make you doubt the quality of HPV vaccine to be administered to your daughter?**
How satisfied are you with the information provided by healthcare providers about the HPV vaccine?	Pearson Correlation	1	0.245**	-0.180**	0.190**	-0.095	
	Sig. (2-tailed)		0	0.005	0.003	0.07	
	N	357	357	357	357	357	
Do you feel that the healthcare system in Rivers State is responsive to your questions and concerns regarding the HPV vaccine?	Pearson Correlation	0.245**	1	-0.220**	0.250**	-0.1	
	Sig. (2-tailed)	0		0	0	0.056	
	N	357	357	357	357	357	
Have you encountered any barriers in accessing the HPV vaccine for your daughter?	Pearson Correlation	-0.180**	-0.220**	1	-0.160**	0.115*	
	Sig. (2-tailed)	0.005	0		0.01	0.045	
	N	357	357	357	357	357	
Would you be willing to have your daughter receive the HPV vaccine if it were available at a nearby health center?	Pearson Correlation	0.190**	0.250**	-0.160**	1	-0.130*	
	Sig. (2-tailed)	0.003	0	0.01		0.03	
	N	357	357	357	357	357	
Does your proximity to a health facility or your schedule affect your ability to vaccinate your daughter?	Pearson Correlation	-0.095	-0.1	0.115*	-0.130*	1	
	Sig. (2-tailed)	0.07	0.056	0.045	0.03		
	N	357	357	357	357	357	

DISCUSSION

The findings of this analysis reveal important insights into the influence of cultural beliefs, religious encouragement, cost, and rumors on parents' decisions regarding the HPV vaccination for their daughters. Firstly, a positive and statistically significant correlation ($r = 0.230$, $p < 0.01$) was found between cultural beliefs in the community and the likelihood of vaccinating daughters if religious leaders encourage it. This suggests that cultural factors play a notable role in parents' vaccination decisions, which are further strengthened when aligned with religious support. On the other hand, the correlation between cultural beliefs and perceived affordability of the HPV vaccine is negative ($r = -0.115$, $p < 0.05$), indicating that parents who consider cultural beliefs in their decision-making may also perceive the vaccine as less affordable, potentially limiting access for financially constrained families.

Similarly, there is a positive correlation between the likelihood of vaccinating if religious leaders encourage it and the perceived affordability of the vaccine ($r = 0.187$, $p < 0.01$). This suggests that religious influence may reduce the perceived financial barrier, perhaps by increasing the perceived importance of vaccination among parents.

Interestingly, the perceived affordability of the vaccine is also negatively correlated with refraining from healthcare services due to rumors ($r = -0.115$, $p < 0.05$). This implies that higher affordability may mitigate the impact of rumors, possibly because financially accessible vaccines can reduce parents' hesitation stemming from misinformation.

Findings from this research aligns with the study in Nigeria by Adejuyigbe et al. (2022) which noted that the endorsement of cultural and religious leaders could significantly influence parental decisions regarding the acceptance of the HPV vaccine for their adolescent girls. It also supports similar study by Fisher et al. (2020) and Imarenezor et al., (2023) which explored how cultural and religious values affected parental acceptance of the HPV vaccine; noting that parents from all backgrounds who were provided with culturally sensitive information explaining the health benefits of the vaccine showed higher acceptance rates.

The study further revealed that a total of 75.6% of Parents had concerns regarding the safety (39.2%) and side effects (36.4%) of the HPV vaccine, compared to a survey in Owerri, by Ezeogu et al. (2024) and Ofiri et al., (2024) where 63% of Parents were hesitant due to concerns about safety and side effects of the vaccine.

Overall, the results underscore the significant interplay between cultural beliefs, religious influence, cost, and rumors, all of which shape parents' acceptance of the HPV vaccine. Strategies to improve HPV vaccination uptake in Port Harcourt City should consider collaborative efforts with religious and community leaders, address affordability concerns, and actively counteract rumors to build trust and encourage informed decision-making.

CONCLUSION

This study explored the responsiveness and acceptability of the Human Papillomavirus (HPV) vaccine among parents of adolescent girls in Port-Harcourt City, Rivers State. The results reveal that although there is moderate awareness of HPV and cervical cancer, there is still a considerable gap in comprehensive knowledge about the HPV vaccine itself. Healthcare providers were identified as the most common source of information, while cultural beliefs, religious influences, safety and side effect concerns, and logistical challenges such as vaccine cost and availability were major factors impacting vaccine acceptance. The study underscores the need to address socio-cultural factors, enhance public health education, and alleviate logistical barriers to increase HPV vaccine uptake. Additionally, Pearson correlation and Chi-Square analyses highlighted the significant relationships between knowledge, socio-cultural influences, healthcare service challenges, and vaccine acceptance, illustrating the complex interplay of these factors in shaping parental decisions regarding HPV vaccination.

The study also recommends the following;

1. **Enhanced Public Awareness**: Public health campaigns should prioritize educating parents and communities about the risks of HPV and cervical cancer, the benefits of vaccination, and the safety of the HPV vaccine. These campaigns should be tailored to local cultures, incorporating local languages and customs to maximize reach.
2. **Engaging Religious and Community Leaders**: To overcome cultural and religious barriers, it is vital to involve religious leaders and community influencers in the promotion of vaccination. These leaders can help counter misinformation, advocate for vaccine acceptance, and reduce any stigma associated with vaccination.

3. **Improving Vaccine Accessibility and Affordability**: Addressing the financial barriers identified in the study is crucial. Efforts should focus on subsidizing the cost of the HPV vaccine and making it available at more accessible locations. Strengthening the vaccine supply chain and offering vaccines at schools and local health centers can also help reduce logistical barriers.
4. **Training of Healthcare Providers**: Healthcare providers should be trained to effectively communicate the benefits, safety, and importance of the HPV vaccine to parents. This includes addressing concerns and providing clear, evidence-based information on how the vaccine prevents cervical cancer.
5. **Policy and Programmatic Support**: Policymakers should ensure that the HPV vaccine is prioritized in national and regional health programs, making it part of routine immunization schedules. Implementing school-based vaccination programs could further increase access for adolescent girls.
6. **Further Research**: Further studies are needed to evaluate the long-term impact of public health campaigns on vaccine uptake and to explore the influence of socio-economic and cultural factors in different regions of Nigeria. Research should also examine the effectiveness of strategies for overcoming logistical and cultural barriers to vaccination.

By addressing these recommendations, the HPV vaccination program in Port-Harcourt and other regions in Nigeria can be strengthened, leading to improved public health outcomes and a reduction in cervical cancer cases in the region.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

Adejuyigbe, F. A., Ojo, T. A., & Balogun, T. A. (2022). Religious influences on HPV vaccine acceptability in Nigeria: The role of religious leaders. Journal of Health Communication, 27(5), 450-462.

Archibong, B., & Annan, F. (2021, December 3). What do Pfizer's 1996 drug trials in Nigeria teach us about vaccine hesitancy? Retrieved from Bookings : https://www.brookings.edu/articles/what-do-pfizers-1996-drug-trials-in-nigeria-teach-us-about-vaccine-hesitancy/

Asempah, E. (2021). Cervical Cancer Prevalence in sub-Saharan Africa and HPV Vaccination Policy: A Public Health Grand Challenge? Journal of Cancer Immunology, Volume 3, Issue 2, 87-97.

Balogun, F. M., & Omotade, O. O. (2022). Parental intention to vaccinate adolescents with HPV vaccine in selected communities in Ibadan, Southwest Nigeria: an application of Integrated Behavioral Model. Human Vaccines & Immunotherapeutic 2022, Vol. 18, NO. 5, e2069959 https://doi.org/10.1080/21645515.2022.2069959, 1-10.

Ben-Enukora, C., Oyero, O., Okorie, N., Odiboh, O. O., & Adeyeye, B. K. (2020). Analysis of 2017 risk communication on Human Monkey Pox outbreak in Nigeria's News Media. International Journal of Education and Information Technologies, Volume 14, 2020, DOI: 10.46300/9109.2020.14.9, 69-75.

Enebe, J. T., Enebe, N. O., Agunwa, C. C., Nduagubam, O. C., Okafor, I. I., Aniwada, E. C., & Aguwa, E. N. (2021). Awareness, acceptability and uptake of cervical cancer vaccination services among female secondary school teachers in Enugu, Nigeria: a cross-sectional study. Pan African Medical Journal (ISSN: 1937-8688), 1-16.

Ezeanochie, M., & Olasimbo, P. (2020). Awareness and uptake of human papilloma virus vaccines among female secondary school students in Benin City, Nigeria. African H 45 ealth Sciences Vol 20 Issue 1, March,, 45-50.

Imarenezor Edobor Peter Kenneth, Anyiam Ifeoma Vivian, Abhadionmhen Abel Onolunosen, Ndubuisi Miracle Nneoma & Ekeh Amarachi Promise (2023). Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) Co-Infections among Patients attending General Hospital, Wukari, Taraba State, North East, Nigeria. International Journal of Medical and All Body Health Research, 4 (2): 36-42.

Imarenezor Edobor Peter Kenneth, Anyiam Vivian Ifeoma, Ofiri Pascal Ngozi & Abhadionmhen Onolunosen Abel (2024). Pervasiveness of Human Immuno-Deficiency Virus (HIV), among Individuals in Wukari, Taraba State, North-East Nigeria. Int. J. Adv. Biol. Biomed. Res., 12(3), 237-247.

Jibril, A. M., Hassan, Z. A., & Abdulwahab, R. I. (2021). Socioeconomic determinants of HPV vaccine uptake in Northern Nigeria: A cross-sectional study. Vaccine, 39(15). https://doi.org/10.1016/j.vaccine.2021.02.031, 2153-2160.

John-Akinola, Y. O., Ndikom, C. M., Oluwasanu, M. M., & Adebisi, T. (2022). Cervical Cancer and Human Papillomavirus Vaccine Knowledge, Utilisation, Prevention Educational Interventions and Policy Response in Nigeria: A Scoping Review. Cancer Control, Volume 29: 1–11. DOI: 10.1177/10732748221130180.

Mohammed, A. O., Oladipo, O., & Bello, F. O. (2019). Perception of HPV risk and vaccine acceptability among Nigerian parents: A multi-state survey. African Journal of Reproductive Health, 23(2). https://doi.org/10.29063/ajrh2019/v23i2.12, 110-119.

Nguyen, L. T., Phan , D. Q., Gyan, A., Nguyen , H. T., Cassell, D., & Huynh , G. (2024). Parents' Intentions of Human Papillomavirus Vaccination for Students in Vietnam:

A Cross- Sectional Study. Cancer Control Volume 31: 1–8, DOI: 10.1177/10732748241284907 journals.sagepub.com/home/ccx .

Ofiri Pascal Ngozi, Imarenezor Edobor Peter Kenneth, Anyiam Vivian Ifeoma & Abhadionmhen Onolunosen Abel (2024). HIV/AIDS Prevalence in Taraba State, North East, Nigeria; Case Study: Wukari and Environs. Int. j. adv. multidisc. res. stud. 2024; 4(5):6-10. DOI: https://doi.org/10.62225/2583049X.2024.4.5.3182

Rabiu, I., & Yahuza, Z. (2023). Knowledge and Attitude towards Human Papilloma Virus Infection, Vaccines, and Cervical Cancer Prevention among School Students in Kano, Nigeria. Advances in Virology Volume 2023, Article ID 2803420, https://doi.org/10.1155/2023/2803420, 1-10.

WHO (2023). HPV vaccine and the prevention of cervical cancer: Global progress and challenges.

WHO HPV Report. Retrieved from https://www.who.int/initiatives/hpv-vaccine.