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Barriers and Facilitators to the Acceptance and Utilization of the Human Papillomavirus Vaccine in Anambra State: A Qualitative Analysis

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Abstract

Human Papillomavirus (HPV) vaccination is recognized as a highly effective strategy and preventive measure against cervical cancer globally. Despite the introduction of the HPV vaccine (Gardasil-9) into Nigeria Expanded Program on Immunization Schedule in 2023 and health facilities providing routine immunization services across Anambra state in May 2024, uptake remains suboptimal. This study employed a qualitative descriptive survey design to explore the barriers and facilitators to the acceptance and utilization of the HPV vaccine in six Local Government Areas across the three senatorial zones of Anambra State. Data were collected from 360 participants, including parents, adolescents, community members and healthcare workers, using focus group discussions and key informant interviews, and analyzed thematically. Findings revealed that healthcare workers demonstrated high knowledge and strong advocacy for vaccination, while parents and adolescents showed moderate awareness and conditional acceptance influenced by safety concerns, cultural and religious beliefs. Misconceptions on the safety of the vaccine and trust in misinformation including rumors were highlighted as a major barrier to vaccine utilization among the community members. Systemic factors such as inconsistent vaccine supply, cold chain limitations, and uneven distribution further constrained vaccine utilization. Facilitators identified included trust in healthcare providers, prior exposure to health education campaigns, and per-

ceived preventive benefits of vaccination. The study concludes that improving HPV vaccine uptake in Anambra State requires targeted educational interventions, culturally sensitive communication, strengthened vaccine supply chains, and active engagement of healthcare workers as trusted community advocates. These findings provide evidence-based guidance for policy and programmatic strategies to enhance HPV vaccination coverage and reduce HPV-related disease burden in the region.

Keywords

Human Papillomavirus Vaccine, Vaccination, HPV, Vaccines, Cervical Cancer

1. Introduction

In contemporary virology, a virus is a microscopic, obligate intracellular parasite consisting of a nucleic acid genome either DNA or RNA encapsulated within a virus-coded protein coat, with some viruses also possessing a lipid envelope derived from the host cell membrane; such particles are biologically inert outside of host cells and depend entirely on host cellular machinery for replication and propagation. Viruses occupy a unique position at the boundary between living and non-living entities because they lack independent metabolic systems and cellular structures necessary for growth and replication, relying entirely on host cells for propagation [1]. Once inside a host, viral genomes commandeer the host's biosynthetic processes to amplify viral components and assemble new virions, a process fundamental to the pathogenesis of viral diseases affecting humans, animals, plants, and microorganisms. One of the viruses common to human is Human Papilloma Virus (HPV).

Human Papillomavirus (HPV) is one of the most prevalent sexually transmitted infections (STIs) worldwide, with significant public health implications. The virus is linked to a spectrum of conditions, ranging from benign warts to malignancies, most notably cervical cancer [2]. According to the World Health Organization, HPV causes hundreds of thousands of cancer cases globally each year, making it a major contributor to the global cancer burden [2]. More than 200 HPV types have been identified, with over 40 affecting the anogenital region [3]. High-risk HPV types, particularly HPV 16 and 18, are responsible for approximately 70% of cervical cancer cases [4].

Epidemiological data indicate that over 90% of sexually active men and 80% of sexually active women will acquire an HPV infection at some point in their lifetime [5]. In most cases, the immune system clears the infection naturally. However, persistent HPV infections, particularly those involving high-risk strains, are the leading cause of cervical cancer and are also associated with cancers of the vulva, vagina, mouth/throat, penis, and anus [6]. In 2019 alone, HPV-related cancers were estimated at 620,000 cases in women and 70,000 cases in men worldwide

[6]. The prevalence of HPV is strongly influenced by age, sexual behavior patterns, and geographic differences, with the highest incidence occurring within the first few years after the onset of sexual activity [7]. To mitigate the burden of HPV-related diseases, public health interventions such as educational campaigns, safe sex practices, and early vaccination programs have been prioritized.

The development of HPV vaccines—Gardasil-9, Cervarix, and Gardasil—has been a major advancement in preventing HPV-related infections and their sequelae. These vaccines, targeting high-risk HPV strains, have demonstrated significant efficacy in reducing the incidence of HPV-related diseases [8]. Anambra State has been on the forefront on the fight against Cervical cancer with the wife of the Governor, Dr. Nonye Soludo, leading by conducting screening of over 18,000 women of child-bearing age in 2023 having a positivity rate of 2.8%. The program targeted women of childbearing age through; women development platforms, religious organizations, community engagements, women august meeting programs and more.

In May 2024, Anambra State, through the National Primary Health Care Development Agency (NPHCDA) in partnership with WHO and UNICEF, introduced the HPV vaccine (Gardasil-9) into its Expanded Program on Immunization (EPI). This initiative aimed to achieve nationwide routinization, similar to the successful routinization of the COVID-19 and Rotavirus vaccines. The COVID-19 vaccine rollout in Anambra recorded high uptake, with over 2 million individuals vaccinated. The success of this program was largely attributed to strategic interventions, including multiple rounds of supplementary immunization activities (SIAs) before routinization, robust funding, aggressive awareness and mobilization campaigns (ACSM), and visible health impacts that reinforced public trust. Similarly, the Rotavirus vaccine has been well-received, with over 300,000 children immunized annually with at least one dose. The high acceptance of the Rotavirus vaccine is primarily linked to the significant disease burden in children and the financial relief it offers caregivers, who previously relied on costly out-of-pocket purchases for immunization.

Human Papillomavirus (HPV) vaccination is recognized globally as a highly effective preventive measure against cervical cancer and other HPV-related diseases [9]. Ideally, the population in Anambra State should experience high levels of awareness, acceptance, and utilization of the HPV vaccine, supported by adequate healthcare infrastructure, public health education, and community engagement. In such a scenario, adolescents and young adults would have timely access to vaccination, misconceptions about the vaccine would be minimal, and vaccination coverage would significantly reduce the prevalence of HPV infections and the incidence of cervical cancer in the state.

Contrary to this ideal situation, the current reality in Anambra State reflects multiple barriers that limit the acceptance and utilization of the HPV vaccine. These barriers include poor knowledge and awareness about the vaccine, cultural and religious misconceptions, fear of side effects, limited accessibility of vaccination services, and inadequate health promotion efforts [10]. As a result, HPV in-

fections continue to spread, and the associated burden of cervical cancer remains high, posing significant public health challenges.

Given this gap between the ideal and current situation, there is a critical need to identify both the barriers and facilitators that influence the acceptance and utilization of the HPV vaccine in Anambra State. Understanding these factors will provide evidence-based insights for designing targeted interventions, improving vaccine uptake, and ultimately reducing the incidence of HPV-related diseases in the region. This study will therefore contribute to enhancing public health strategies and guiding policy implementation for effective HPV vaccination programs in Anambra State.

2. Objective of the Study

The main objective of this study is to identify the barriers and facilitators to the acceptance and utilization of the Human Papillomavirus Vaccine in Anambra state using a qualitative analysis. The specific objectives of this study are:

Assess awareness and knowledge of HPV and HPV vaccine among parents, adolescents and health workers in Anambra state.

Identify the barriers influencing acceptance of the Human Papillomavirus Vaccine in Anambra state.

Identify the facilitators to the utilization of the Human Papillomavirus Vaccine in Anambra state.

3. Inclusion Criteria

This study only included respondents in the following category.

Adolescents, Only girls who are 9 - 14 years;

Parents, Only parents of girls who are 9 – 14 years;

Community members, Only from communities where HPV vaccine introduction campaign was conducted in;

Health care workers, Only Health care workers that provide routine immunization services.

4. Methodology

4.1. Study Design

The study adopted a descriptive survey research design, which involves collecting, organizing, analyzing, and interpreting data to describe the characteristics, opinions, behaviors, or attitudes of a population or phenomenon without manipulating variables. The design was chosen because it focuses on exploring participants' views using open-ended instruments such as interviews or narrative responses. In this sense, the design remains descriptive by portraying phenomena as they naturally occur, while relying on qualitative methods to generate rich, in-depth data.

4.2. Study Population

The research was carried out in six Local Government Areas (LGAs) spanning the

three senatorial zones of Anambra State, Nigeria. The target population comprised 17,372 individuals, including caregivers, parents, and healthcare workers. A sample of 360 respondents was determined using the Krejcie and Morgan Table for sample size calculation. A sample size of 360 was considered appropriate because, according to the Krejcie and Morgan Table for sample size determination, it provides a statistically representative subset of a population of 17,372, ensuring adequate generalization of findings with acceptable precision and confidence.

4.3. Sampling Technique

This study was conducted using a multistage sampling technique. Initially, the state was divided into three senatorial zones—Anambra Central, Anambra North, and Anambra South—each consisting of seven LGAs. Subsequently, two LGAs were randomly selected from each zone for inclusion in the study. A multistage sampling technique was employed to enhance representativeness and manageability by selecting samples in successive stages, thereby ensuring adequate coverage of the study population while reducing cost and logistical complexity.

4.4. Sample Size Distribution

With a total sample size of 360, the participants were distributed as follows: 150 adolescents, 90 parents, 60 community leaders, 30 routine immunization service providers (health facility level), 24 health care providers (local government level) and 6 state-level immunization program officers to ensure adequate representation of the key stakeholder groups. The qualitative component comprised 12 Focus Group Discussions (FGDs) with adolescents, parents, health facility routine immunization service providers and community leaders while 20 Key Informant Interviews (KIIs) were conducted with state immunization program officers, local government immunization program officers and selected community representatives. This combination ensured both breadth and depth of data, with FGDs capturing shared experiences and KIIs providing expert and contextual insights.

4.5. Method of Data Collection and Analysis

For data collection, a structured interview guide was developed and used in the selected communities. Focus Group Discussions (FGDs) were conducted with members of the community including community leaders, parents, adolescents and healthcare providers. Key Informant Interviews (KIIs) were conducted with the state and LGA level immunization officers, health promoters and health care providers. The qualitative data generated alongside the survey were analyzed using a thematic analysis procedure following a systematic, multi-step process to ensure rigor and reproducibility. First, all interview and FGD recordings were transcribed verbatim and cross-checked against audio files for accuracy by two trained research assistants. Familiarization was achieved through repeated reading of the transcripts, after which initial open coding was conducted independently by two coders (the principal researcher and one assistant), who manu-

ally identified meaningful units of text related to knowledge, awareness, misconceptions, and information sources on HPV and the HPV vaccine. A preliminary codebook was then developed, and codes were compared, discussed, and refined through consensus meetings, where overlapping codes were merged and ambiguous ones clarified. Next, axial coding was applied to group related codes into broader categories (e.g., "awareness of HPV," "misconceptions," "sources of information," and "knowledge gaps"), which were subsequently synthesized into overarching themes reflecting patterns in participants' responses. Inter-coder discrepancies were resolved through discussion and, where necessary, consultation with a third reviewer to ensure consistency and credibility of the analysis. The final themes were reviewed against the raw data to confirm that they accurately represented participants' views, and illustrative excerpts were selected to support each theme. The analysis was conducted manually without the use of specialized qualitative data analysis software, although Microsoft Word and Excel were used to organize transcripts, codes, and thematic matrices.

5. Ethics Approval

This study was conducted in accordance with the Helsinki Declaration.

6. Consent for Participation

Written and verbally informed consent was obtained from all participants prior to their involvement in the study. Participation was voluntary, and confidentiality and anonymity were ensured throughout the research process. All procedures were conducted in accordance with ethical standards and the principles of the Declaration of Helsinki.

7. Consent for Publication

Written informed consent to publish was obtained from the study participants before enrolment in the study.

8. Results and Discussion

The result presented on Table 1 examined the perception of HPV and the HPV vaccine among parents, adolescents, and healthcare workers in Anambra State. The analysis revealed variations in awareness, attitudes, misconceptions, and trust in information sources across the study groups. Data from focus group discussions (parents and adolescents) and in-depth interviews (healthcare workers) were analyzed thematically.

8.1. Awareness and Knowledge

Parents exhibited moderate awareness of HPV, commonly associating it with cervical cancer but demonstrating limited understanding of the vaccine's purpose. One parent stated, "I know it [HPV] causes cervical cancer, but I am not sure how the vaccine works." This indicates a partial awareness of HPV-related health risks

but a gap in understanding the preventive potential of vaccination. Adolescents showed mixed knowledge: while some could identify HPV, many were unclear about transmission or vaccine function. A female adolescent noted, "I heard about HPV in school, but I thought it only affects girls when they are older." In contrast, healthcare workers exhibited high knowledge, accurately describing HPV types, transmission, and vaccination schedules. A nurse observed, "HPV is a virus that can cause cervical and other cancers, but vaccination can prevent infection if given before sexual debut." These findings suggest that professional training enhances awareness, while public and adolescent knowledge remains limited, highlighting the need for targeted education programs.

Table 1. Schematic representation of perception of HPV and HPV vaccine in Anambra state.

Participant Group	Themes	Sub-Themes/Observations	Illustrative Quotes/Insights
Parents	Awareness & Knowledge	Moderate awareness; linked HPV to cervical cancer; limited understanding of vaccine purpose	"*I know it [HPV] causes cervical cancer, but I am not sure how the vaccine works.*"
	Attitudes	Supportive (value prevention); Hesitant (concerns about safety, cultural/religious beliefs)	"*If this vaccine can protect my daughter from cancer, I will make sure she gets it.*" "*I am not sure about this vaccine; I don't want my child to have side effects.*"
	Misconceptions & Cultural Influence	Fear that vaccination encourages early sexual activity; moral/religious objections	"*If I give my child this vaccine, does it mean they can start having sex? That worries me.*"
	Trust in Information	Rely on healthcare providers; influenced by media and social networks	Parents prefer guidance from doctors and nurses over social media or hearsay.
Adolescents	Awareness & Knowledge	Mixed knowledge; some identify HPV, others confused about transmission and vaccine	"*I heard about HPV in school, but I thought it only affects girls when they are older.*"
	Attitudes	Generally willing to vaccinate if advised; influenced by peers and parents	"*If my parents or doctors say it is safe, I will take it, but I was worried at first.*"
	Misconceptions & Cultural Influence	Some confusion with treatment for infections; peer influence	Adolescents sometimes think vaccine treats disease rather than prevents it.
	Trust in Information	Trust in healthcare workers and parental guidance; social media influence	Adolescents rely on credible adult advice more than peers.
Healthcare Workers	Awareness & Knowledge	High knowledge; understand HPV types, transmission, and vaccine schedule	"*HPV is a virus that can cause cervical and other cancers, but vaccination can prevent infection if given before sexual debut.*"

Continued

Attitudes	Strongly supportive; proactive in community education	"*We always encourage parents to vaccinate their children early. Prevention is better than cure.*"
Misconceptions & Cultural Influence	Recognize parents' fears and cultural objections; advocate culturally sensitive education	"*Many parents are hesitant because of traditional beliefs. We try to explain that vaccination is about health, not morality.*"
Trust in Information	Critical role of communication; emphasize clarity and engagement	"*Parents listen more when the information comes from health workers rather than the internet or hearsay.*"

8.2. Attitudes toward Vaccination

Attitudes toward HPV vaccination varied significantly among groups. Parents demonstrated a dual attitude, showing support when they recognized preventive benefits but also hesitancy due to concerns about safety and cultural or religious beliefs. One parent said, "If this vaccine can protect my daughter from cancer, I will make sure she gets it," while another expressed caution: "I am not sure about this vaccine; I don't want my child to have side effects." Adolescents were generally willing to vaccinate, but their decision was influenced by parents and healthcare worker advice. One adolescent noted, "If my parents or doctors say it is safe, I will take it, but I was worried at first." Healthcare workers, however, were strongly supportive and proactive in promoting vaccination. A healthcare worker emphasized, "We always encourage parents to vaccinate their children early. Prevention is better than cure." The findings highlight that attitudes are shaped by both knowledge and perceived benefits, while hesitancy is largely driven by safety concerns and cultural factors.

8.3. Misconceptions and Cultural Influences

Misconceptions and cultural beliefs influenced vaccine perception. Some parents feared that vaccination might encourage early sexual activity, as reflected in the comment, "If I give my child this vaccine, does it mean they can start having sex? That worries me." Adolescents occasionally confused vaccination with treatment for existing infections. Healthcare workers were aware of these misconceptions and advocated for culturally sensitive education: "Many parents are hesitant because of traditional beliefs. We try to explain that vaccination is about health, not morality." This highlights that while knowledge is necessary, addressing cultural beliefs and misinformation is critical for improving vaccine acceptance.

8.4. Trust in Information Sources

Trust emerged as a key determinant of perception. Parents and adolescents relied heavily on healthcare workers for accurate information, often giving less credence

to social media or community hearsay. Most of their reasons for rejection are as a result of misinformation from social media, some religious leaders and so on. As a healthcare worker observed, "Parents listen more when the information comes from health workers rather than the internet or hearsay." The findings underscore the central role of healthcare providers in influencing perceptions and promoting vaccine uptake, particularly through clear and credible communication.

8.5. Overall Interpretation

Overall, perception of HPV and its vaccine reflects a gradient of awareness and acceptance. Healthcare workers demonstrated high knowledge and strong advocacy, adolescents were moderately receptive but dependent on parental and professional guidance, and parents showed cautious acceptance influenced by partial knowledge, cultural beliefs, and trust. These results indicate that improving perception and vaccine uptake in Anambra State requires targeted educational interventions, culturally sensitive communication, and active engagement of healthcare professionals as trusted sources of information.

The availability of HPV vaccines in health facilities in Anambra State presented on Table 2 was explored through in-depth interviews with healthcare workers and facility managers. Analysis revealed several critical themes influencing vaccine availability, including stock management, cold chain capacity, health worker training, accessibility, and policy support.

Table 2. Schematic representation of availability of the HPV vaccines in health facilities in Anambra state.

Theme	Sub-Theme/Finding	Illustrative Quotes/Observations
Vaccine Supply and Stock Management	Intermittent stock levels; frequent stock-outs	"*Sometimes we run out of the HPV vaccine for weeks because the next delivery has not arrived.*"
	Delays in replenishment from government and partners	"*We depend on state supply, but deliveries are irregular.*"
	Poor forecasting and ordering processes	Several facilities rely on manual stock registers that are often not up-to-date.
Cold Chain and Storage Capacity	Inadequate cold storage units	"*Our refrigerator is shared among several vaccines, and it often gets overloaded.*"
	Cold chain maintenance challenges (power outages)	Frequent electricity outages impact vaccine potency without reliable backups.
Health Worker Capacity and Training	Limited staff trained specifically on HPV vaccine logistics	"*Not all staff know how to handle HPV vaccine requirements or forecasting.*"
	Staff able to administer but lack vaccine stock management training	Facility personnel can administer when available but struggle to manage inventory.
Accessibility and Distribution	Uneven distribution across urban vs rural facilities	Urban facilities report more consistent supplies; rural ones face longer gaps.
	Outreach and community clinics report lower availability	Outreach campaigns sometimes exclude HPV due to limited supply.

Continued

Policy and Support Systems	Weak communication between facilities and supply chain managers	"*We often don't get advance notice of delivery schedules*."
	Perceived low priority of HPV vaccine within routine immunization logistics	Some staff feel HPV is treated as lower priority compared to childhood vaccines.

8.6. Vaccine Supply and Stock Management

Stock management emerged as a major challenge across facilities. Healthcare workers reported intermittent stock levels and frequent stock-outs, affecting the regular administration of HPV vaccines. One participant explained, "Sometimes we run out of the HPV vaccine for weeks because the next delivery has not arrived." Delays in replenishment from government or partner agencies were common: "We depend on state supply, but deliveries are irregular." Poor forecasting and ordering practices were also noted, with many facilities relying on manual stock registers that were often outdated. These findings suggest that inconsistent supply chains and inadequate inventory management significantly hinder vaccine availability.

8.7. Cold Chain and Storage Capacity

Cold chain limitations were identified as a barrier to vaccine availability. A significant proportion of health facilities rely on Solar Direct Drive (SDD) freezers as their sole source of cold chain infrastructure for the storage of vaccines and other temperature-sensitive medical commodities. These SDD freezers are designed to operate independently of grid electricity by harnessing solar energy, making them particularly suitable for rural and hard-to-reach settings where power supply is unreliable or entirely absent. As a result, they play a critical role in sustaining immunization services and safeguarding the potency of vaccines at the point of service delivery.

However, despite their strategic importance, a notable number of these SDD freezers are currently non-functional or performing below optimal standards. The causes of non-functionality are often multifaceted, including inadequate routine maintenance, delayed repairs, lack of trained technicians, aging equipment, damaged solar panels, battery system failures, and exposure to harsh environmental conditions. In some facilities, the absence of alternative cold chain equipment or backup power sources means that when an SDD freezer breaks down, there is no immediate substitute to ensure uninterrupted cold storage.

8.8. Health Worker Capacity and Training

Limited staff training in vaccine logistics further affected availability. While healthcare workers were generally capable of administering the vaccine, many lacked specific training in stock management and forecasting. As one staff member noted, "Not all staff know how to handle HPV vaccine requirements or forecasting." Facilities often relied on personnel who could deliver vaccines but strug-

gled to maintain adequate inventory levels. These results highlight the importance of capacity building for staff in both administration and logistics management.

8.9. Accessibility and Distribution

Accessibility of HPV vaccines varied across urban and rural facilities. Urban health centers generally reported more consistent supply, whereas rural facilities experienced prolonged stock gaps. Outreach and community clinics often reported lower availability, with HPV sometimes excluded from immunization campaigns due to limited supply. These disparities indicate that geographical location significantly affects vaccine access and highlight the need for equitable distribution strategies.

8.10. Policy and Support Systems

Policy and coordination challenges were also evident. Healthcare workers reported weak communication between facilities and supply chain managers, which hindered timely planning: "We often don't get advance notice of delivery schedules." Additionally, HPV vaccines were perceived as low priority compared to childhood vaccines within routine immunization programs. Some staff noted that this lower prioritization contributed to stock shortages and inconsistent availability. Strengthening policy support and supply chain coordination is therefore critical to improving HPV vaccine availability.

8.11. Overall Interpretation

Overall, the availability of HPV vaccines in Anambra State is constrained by multiple systemic factors. Inconsistent supply, cold chain limitations, uneven distribution, limited staff training, and low prioritization collectively reduce the reliability of vaccine provision. Urban facilities fare better than rural ones, highlighting geographic disparities. These findings suggest that improving HPV vaccine availability requires enhanced supply chain management, infrastructure investment, staff training, and prioritization of HPV vaccines within routine immunization policies.

The result presented on Table 3 explored the acceptance of the HPV vaccine among parents, adolescents, and healthcare workers in Anambra State. Data from focus group discussions with parents and adolescents, and in-depth interviews with healthcare workers, revealed patterns of willingness, barriers, influencing factors, and overall attitudes toward vaccination.

8.12. Willingness to Vaccinate

Willingness to vaccinate varied across the study population. Among parents, willingness was high when informed, as reflected in a parent's statement: "If the vaccine protects my daughter from cancer, I will make sure she receives it." Adolescents demonstrated moderate willingness, largely influenced by parental guidance and healthcare advice: "I would take it if my parents approve and the doctor says it is safe." Healthcare workers exhibited very high acceptance, consistently pro-

moting vaccination and emphasizing its preventive benefits: "We always encourage HPV vaccination; it is an essential preventive measure." These findings indicate that willingness is closely linked to knowledge and confidence in the vaccine's safety and efficacy.

Table 3. Schematic representation of acceptance of HPV vaccine among the study population.

Theme	Sub-Theme/Observation	Illustrative Quotes/Insights
Willingness to Vaccinate	High willingness among informed parents	"*If the vaccine protects my daughter from cancer, I will make sure she receives it.*"
	Moderate willingness among adolescents; influenced by parents	"*I would take it if my parents approve and the doctor says it is safe.*"
	Very high acceptance among healthcare workers	"*We always encourage HPV vaccination; it is an essential preventive measure.*"
Barriers to Acceptance	Safety concerns and fear of side effects (parents and adolescents)	"*I am worried the vaccine might harm my child or make her sick.*"
	Cultural and religious objections (parents)	"*Some people believe vaccines for girls are unnecessary before marriage.*"
	Misconceptions about vaccine promoting sexual activity	"*I heard giving this vaccine encourages early sexual behavior, so I am not sure.*"
Influencing Factors	Trust in healthcare workers	Participants indicated higher acceptance when health workers explain benefits and safety.
	Peer and community influence (adolescents)	Adolescents rely on peer experiences or community campaigns.
	Prior awareness and education	Those informed through schools, media, or health campaigns showed higher acceptance.
Overall Attitude	Parents: Moderate to High, conditional on safety and advice	Parents' acceptance is cautious but generally positive if informed.
	Adolescents: Moderate, dependent on parental and professional guidance	Adolescents are receptive but need reassurance.
	Healthcare Workers: Very High	Actively promote vaccination and advise communities.

8.13. Barriers to Acceptance

Despite overall positive attitudes, several barriers were identified. Parents and adolescents expressed safety concerns and fear of side effects, such as: "I am worried the vaccine might harm my child or make her sick." Cultural and religious objections also influenced parental decisions, with some believing vaccination is unnecessary before marriage: "Some people believe vaccines for girls are unnecessary before marriage." Additionally, misconceptions linking the vaccine to early sexual activity persisted: "I heard giving this vaccine encourages early sexual behavior, so I am not sure." These barriers highlight that vaccine hesitancy is influenced not only by safety concerns but also by cultural norms and misinformation.

8.14. Influencing Factors

Several factors positively influenced vaccine acceptance. Trust in healthcare workers emerged as a key determinant, with participants more willing to vaccinate when benefits and safety were clearly explained. Adolescents were influenced by peer and community opinions, while prior exposure to education campaigns through schools, media, or health programs increased receptivity. These findings emphasize that trusted information sources and prior awareness are crucial for improving acceptance.

8.15. Overall Attitude

The overall attitude toward HPV vaccination varied by group. Parents demonstrated moderate to high acceptance, conditional on assurances regarding safety and professional advice. Adolescents exhibited moderate acceptance, largely dependent on parental guidance and credible health information. Healthcare workers consistently showed very high acceptance, actively advocating for vaccination and encouraging community uptake. These patterns suggest that targeted communication and engagement strategies are necessary to address hesitancy and enhance vaccine coverage.

9. Conclusions

This study reveals qualitatively the individual, socio-cultural, and health system factors influencing the acceptance and utilization of the Human Papillomavirus vaccine in Anambra State. Findings reveal a high knowledge and acceptance among healthcare workers, who demonstrated high knowledge and strong advocacy for HPV vaccination, while parents and adolescents showed moderate awareness and conditional acceptance shaped by safety concerns, cultural and religious beliefs, and exposure to misinformation.

Although willingness to vaccinate was generally high when adequate information and reassurance were provided, persistent misconceptions from fears related to side effects and beliefs linking vaccination to early sexual activity continue to undermine acceptance. In addition, systemic challenges such as inconsistent vaccine supply, cold chain limitations, uneven urban-rural distribution, and limited training in vaccine logistics significantly constrained vaccine utilization, even among willing populations.

Notably, trust in healthcare workers emerged as a critical facilitator of acceptance, underscoring their central role as credible messengers and community advocates. The findings suggest that improving HPV vaccine uptake in Anambra State requires a multifaceted approach that combines targeted health education, culturally sensitive communication, strengthened supply chain systems, and enhanced capacity of frontline health workers.

10. Recommendations

1) Government to activate and routinise school health education programs in

Anambra state. School health sensitization focal persons should be appointed across the local government areas to ensure clear messages about vaccine safety and benefits are communicated continuously not just during vaccination campaign periods.

2) Government with the support of partners to strengthen public education and curb the infodemic by conducting comprehensive awareness campaigns targeting parents and adolescents to improve understanding of HPV, the benefits of vaccination, and dispel misconceptions.

3) Government and partners to strengthen high-level advocacy to influential religious leaders, traditional leaders and key stakeholders with the objective of building collaboration and ownership of HPV vaccination alongside other supplemental immunization activities.

4) Government, partners and program managers to improve vaccine supply chains, cold chain infrastructure, and distribution to ensure consistent availability, particularly in rural areas and underserved communities.

5) Healthcare Workers to provide culturally sensitive education, address safety concerns, and actively engage communities to increase HPV vaccine uptake.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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