



Efficacy of a School-Based Intervention On Human Papillomavirus Vaccination Attitude Among Adolescents in Zaria, Kaduna-State, Nigeria

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Abstract

The Human Papillomavirus (HPV) is the leading cause of cervical cancer and other neoplastic diseases. This study assessed the efficacy of a school-based intervention on HPV vaccination among adolescents in Zaria Education Zone, Kaduna State, Nigeria, using a mixed-method design that included quasi-experimental and survey approaches. A sample of 380 students was selected from eight schools. Data collection utilized the HPV Vaccination Attitude Questionnaire (HPVVAQ) and the Influence of School-Based Intervention on Vaccination Attitude Questionnaire (ISIVAQ), with reliability scores of 0.79 and 0.74, respectively. Analysis was performed using SPSS version 25, revealing a strong positive correlation between attitudes before and after the intervention ($p = 0.00$) and significant differences in vaccination attitudes favouring female students ($p = 0.01$). The study recommends that informed attitudes fostered through such interventions can enhance HPV vaccination acceptance and uptake, contributing to the prevention of HPV-related illnesses.

Keywords: Adolescents, Attitude, Efficacy, HPV, Intervention, School-based, Vaccination

Introduction

The Human Papillomavirus (HPV) is the most common cause of cervical cancer and other neoplastic diseases in both men and women. It is the second most frequent malignancy in women globally. The human papillomavirus is a sexually transmitted virus that is linked to 5% of all malignancies worldwide. It is expected that over 50% of sexually active men and women may be infected with HPV at some point in their lives (Ferlay et al. 2024). The Lancet Global Health study reveals that nearly one in three men over the age of 15 is infected with at least one type of genital human papillomavirus, while one in five harbours one or more high-risk, or oncogenic, HPV types (Baisley et al. 2024). A meta-analysis evaluated the prevalence of genital HPV infection among the general male population, indicating prevalence was to be about 31% for any HPV and 21% for high-risk HPV (WHO, 2023). HPV infection is the leading cause of cervical cancer, responsible for approximately 620,000 cancer cases in women and 70,000 in men in 2019 (WHO, 2024). Vaccination against HPV can effectively prevent these cancers. Many women's lives are cut short by

cervical cancer, and it is estimated that 80% or more of the worldwide incidence of cervical cancer occurs in underdeveloped nations (Beddoe, 2019). The crude incident rate in Nigeria is 17.1 for every 100,000 people, whereas the age-standardized incidence rate is 29.0 (HPV fact sheet, 2023). This means that 47.72 million Nigerian women are at risk for developing cervical cancer. These findings indicate that both males and females often carry genital HPV infections, highlighting the necessity of including men in initiatives aimed at controlling HPV infections and decreasing the incidence of HPV-related diseases in both genders.

On May 19, 2018, the Director-General of the World Health Organization called for global efforts to eliminate cervical cancer (Lancet, 2018), highlighting the importance of vaccinating preteens and screening adult women as part of a comprehensive strategy. Cervical cancer, which is the second most common cancer among women after breast cancer, poses a major public health challenge in countries with underdeveloped healthcare

systems. In Nigeria, there are only 11 cancer registries, most of which offer minimal screening services, resulting in a significant lack of data and no national cervical cancer screening program (Fagbule, 2020). Despite the availability of HPV vaccines in Western countries since 2006, Nigeria struggles with inadequate information on HPV vaccination delivery and currently, the HPV vaccine is not part of the free national immunization program and must be purchased out-of-pocket, limiting access for many who need it (WHO, 2024).

Young adolescents are particularly vulnerable to HPV infections due to rising rates of unprotected sexual activities, including oral and vaginal intercourse. However, there is a significant lack of information regarding HPV vaccination practices in Nigeria, especially among the WHO-recommended target group of 9-14-year-olds (Ohihoin, et al. 2022). This gap in awareness likely contributes to low rates of cervical cancer screening and HPV vaccination, as increased public knowledge about HPV and cervical cancer could lead to higher vaccination uptake (Ogunjimi & Afolabi, 2023). Research indicates that many Africans are uninformed about cervical cancer, highlighting the need for effective preventive strategies like vaccinating teenagers before they become sexually active (Mabeya & Muliira, 2023). The lifetime risk of contracting HPV is estimated to be over 80%, but despite the availability of vaccines, Nigeria has not yet incorporated the HPV vaccine into its standard immunization schedule (Kahn et al. 2020). Countries such as Australia, the U.S., Norway, Austria, and Germany have successfully implemented HPV vaccination programs as part of their routine immunizations (Patel et al., 2018), significantly reducing the incidence of HPV-related diseases among their populations. Lekoane, et al., (2019) assert that in Nigeria, despite a high prevalence of HPV-related illnesses, the absence of the HPV vaccine in routine immunization reflects a broader challenge in achieving national immunization goals. Effective collaboration between public health and primary care is essential for improving vaccination access and healthcare services. This partnership enables better data collection on infectious diseases, which informs public health responses and enhances community health outcomes through coordinated efforts in education and patient management.

Knowledge of HPV and acceptance of HPV vaccinations have been shown to rise with education on HPV-related illnesses in different contexts (Shapiro et al., 2017). Possible causes include a cultural reluctance to educate young people about STD prevention and sex

health issues. This research will bring attention to the importance of health education in ensuring that the HPV vaccination is widely distributed in the future. This will aid in containing the endemic virus that has spread across the nation. While there is a collective willingness among teens to learn about HPV and vaccination, targeted educational strategies are essential to address misconceptions and hesitancy. Furthermore, limited research exists on HPV awareness among Nigerian schoolchildren, highlighting the need for studies on adolescents' perceptions and readiness for vaccination. School-based interventions could help bridge knowledge gaps, although their effectiveness in changing perceptions remains uncertain. Additionally, potential gender disparities in attitudes towards HPV vaccination may impact overall vaccination rates. This research aims to explore these complex issues surrounding HPV vaccination among adolescents in Zaria by examining knowledge levels, prevalence rates, initial attitudes, intervention effectiveness, and gender differences. Also, it intends to determine whether an educational intervention targeting adolescents aged 10–19 in all 23 LGAs of Kaduna, Nigeria will be feasible and acceptable in terms of altering their knowledge and willingness with regards to HPV vaccinations.

Objectives of the Study

The study sought to:

1. ascertain the knowledge of HPV and the awareness level of the HPV vaccine among secondary school adolescents in Zaria, Kaduna state, Nigeria.
2. determine the prevalence of the infection among the participating adolescents in the selected secondary schools.
3. determine the attitude of adolescents towards HPV vaccination before the intervention.
4. determine the effect of a school-based intervention on HPV vaccination attitude among secondary school adolescents.
5. ascertain gender disparity in the attitude of adolescents toward HPV vaccination attitude among secondary school adolescents.

Research Questions

The research questions raised to guide the study are:

1. What is the level of knowledge regarding the HPV vaccine among secondary school adolescents in Zaria, Kaduna State, Nigeria?

2. What is the prevalence of HPV infection among secondary school adolescents in the selected schools?
3. What are the attitudes of adolescents towards HPV vaccination before any intervention?
4. How does a school-based intervention affect the attitudes of adolescents towards HPV vaccination?
5. Is there a significant gender disparity in attitudes towards HPV vaccination among secondary school adolescents?

Null Hypotheses

- HO₁:** There is no significant attitudinal change towards HPV vaccination among students after the intervention study
- HO₂:** There is no significant difference in attitudes towards HPV vaccination between male and female adolescent students.

Methodology

The research design is a mixed method consisting of non-equivalent groups Quasi and Survey. Zaria Education Zone in Kaduna state, North-West Zone, Nigeria was the focus of this research. It comprised four local government areas: Giwa, Sabon Gari, Soba and Zaria. The population of the study consists of all secondary school students (16,517) in the 2023/2024 academic session. Simple random sampling was utilized to choose two schools from each LGA to participate in the intervention and questionnaire survey. Additionally, balloting was used to select 377 students from the eight schools as the sample for the study based on Krejcie and Morgan's (1970) Table of sample size at 95% confidence level. The researchers sought permission from the Quality Assurance office to carry out the study in each local government area.

Two instruments used for data collection are the HPV Vaccination Attitude Questionnaire (HPVVAQ) and Influence of School-Based Intervention on Vaccination Attitude Questionnaire (ISIVAQ). The 5 Likert scale HPVVAQ questionnaire consists of four sections. Section A consists of 7 statements to elicit information on the biodata and vaccination status of respondents, Section B consists

of 10 statements to elicit information on the Knowledge level and awareness of HPV and HPV vaccination among adolescents, Section C consists of 6 statements to elicit information on Prevalence of HPV infection among adolescents Girls and Section D has 12 statements on Attitude of adolescents towards HPV vaccination. This is to determine their knowledge level before the intervention. The ISIVAQ is also 5 Likert scale and consists of two sections: Section A: biodata and Section B entails 15 statements to determine the Influence of School-Based Intervention on the Vaccination attitude of respondents. Both instruments were validated by science education experts from Ahmadu Bello University, Zaria. Reliability of instruments was done using the split-half method, which gave Cronbach alpha values of 0.79 and 0.74 respectively.

The Quality Assurance Unit of the four local government areas approved research in the participating schools. Participants were briefed on the study's goals and assured of their anonymity and confidentiality before agreeing to participate. Students, their parents, and their instructors all gave their informed agreement for this study to proceed. Everyone who took part did so voluntarily. It is not anticipated that any participant would experience any adverse stress due to participating in the research. Each participant first completed HPVVAQ as a baseline questionnaire after providing verbal informed permission before enrolment. After that, the researcher with the support of a health education teacher at each selected school conducted the school-based intervention: an 80-minute PowerPoint-oriented hands-on lecture to the selected students about HPV and HPV vaccination. Participants were then administered a post-intervention questionnaire ISIVAQ to determine their level of attitudinal change about HPV and HPV vaccination. The duration of the study was one month. All data collected with HPVVAQ and ISIVAQ were subjected to analysis using SPSS version 25. The decision rule taken was mean values ≤ 3.00 are disagreed and mean values ≥ 3.00 are agreed. Mean, standard deviation and mean difference were used to answer the research questions while Pearson's Product Moment Correlation Coefficient (PPMC) and independent samples t-test were used to test the null hypotheses at $\alpha \leq 0.05$ level of significance.

Results

Analysis of research questions and hypotheses was done and presented as follows:

Table 1: Summary of Response on the Level of Knowledge and Awareness regarding HPV vaccination among Secondary School adolescents.

S/N	Statements	Mean	SD	Decision
1	I have heard of HPV (Human Papillomavirus) before	3.10	1.59	Agree
2	I know what HPV is and how it is transmitted	2.91	1.40	Disagree
3	I am aware of the potential health risks associated with HPV infection	2.81	1.46	Disagree
4	I have received information about HPV Vaccination	3.02	1.54	Agree
5	I know that HPV vaccination is recommended for adolescents	3.19	1.50	Agree
6	I understand the benefits of getting vaccinated against HPV	3.22	1.46	Agree
7	I know the recommended age range for HPV vaccination	3.19	1.53	Agree
8	I have been vaccinated against HPV	2.76	1.58	Disagree
9	I rely on my sources of information for health-related decisions including HPV vaccination	3.31	1.47	Agree
10	I have misconceptions about HPV vaccine	3.17	1.64	Agree
Cumulative mean		3.07	1.52	

Benchmark: Mean ≥ 3.00 = Agree; Mean < 3.00 = Disagree

Table 1 sought to determine the level of knowledge regarding HPV and the HPV vaccine among secondary school adolescents in Zaria. The Table revealed that mean values ranging from 2.81 to 3.31

were obtained. A cumulative mean response of 3.07 was obtained for all the statements implying that they are moderately informed about HPV.

Table 2: Summary of Response to Prevalence of HPV Infection among Adolescents

S/N	Statements	Mean	SD	Decision
1	I have been diagnosed with human Papillomavirus (HPV)	2.57	1.54	Disagree
2	I engage in unprotected sex	2.97	1.62	Disagree
3	I have had an abnormal pap smear HPV test before	2.68	1.46	Disagree
4	I have experienced symptoms associated with HPV such as genital warts	2.80	1.56	Disagree
5	I often visit a healthcare Centre provided for routine check-ups	2.13	1.55	Disagree
6	I am aware of the risks associated with HPV infection	2.90	1.56	Disagree
Cumulative mean		2.68	1.55	

Benchmark: Mean ≥ 3.00 = Agree; Mean < 3.00 = Disagree

Table 2 revealed the cumulative mean response of 2.68 is less than the benchmark mean of 3.00 which implies not prevalent. Although all items had mean

values less than the benchmark mean set for acceptance of the statements.

Table 3: Summary of Attitudes of Adolescents towards HPV Vaccination Prior to the Intervention

S/N	Statements	Mean	SD	Decision
1	I have received the HPV vaccine	2.86	1.57	Disagree
2	I was influenced to get vaccinated	2.86	1.36	Disagree
3	I know about HPV and its associated risks	2.97	1.41	Disagree
4	I think HPV vaccination is important for adolescents	2.11	1.49	Agree
5	I have discussed HPV vaccination with my parents or guardians	2.75	1.39	Disagree
6	HPV vaccine is safe and effective towards prevention of infections	2.07	1.43	Agree
7	I have encountered barriers to receiving the HPV vaccine	2.89	1.50	Disagree
8	I believe that getting the HPV vaccine can prevent certain types of cancer	3.24	1.41	Agree
9	I feel the recommended age from 9-26 for receiving the HPV vaccine is adequate	3.25	1.44	Agree
10	I am aware of misconceptions or myths surrounding HPV vaccination	3.21	1.46	Agree
11	I will recommend the HPV vaccine to my friends and peers	2.16	1.53	Agree
12	I trust my sources of information when making decisions about vaccinations	2.25	1.55	Disagree
Cumulative mean		2.72	1.46	

Benchmark: Mean ≥ 3.00 = Agree; Mean < 3.00 = Disagree

Table 3 indicated a cumulative mean response of 2.72 and a standard deviation of 1.46 indicating that their response was negative. The attitude of the adolescents towards HPV Vaccination before the Intervention is poor.

Table 4: Influence of School-based Intervention on the Attitudes of Adolescents towards HPV Vaccination

S/N	Statements	Mean	SD	Decision
1	I have been educated about HPV and its prevention methods by the intervention study	4.24	1.01	Agree
2	The school-based intervention effectively increased my knowledge about vaccinations	3.97	1.04	Agree
3	I feel more positive and likely to get vaccinated after participating in the school-based intervention	4.11	0.97	Agree
4	The school-based intervention helped me understand the importance of vaccinations for public health	4.06	0.97	Agree
5	The school-based intervention has positively influenced my overall attitude towards vaccination	3.98	1.04	Agree
6	The intervention helped me understand the risks associated with HPV infection	4.27	0.87	Agree
7	I learnt about the different types of cancers that can result from HPV infection during the intervention	3.99	1.20	Agree
8	I am aware of the recommended age group for HPV vaccination after participating in the intervention	4.07	1.22	Agree
9	I believe that HPV vaccination is effective in preventing HPV-related diseases and developing cancer	3.87	1.19	Agree
10	The intervention provided clear explanations about how the HPV vaccine works and its safety	3.75	1.24	Agree
11	The intervention addressed common misconceptions and concerns about HPV vaccination	3.86	1.31	Agree
12	I feel comfortable discussing HPV vaccination with my parents/guardians	3.80	1.16	Agree
13	The intervention provided information about the potential side effects of the HPV vaccine	3.54	1.38	Agree
14	The intervention provided information on where to get vaccinated	3.54	1.37	Agree
15	I intend to encourage others to get vaccinated based on what you learned from the intervention program	3.78	1.29	Agree
Cumulative mean		3.92	1.15	

Benchmark: Mean ≥ 3.00 = Agree; Mean < 3.00 = Disagree

Table 4 showed that after the intervention, all the items attracted positive responses ranging from 3.54 to 4.24. The cumulative mean response of 3.92 and

standard deviation of 1.15 is an indication that the intervention enhanced the attitude of adolescents towards HPV vaccination positively.

Table 5: Summary Gender Disparity in Attitudes towards HPV Vaccination among Secondary School Adolescents

Variable	Gender	N	Mean	SD	Mean Difference
Attitude	Male	171	34.31	11.18	
Total	Female	201	37.77	10.07	3.46
		372			

Gender disparity in attitudes towards HPV vaccination among secondary school adolescents as presented in Table 5 indicated that mean responses of 34.31 and 37.77 were obtained for male and female secondary school adolescents respectively. From the

Table, it is evident that the female adolescent students develop positive attitudes more than their male counterparts as indicated by a mean difference of 3.46 was found between them in favour of the female adolescents.

Table 6: Correlation for Influence of HPV Intervention on Attitude of Students

Variables	N	\bar{X}	S.D	df	r-cal	p	Remark
Attitude Pre- Intervention	377	36.63	10.68				
Attitude Post-intervention	372	58.83	8.59	747	0.63	0.00	Sig.

r-crit = (0.14), $P < 0.05$

Table 6 revealed a mean score of 36.63 with a standard deviation of 10.68 for attitude before intervention against a mean of 58.83 with a standard deviation of 8.59 for attitude after intervention. A mean

difference of 22.20 was obtained in favour of the attitude of students' post-intervention. This reveals a positive correlation exists between attitude before and after intervention ($r = 0.63$, $n = 587$, $p = 0.00$).

Table 7: Summary of t-test Analysis for Difference in Attitude towards HPV Vaccination between Male and Female Adolescent Students

Groups	N	Mean	Std. Dev	df	t-cal	p-value	Decision
Male	171	34.31	11.18				
				370	2.75	0.01	Significant
Female	201	37.77	10.07				

$P < 0.05$, t crit 1.65 < 6.41 at df 120

The results in Table 7 from the independent samples t-test analysis showed a p-value of 0.01 is less than the $p\text{-value} \leq 0.05$ set for acceptance or rejection of the hypothesis. This is an indication that there is a significant difference in attitude towards HPV Vaccination between male and female adolescent students.

Discussion

This study was conducted to ascertain the efficacy of a school-based intervention on human papillomavirus vaccination attitudes among adolescents in Zaria, Kaduna State, Nigeria. Based on the results presented in this study, there is a clear and encouraging perspective on how effective the intervention was at improving attitudes toward HPV vaccination among adolescent students.

Table 1 sought to determine the level of knowledge regarding the HPV vaccine among secondary school adolescents in Zaria. A cumulative mean response of 3.07 was obtained for all the statements implying that they are moderately informed about the HPV vaccine. Specifically, secondary school adolescents indicated that they rely on their sources of information for health-related decisions including HPV vaccination. This suggests a lack of structured educational programs on HPV in schools. Results imply that students are knowledgeable about HPV vaccines in Zaria but disagree with taking HPV vaccination. This reliance may lead to misinformation or incomplete understanding, contributing to their disagreement with HPV vaccination. Additionally, cultural beliefs and societal attitudes towards vaccination may create hesitancy, particularly among adolescents. The study also highlights that despite some knowledge, the overall awareness and acceptance of HPV vaccination remain low, indicating a need for comprehensive health education initiatives to improve understanding and encourage vaccination uptake among this demographic. A study conducted by Yahya et al (2024) among women attending antenatal clinics in Zaria found that only 15.4% were aware of the HPV vaccine, with just 4.5% demonstrating good knowledge about it. This highlights a broader issue of low awareness that may also affect adolescents.

Findings from Table 2 revealed the response on the prevalence of HPV infection among adolescents in Zaria, Kaduna State. A cumulative mean response of 2.68 was obtained, which is less than the benchmark mean of 3.00 which implies no prevalence. Firstly, the lower mean score may stem from insufficient educational initiatives regarding sexually transmitted infections and their consequences. Additionally, cultural beliefs and stigma surrounding sexual health may discourage open discussions about HPV, leading to underreporting and misunderstanding of its prevalence. Furthermore, the relatively low engagement in risky sexual behaviours among adolescents in Zaria could contribute to the perceived low prevalence of HPV infections. Lastly, the absence of routine screening and testing for HPV in the community may result in a lack of data on actual infection rates, reinforcing the notion that HPV is not a prevalent concern among adolescents. These factors collectively highlight the need for enhanced educational efforts and health interventions to address HPV awareness and prevention. Cosmas et al (2022) in their study conducted in Jos, North-Central

Nigeria found that the prevalence of HPV among adolescent girls aged 9-20 years was 13.2%, with higher rates observed at ages 16 and 17 years. Another study by Ohihoin et al. (2022) focusing on women in Kaduna reported a high prevalence of high-risk HPV infections, with a notable 34% prevalence rate among sexually active women aged 18 to 30.

The attitude of adolescents towards HPV vaccination before the intervention as presented in Table 3 indicated that their response was negative, that is poor attitude. Respondents also disagreed with discussing HPV vaccination with their parents or guardians. The negative attitude of adolescents towards HPV vaccination prior to the intervention may be attributed to several factors. Firstly, a lack of comprehensive education about HPV and its vaccine can lead to misconceptions and fear, resulting in poor attitudes. Many adolescents may not have had adequate discussions about HPV, as indicated by their reluctance to talk about vaccination with parents or guardians, which suggests a gap in communication and support from family members. Additionally, cultural beliefs and societal stigma surrounding sexual health may contribute to hesitancy regarding vaccination. The perception that HPV is not a significant health threat could also influence their attitudes negatively. Furthermore, limited access to reliable information sources and the influence of peers or misinformation can exacerbate negative perceptions about the vaccine. Overall, these factors highlight the need for targeted educational interventions to improve understanding and acceptance of HPV vaccination among adolescents. Ephrem et al., (2023) revealed that a significant percentage of adolescents exhibited insufficient knowledge and negative attitudes towards HPV vaccination. The study found that many adolescents were reluctant to discuss HPV vaccination with their parents, reflecting a cumulative mean response indicating poor attitude levels. Brunelli et al. (2021) revealed that in Northern Italy many adolescents were not involved in the decision-making process regarding HPV vaccination, with parental influence being predominant. This lack of communication often resulted in negative attitudes, as many students expressed discomfort in discussing vaccination with their parents, leading to lower engagement in vaccination uptake. Galvão et al. (2023) buttressed that cultural perceptions surrounding HPV and its association with sexual health negatively impacted adolescents' willingness to discuss vaccination openly

with their families. This cultural barrier contributed to a cumulative mean response indicating adolescents' poor attitudes towards the vaccine.

The findings indicate that a school-based intervention significantly improved adolescents' attitudes toward HPV vaccination, as shown in Tables 4 and 6. After the intervention, the cumulative mean response of 3.92 and a standard deviation of 1.15 suggest a notable enhancement in attitudes. Notably, students reported increased education about HPV and its prevention. Before the intervention, the attitude towards HPV vaccination was relatively low, but it improved significantly afterwards, indicating a notable increase in positive responses and a decrease in variability among participants' attitudes. The strong positive correlation ($r = 0.63$, $p < 0.001$) between pre and post-intervention attitudes further confirms the effectiveness of the intervention in fostering more favourable views on HPV vaccination. The rejection of the null hypothesis ($p = 0.00$) reinforces this conclusion, aligning with previous studies which demonstrated that education on HPV-related illnesses enhances knowledge and acceptance of vaccinations across various contexts. Studies Iova et al. (2023), Galvão et al. (2023) and Sonawane et al. (2024) conducted in Romania, Brazil and the United States of America respectively all demonstrated that school-based health education programs significantly improved students' knowledge and attitudes toward HPV vaccination.

The analysis of gender disparity in attitudes toward HPV vaccination among secondary school adolescents reveals that female students exhibit more positive attitudes than their male counterparts ($p = 0.01$). This suggests that female adolescents may be more receptive to HPV vaccination, potentially due to greater awareness of HPV risks or cultural factors that prioritize women's health in vaccination campaigns. Supporting studies indicate similar trends, with research showing higher willingness to receive the HPV vaccine among females compared to males, as well as greater knowledge levels about the vaccine. For instance, Galvão et al. (2022). in Brazil found that 92.7% of vaccinated females had satisfactory knowledge about HPV, compared to only 46.5% of males. The finding of Chen et al. (2022) on gender differences in knowledge and attitude towards HPV and HPV vaccine among college students in Wenzhou, China found that a total of 55.9% of males and 80.4% of females indicated that they would be willing to

receive the HPV vaccine, a significant difference ($p < 0.001$). Brunelli et al. (2021) found that girls were twice as likely to have received at least one dose of the HPV vaccine compared to boys (55.8% vs. 18.0%). The findings underscore the necessity for targeted educational interventions to bridge the gender gap in vaccination attitudes, as societal perceptions often frame HPV as primarily a women's health issue (Akpor, 2023), contributing to lower awareness and negative attitudes among males. A multicenter study by Ephrem et al., (2023) in Ethiopia revealed that female students had a better attitude towards HPV vaccination, with factors such as being in secondary school and having health workers as sources of information positively influencing their perceptions. Comprehensive health education that engages both genders is essential for addressing these disparities.

Conclusion

The study highlights the need for improved public health initiatives to enhance awareness and attitudes toward HPV vaccination among adolescents in Zaria. It reveals a moderate level of HPV knowledge among secondary school students, indicating a demand for better educational interventions integrated into school curricula. The low awareness of HPV infection, particularly among girls, suggests a gap in public health messaging that could be addressed through routine health check-up campaigns focused on HPV education. Additionally, the findings show a gender disparity in vaccination attitudes, with females responding more positively than males, emphasizing the need for targeted campaigns aimed at male adolescents. Overall, the positive impact of the intervention reinforces the importance of collaboration between schools and healthcare providers to foster open discussions about HPV and vaccination, ultimately creating a supportive environment for increased vaccination uptake.

Recommendations

1. Kaduna state government in collaboration with NGOs should organize targeted educational programs such as interactive workshops, seminars, peer-led discussions and follow-up sessions in secondary schools to increase understanding of HPV and its prevention, thereby encouraging positive attitudes towards vaccination.
2. Kaduna state government should collaborate with local healthcare providers to establish

routine health check-up campaigns that specifically focus on HPV education and screening.

3. Kaduna state government, NGOs and Parents should endeavour to develop family-oriented educational resources that facilitate open communication about HPV and vaccination.
4. Campaigns should consider gender-specific concerns or barriers, ensuring that males are equally engaged and informed about the benefits of HPV vaccination.

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