Knowledge, Attitudes and Uptake of Human Papillomavirus Vaccines Among Secondary School Students in Ibadan North, Oyo State, Nigeria

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ABSTRACT

Background: *The aim of this study was to critically assess the knowledge, attitudes and uptake of Human Papilloma Virus Vaccines among secondary school students in Ibadan, Oyo state, Nigeria.*

Methods: *A descriptive cross-sectional survey was employed. The Statistical Package for Social Sciences (SPSS) version 23 was used to analyse the data. Descriptive statistics were employed to analyse socioeconomic data and research topics. Inferential statistics, Chi-square at a significance threshold of 0.05, were employed to evaluate three established null hypotheses.*

Results: *Findings of the study revealed that 72.8% were between 15-17 years with a mean age of 15.56±1.36. A majority (77.5%) of the respondents were from Yoruba stock, and nearly 68.9% were Christians. Those reported to have good knowledge of HPV vaccine were 26.3%, and almost 55.9% had positive attitude towards HPV vaccine. About 6.8% had taken HPV vaccine. Knowledge ($p<0.000$) and attitude ($p<0.034$) were significantly associated with uptake of HPV vaccine.*

Conclusion*: Based on the outcomes of this study, it was determined that there was a low degree knowledge and a high positive attitude towards HPV vaccination, as well as a low uptake of HPV. This recommended that information about HPV and HPV vaccination be made available to raise the level of awareness and uptake of HPV vaccine among secondary school students in Ibadan, Oyo state.*

Keywords: Knowledge, Attitude, Uptake, Human Papillomavirus Vaccines, Students

INTRODUCTION

Human papillomavirus (HPV) infection is the most common STI worldwide, with 570,000 cases and 311,000 deaths due to it in 2018. It is the fourth most frequently diagnosed cancer and the fourth leading cause of cancer death in women.[1] In South Asia, the age-standardized incidence rate of cervical cancer is 16.4 per 100,000 women, compared to an average of 10 per 100,000 in the developed world.[2] Persistent infection with high-risk human papillomavirus (HPV) has been established as a necessary cause of

cervical cancer.[3] Primary prevention of cervical cancer by HPV vaccination and secondary prevention by screening have been proved to be the two most effective ways to prevent invasive cervical cancer.

However, regular screening is beyond the scope of most developing countries due to high costs, limited health infrastructure, competing health policy priorities and limited healthcare personnel. HPV vaccination provides an opportunity to low-resource settings, to reduce the burden of cervical cancer through primary prevention and successful HPV vaccination uptake among the target population of adolescents. Three prophylactic HPV vaccines are licensed for use in the United States: 9-valent (9vHPV, Gardasil 9, Merck), quadravalent (4vHPV, Gardasil, Merck), and bivalent (2vHPV, Cervarix, GlaxoSmithKline). As of late 2016, only 9vHPV is being distributed in the United States. Most of all HPV-associated cancers are caused by HPV 16 or 18, types targeted by all three vaccines.[4]

HPV vaccination coverage has been increasing in the United States but is still below the Healthy People 2020 target of 80% of adolescents. However, interest in obtaining HPV vaccines has been reported among adolescents and young females in many countries worldwide yet uptake has remained low. In 2013, the vaccine manufacturers (Merck and GSK) offered the Global Alliance on Vaccines and Immunization (GAVI) a reduced price of US$4.50 per dose from the initial selling price of US$30–40.[5]

The Human Papillomavirus (HPV) vaccine has the potential to greatly reduce the incidence of cervical cancer by protecting against HPV infections. However, levels of knowledge and vaccination uptake are consistently low in various countries. In 2019, 100 countries have introduced HPV vaccine into national schedule. A study showed that the HPV6/11/16/18 vaccine was 95%–100% effective in reducing HPV16/18-related high-grade cervical, vulvar, and vaginal lesions, and 97% effective in reducing HPV6/11-related genital warts. In 2013, the vaccine manufacturers offered the Global Alliance on Vaccines and Immunization (GAVI) a reduced price of US$4.50 per dose to ensure access for developing countries.[6]

This study aimed to find out the level of knowledge, attitudes and uptake of HPV vaccines among adolescent secondary school girls in Ibadan north, Oyo state, Nigeria. Cervical cancer is the 2nd most frequent cancer among women in Nigeria and the 2nd most frequent cancer among women between 15 and 44 years of age.[7] About 3.5% of women in the general population are estimated to harbor cervical HPV-16/18 infection at a given time, and 66.9% of invasive cervical cancers are attributed to HPVs 16 or 18. Ranking of cervical cancer incidence to other cancers among all women according to highest

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incidence rates (ranking 1st) excluding non-melanoma skin cancer and considering separated colon, rectum and anus.[8]

HPV is a common sexually transmitted infection implicated in 5% of cancers globally, including most cervical cancer cases. In the UK, HPV vaccine has been offered to girls aged 11-13 years and cervical cancer screening to women aged 25-64 years since 2008. Universal health coverage remains a global challenge due to limited resources and ineffective health systems.[9] In Nigeria, cervical cancer is the most common genital tract malignancy among women and can be prevented by HPV immunization and regular screening. HPV 16 and 18 are the most important risk factors for cervical cancer, but other predisposing factors include early age of sexual activities, early marriage, multiple sexual partners, unprotected sex, long-term use of hormonal contraceptives, increased pregnancies, smoking, and unhygienic practices.[10]

In Nigeria, HPV vaccines are only available in private health facilities, but efforts are being made to include them as part of routine immunization. Cervarix, Gardasil, and Gardasil 9 are highly effective for the prevention of HPV.[11]

A study associated many vaginal, oral, oral-anal, same-sex partners, early initiation of intercourse, and a history of sexually transmitted illnesses to an increased risk of HPV infection.[12] Multiple sexual partners were shown to increase the risk of HPV infection in a cohort study of pregnant women in Finland. A survey of Greek males discovered that guys who have sex with men have a greater chance of HPV infection.[13] The European Prospective Investigation into Cancer and Nutrition (EPIC) study, which included Denmark, France, Germany, Greece, Italy, the Netherlands, Norway, Spain, Sweden, and the United Kingdom, discovered that using oral contraceptives for an extended period of time increased the risk of HPV-related diseases such as cervical cancer. Tobacco use, alcohol intake, and HIV all reduce immunity's efficiency in combating HPV infection.[14]

University students are prone to 14 HPV infections because to their age and sexual practices, although different research demonstrate differences in student understanding, attitude, and practice.[15] According to a Polish survey of high school and female university students, 30.1% were uninformed about the HPV vaccination, and 91.5% had not been vaccinated.[15] In an Italian research, 17.1% had heard about HPV vaccinations, and 4.2% had received them.[15] This was lower than in Ottawa, Canada, where 73.2% were vaccinated and 50% planned to receive the vaccination.[16] A research conducted in Hong Kong among female university students indicated that 95.9% were aware of HPV, 92.8% were aware of the HPV vaccination, and 47.2% had received the vaccine.[17]

From 2015 to 2016, a survey was undertaken among university students in underdeveloped nations such as Pakistan to measure knowledge, attitudes, and views of HPV. 53% of the students were uninformed of the HPV vaccination, and 64% were unfamiliar of the HPV vaccine as a cervical cancer prevention strategy.[18] Knowledge, attitude, and perception of HPV vaccine was conducted among female university students in Lebanon between 2013 and 2014, findings show that only 36.5% were uninformed of the HPV vaccination. A dual review [19] and [20] review and [21] urge rigorous education to increase HPV vaccination understanding.

Given that the summarized research shows a consistent pattern of knowledge, attitude and uptake of HPV vaccine uptake among secondary school female students, more information is needed to examine the impact of socioeconomic related factors such as the impact of parental decision and attitude towards the uptake of HPV vaccine among adolescents and young people.

METHODS

A descriptive cross-sectional survey was employed to assess the knowledge, attitudes and uptake of Human Papilloma Virus vaccine among secondary school students with the aid of multi-staged sampling. Eligible participants included all the female students in SS1, SS2, and SS3 of the seven selected schools. This study was approved by the Ethical committee, University College Hospital Ibadan. Informed consent was obtained from respondents before enrolment into the study.

Data was collected using self-administered questionnaire after obtaining ethical approval and necessary permission from the appropriate authority. Two registered Community Health Officers were trained to work with the researcher in the data collection. The data collection took five days, from 13th July to 17th July 2021. The questionnaires were administered to the participants after the purpose of the study had been explained to them and they had voluntarily agreed to participate in the study. We handed out copies of the questionnaire to participants and retrieved them on the spot. At this stage, explanations were necessary to ensure that the participants understood the purpose and importance of the study. Regarding respondents who had lower reading comprehension, researchers would read the instructions and questions without any additional interpretation or explanation. To improve the response rates, all participants received a beautiful pen as reward before the survey. Participants independently completed the questionnaire, and all the questionnaires were anonymous.

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Data obtained from the administered questionnaires was coded and analysed using Statistical Package for Social Sciences (SPSS) version 23.0. The socio-demographic characteristics and the research questions were analysed using percentage and frequency count as well as mean. Chi-square statistical tool was used in testing all the hypotheses at a 0.05 level of significance.

RESULTS

Participants' Socio-demographic Data

A total of 348 students who met the inclusion criteria were sampled during the study period. Research question items were obtained from 342 respondents, resulting in a response rate of 99 percent. The demographic information of participants is displayed in Table 1. The mean age of participants was 15.56 years (standard deviation [SD] = 1.36, range 12-20 years). The majority are aged between 15 and 17 years. Furthermore, individuals without a weekly allowance constituted a majority, totaling 233 (68.9%), compared to those receiving weekly allowances, which numbered 105 (31.1%). The study revealed that 190 individuals (56.2%) possessed a phone, whereas 160 individuals (27.3%) had access to social media.

Table 1: Socio-demographic data (N=338)

Socio-demographic Data	Frequency	Percent
Age		
12-14 years	71	21.0
15-17 years	246	72.8
18-20 years	21	6.2
Level of Education		
SS1	161	47.6
SS2	147	43.5
SS3	30	8.9
Tribe		
Igbo	50	14.8
Yoruba	262	77.5
Hausa	13	3.8
Others (Edo, Igbira, Efi, Ibiobio, etc.)	13	0.6
Religion		
Christianity	172	50.9
Islam	160	47.3
Traditional	5	1.5
No religion affiliation	1	0.3

Getting of Weekly allowance		
Getting	105	31.1
Not getting	233	68.9
Ownership of Phone		
Owned a phone	190	56.2
Do not own a phone	148	43.8
Use of social media		
Users	160	47.3
None Users	178	52.7

Mean age ± Standard deviation = 5.56±1.36

Table 2 showed that 256 (75.7%) respondents had never heard of HPV vaccination. Most of the 82 students who said they heard about it learned about it from the news or social media, 18 (22.0%) from health facilities, 15 (18.3%) from teachers, and very few from family (4.9%), friends (1.2%), neighbors (1.2%), and school (6.3%). 239 (70.7%) of respondents claimed HPV vaccines are for women, 90 (26.6%) said they're for both, and 9 (2.7%) said they prevent cervical cancer. Seventy percent mentioned the health facility, 11 (3.3%) the church, and 4 (1.2%) the school as HPV vaccine providers. 143 (42.3%) knew HPV vaccines are extremely effective on non-sexual people. Most respondents (66.0%) don't realize HPV vaccines require three doses, although 115 (34.0%) do. Above average, 176 (52.1%) were unaware that HPV vaccines can be given to 9-26-year-olds, while 162 (47.9%) were. 56% of students said the second HPV injection is given two months later, whereas 150 (44.4%) disagreed.

Table 2: Knowledge of Papillomavirus Vaccine among Participants

Variables and Responses	Frequency	Percent
Heard about HPV vaccine		
Yes	82	24.3
No	256	75.7
Source of information (n=82)		
Health facilities	18	22
Teachers	15	18.3
Family	4	4.9
Friends	1	1.2
Neighbour	1	1.2
School	6	7.3
News/social media (majority)		
Who is the HPV vaccine for?		
Females only	239	70.7

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Both male and female	90	26.6
Prevents cervical cancer	9	2.7
Where can HPV vaccine be accessed?		
Health facility	237	70.1
Church	11	3.3
School	4	1.2
HPV vaccine effective before sexual activity		
Yes	143	42.3
No / Don't know	195	57.7
HPV vaccine given in 3-shot series		
Yes	115	34
No	223	66
HPV vaccine for ages 9–26 years		
Aware	162	47.9
Not aware	176	52.1
Second dose given two months after first		
Agree	188	56
Disagree	150	44.4

Participants' Attitudes towards Uptake of Papillomavirus Vaccine

Secondary school students' attitudes toward the HPV vaccine are shown in Table 3. According to the results, a sizable percentage of students indicate good attitudes toward the vaccine, whilst a lesser percentage show uncertainty or negative sentiments. The table shows that 112 (33.1%) respondents believed the HPV vaccination to be harmful, while 192 (56.8%) respondents believed it to be beneficial. While 103 (30.5%) believed HPV to be detrimental, 188 (55.6%) believed it to be good. While 107 (30.7%) believed HPV was ineffective, 186 (55.5%) believed it was helpful. 49.9% of respondents thought the vaccination was acceptable, whereas 112 (33.1%) thought it was unfavorable. 100 people (29.6%) believed the HPV vaccine was ineffective, whereas 206 people (60.9%) believed it to be successful.

Table 3: Extent of feeling towards HPV vaccine (N=338)

Variables	Frequency	Percent
The extent of benefit towards HPV vaccines		
Harmful	112	33.1
Beneficial	192	56.8
Not sure	34	10.1
The extent of good towards HPV vaccines		
Bad	103	30.5
Good	188	55.6
Not sure	47	13.9
The extent of worth towards HPV vaccines		
Worthless	107	31.7
Useful	186	55.0
Not sure	45	13.3
The extent of desire towards HPV vaccines		
Undesirable	112	33.1
Desirable	165	48.8
Not sure	61	18.0
The extent of effective towards HPV vaccines		
Ineffective	100	29.6
Effective	206	60.9
Not sure	32	9.5

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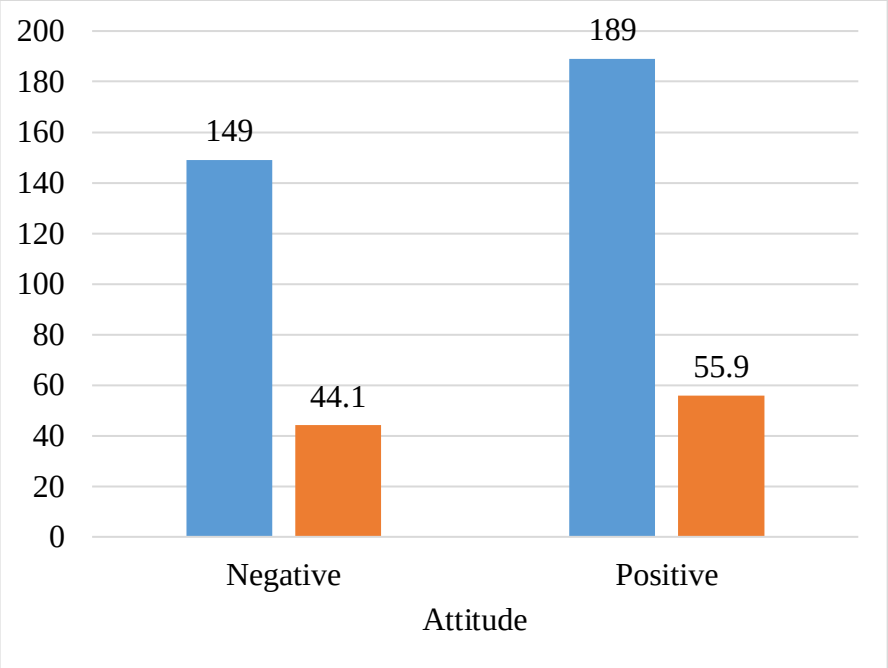

Figure 1. Participants' Attitude towards HPV Vaccine Uptake

Uptake of HPV Vaccine among Participants

According to Table 4, most participants (283, 83.7%) had no sexual experience. Of those who had sexual experience, 27 (49.1%) stated that they always use contraception when having sex, 18 (32.7%) stated that they do not use contraception, and 10 (18.2%) stated that they occasionally use contraception. There were 23 (6.8%) and 315 (93.2%) who had received at least one HPV vaccination infusion. The majority (13 (56.55%) of individuals who got at least one HPV vaccination shot were between the ages of 15 and 16, 6 (22.61%) were between the ages of 13 and 14, and 4 (17.4%) were between the ages of 17 and 18. About 16 (69.6%) of them had received at least one HPV vaccine shot, while 5 (22.17%) of them had two shots, and 2 (8.7%) of them had three shots.

Table 4: Uptake of HPV vaccine (N=338)

Variables	Frequency	Percent
Sexual history		
Sexual intercourse experience	55	16.3
No sexual intercourse experience	283	83.7
Sexual experience(s) (n=55)		
Always with the use of contraception	27	49.1
Always without the use of contraception	18	32.7
Sometime with the use of contraception	10	18.2
Receiving of at least one shot of the HPV vaccine		
Received	23	6.8
Never Received	315	93.2
Age of Participants (n=23)		
13-14 years	6	26.1
15-16 years	13	56.5
17-18 years	4	17.4
Number of HPV vaccine shots received)		
One shot	16	69.6
Two shots	5	21.7
Three shots	2	8.7

A Chi square (謙2) analysis revealed a strong correlation between HPV vaccine uptake and attitude towards the virus among secondary school students in Ibadan North, Oyo state. Most (15 (65.2%) of those who had at least one HPV vaccine had a negative impression concerning it. Interestingly, 8 (34.8%) of those with positive attitudes received at least one HPV vaccine. Due to the p-value of 0.05, the hypothesis that there is no significant association with HPV attitude and HPV vaccine uptake among secondary school students in Ibadan North, Oyo state was rejected. A Chi square (□□2) analysis revealed a strong correlation between HPV knowledge and vaccine uptake. Nearly 17 (73.9%) with high knowledge had received an HPV vaccination. The Chi square (孢2) analysis revealed a strong correlation between sexual exposure and HPV vaccine uptake. The null hypothesis that sexual exposure did not affect HPV vaccination uptake among secondary school students in Ibadan North, Oyo state, was rejected.

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Table 5: Association between attitudes towards HPV and uptake of HPV vaccine

Attitude towards HPV	Have you received at least one shot of the HPV?		Total	Chi-square	P-value
	Received	Never Received			
Negative	15	134	149	4.472	0.034 *
	65.20%	42.50%	44.10%		
Positive	8	181	189		
	34.80%	57.50%	55.90%		

**Significant at 0.05 level*

Table 6: Association between knowledge of HPV vaccine and uptake of HPV vaccines

Knowledge on HPV vaccine	Have you received at least one shot of the HPV?		Total	Chi-square	P-value
	Received	Never Received			
Poor	6	243	249	28.804	0.000 *
	26.10%	77.10%	73.70 %		
Good	17	72	89		
	73.90%	22.90%	26.30 %		

**Significant at 0.05 level*

Table 7: Association between sexual exposure and uptake of HPV vaccine

Sexual history	Uptake of HPV vaccine		Total	Chi-square	P-value
	No	Yes			
Sexual experience	47	8	55	6.207	0.01273 *
	14.9%	34.8%	16.3%		
No sexual experience	268	15	283		
	85.1%	65.2%	83.7%		

**Significant at 0.05 level*

DISCUSSION

This study was designed to assess the knowledge, attitude, and uptake of HPV vaccine among senior secondary school students in Ibadan North LGA, Oyo Sate. Almost half (47.6%) of the respondents were in SS 1 class and predominantly between 15-17 years with a mean age of 15.561.36. A majority (77.5%) of them were from the Yoruba tr, and nearly 68.9% were Christians. Fifty-six percent of them owned phones and 52.7% used the social media. Knowledge has been viewed as an important predictor of HPV vaccine uptake,[22] and the first research question of this study sought to assess the level of knowledge of Human Papillomavirus Vaccine in the prevention of cervical cancer among secondary school students in Ibadan North, Oyo State.

In this study, respondents' knowledge was significantly associated with HPV vaccines uptake ($p<0.000$). The proportion of those with good knowledge about HPV vaccine was 26.3%. This study examined the knowledge, attitude, and uptake of HPV vaccine among secondary school students in Ibadan North LGA, Oyo State Nigeria. It found a significant association between attitude and uptake of HPV vaccine ($p<0.034$). Other studies conducted in Lagos state Nigeria and five geopolitical zones in Nigeria also documented a very poor level of knowledge of HPV and HPV vaccines.[23]

However, two studies and found that a substantial proportion (59.3%) of respondents had good knowledge about the HPV vaccine before they were recruited in their study. The discrepancy could be linked to the fact that students in colleges of medicine or health sciences are expected to have high or good level of knowledge about HPV and HPV vaccines.[24, 25] The second question in this research was, what is the attitude of secondary school students towards human papillomavirus vaccine among secondary school students in Ibadan North LGA, Oyo State Nigeria? The current study found a significant association between attitude and uptake of HPV vaccine. This study found that 55.9% of secondary school students in Ibadan North LGA, Oyo State Nigeria had positive attitude towards HPV vaccine. This is consistent with other studies which found that most students have positive attitude towards HPV vaccination. The third question in the study was the level of uptake of human papillomavirus vaccine among secondary school students in Ibadan North LGA, Oyo State Nigeria. It was found that only 6.8% had taken HPV vaccine, which agreed with those of previous studies, in which 1.2% were vaccinated in Ethiopia,[24] 3% vaccinated in China,[26] and an earlier study conducted in Nigeria.[10] Similarly, a study reported that 40.5% of the students had received at least one shot of HPV vaccination before getting enrolled in their study in Italy. This inconsistency may be due to the region and form of healthcare delivery system.[27]

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This research focused on seven public secondary schools in Ibadan North LGA, Oyo State. It only assessed senior secondary school girls from the seven selected schools and did not measure male and female HPV vaccination knowledge, attitude, or uptake. The data reveal HPV vaccine awareness, attitude, and uptake among senior secondary school students in Ibadan North LGA, Oyo State. This may help stakeholders in the region create and implement health policies for adolescents and young people.

This study also indicated that nurses need capacity-building initiatives to educate adolescents and young people about HPV and the vaccine. HPV prevention requires school mobilization, especially among sexually active people. HPV awareness and prevention should be promoted to secondary school pupils. This could be a significant family burden if ignored.

Studies show that HPV awareness and knowledge are low, but individuals with good attitudes toward the vaccine are more likely to get it. There was a substantial connection between attitude and HPV vaccine uptake, but not knowledge.

This study advises providing HPV and HPV vaccination information to secondary school students in Ibadan city, Oyo state, to enhance HPV vaccine understanding and uptake. Improving the academic curriculum to include HPV vaccination can help continue the program among youth. Thus, the researcher recommends the government and stakeholders to mobilize students for HPV immunization. Additionally, nurses should be taught to successfully provide HPV vaccines to adolescents.

However, the researcher proposes more research on how socio-economic factors and gender affect HPV vaccine uptake. Further research is needed to determine how parental decision and attitude affect HPV vaccine uptake in adolescents and young people.

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