ORIGINAL RESEARCH ARTICLE

Knowledge, attitude, and uptake of Human Papilloma Virus (HPV) vaccine among parents of adolescents attending outpatient clinic at the University of Benin Teaching Hospital, Nigeria

DOI: 10.29063/ajrh2023/v27i3.12

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Abstract

The aim of the study was to examine the knowledge, attitude and uptake of the Human Papilloma Virus (HPV) vaccine among 302 parents whose adolescents' children utilized care services at the General Practice Units (GPU) of the University of Benin Teaching Hospital (UBTH). Systematic sampling technique was used to select respondents for the study. Self-administered questionnaire that was pretested was used in collecting information from the respondents. The characteristics of the respondents were described using simple proportion and frequency. Also, knowledge and attitude of respondents on HPV and its vaccine were presented using simple proportion and frequency. The Chi-square test examined factors associated with uptake of HPV vaccine. The results indicate that 42.4% of the respondents have heard of HPV infection, whil only 18.5% have heard of HPV vaccine. By contrast, 18.5% of the respondents reported that their children had been vaccinated. Attitude of the respondents on the vaccine was not impressive given that only 34.4% reported that the vaccine was important, while 56.6% reported that they will advise their friends to be vaccinated. A higher proportion of children who were vaccinated were those whose parents believed that their children will be vulnerable without vaccination and those whose religion did not disapprove of the vaccination. We conclude that the knowledge of HPV among parents in this population is low; the knowledge of the vaccine and its uptake is low; while attitude towards the vaccine is unimpressive. We recommend the adoption of intervention programmes to improve the knowledge and encourage th uptake of the vaccine among adolescents in this population. *(Afr J Reprod Health 2023; 27 [3]: 108-117).*

Keywords: Human Papilloma Virus, adolescents, tertiary health facilities, Southern Nigeria

Résumé

L'objectif de l'étude est d'examiner les connaissances, l'attitude et l'adoption du vaccin contre le virus du papillome humain (VPH) chez 302 parents dont les enfants d'adolescents ont utilisé les services de soins des unités de médecine générale (GPU) de l'hôpital universitaire du Bénin (UBTH) . Une technique d'échantillonnage systématique a été utilisée pour sélectionner les répondants à l'étude. Un questionnaire auto-administré pré-testé a été utilisé pour recueillir les informations auprès des répondants. Les caractéristiques des répondants ont été décrites à l'aide d'une proportion et d'une fréquence simples. De plus, les connaissances et l'attitude des répondants sur le VPH et son vaccin ont été présentées en utilisant une proportion et une fréquence simples. Le test du chi carré a examiné les facteurs associés à l'adoption du vaccin contre le VPH. Selon le résultat, 42,4 % des personnes interrogées ont entendu parler de l'infection au VPH, 18,5 % ont entendu parler du vaccin contre le VPH. En outre, seuls 18,5 % des répondants ont déclaré que leurs enfants avaient été vaccinés. L'attitude des répondants sur le vaccin n'est pas impressionnante étant donné que seulement 34,4 % ont déclaré que le vaccin était important et 56,6 % ont révélé qu'ils conseilleraient à leurs amis de se faire vacciner. Une proportion plus élevée d'enfants vaccinés étaient ceux dont les parents pensaient que leurs enfants seraient vulnérables sans vaccination et ceux dont la religion ne désapprouvait pas la vaccination. En conclusion, la connaissance du VPH chez les parents est inférieure à la moyenne, la connaissance du vaccin et de son utilisation est faible et l'attitude n'est pas impressionnante. Enfin, un programme d'intervention doit être mis en œuvre dans la zone d'étude pour améliorer les connaissances et encourager l'adoption du vaccin chez les adolescents. *(Afr J Reprod Health 2023; 27 [3]: 108-117).*

Mots-clés: Virus du papillome humain, adolescents, établissements de santé tertiaires, sud du Nigéria

Introduction

'The global awareness of the Human Papilloma Virus (HPV) and the uptake of its vaccine among adolescents has been low especially among developing countries[1]. For instance, in Nigeria several studies have reported low level of knowledge of the virus and its vaccine among

parents and even their children[2-4]. However, the reverse has been the case among developed countries where knowledge and uptake of the vaccine has been reported to be high[5]. The HPV infection is an infection caused by HPV.[6] HPV is a deoxyribonucleic acid (DNA) virus from the Papilloma family, of which over 30 types of the 170 types known are sexually transmitted[7]. Majority of these infections resolve spontaneously without symptoms but some persist and cause warts or precancerous lesions with increased risk of Cancer of the mouth, throat, vulva, vagina, cervix, penis and anus[2,9]. It represents globally, an exceptional common viral sexually transmitted infection as up to 80% of sexually active individuals will acquire an HPV infection of some type at one point of their lives[3,10]. The World Health Organization (WHO) defines an adolescent as any person between ages 10 and 19[11]. There are three stages of the adolescents and they are early adolescents (10-13 years); middle adolescents (14-16 years) and late adolescents (17-19 years) [11-15]. It was affirmed that one in every five people in the world is an adolescent and by December 2018, global statistics showed that the world's population was 7.7 billion and of this, interestingly, there are 1.8 billion young people aged 10-24 years, representing 23.4% of the world's population[10].

Vaccination against HPV infection has been recognized as an effective primary intervention to prevent cervical, vaginal, and vulvar precancerous lesions in women and highly efficacious for preventing penile precancerous lesions and for reducing the burden of HPV-related diseases in men[7,16]. Two vaccines, a bivalent (HPV2) and a quadrivalent (HPV4) vaccine, are available and administered as a 3-dose series as routine vaccination[2]. In 2005, the experimental vaccine, Gardasil, by Merck and Company, Inc. was declared by its manufacturer to be 100% effective in prevention of sexually transmitted virus of HPV strains 16 and 18 in women; these strains together account for 70% of cervical cancers. The vaccine also proved to be 99% effective in preventing HPV strains 6, 11 which cause 90% of genital warts. [2] To prevent HPV associated infections, a prophylactic HPV vaccine was approved and licensed in 2006 and has been obtainable ever since targeting females aged 9 to 26 years[17-18].

In Nigeria, only a handful of studies examined the knowledge, attitude and uptake of HPV vaccine for adolescents among parents[2-4]. However, there is a dearth of research evidence on parental approval of the uptake of the vaccine by their children. Also, majority of the studies conducted in Nigeria considered only female child in terms of their uptake and parental approval of their uptake of the HPV vaccine. Therefore, there is a dearth of research evidence on male children uptake of the vaccine and parental approval of their uptake. It is noted in the literature that both male and female children are vulnerable to the virus. Against this backdrop, this study explored the knowledge, attitude of parents on the vaccination of their children including male and female against HPV and their rate of approval of the uptake of the vaccine.

Methods

Study setting

The study is a cross-sectional facility-based study conducted in University of Benin Teaching Hospital (UBTH) in Edo State, Nigeria. UBTH is a federal teaching hospital established in 1973 and it offers specialized care services. It is located at Ugbowo a few kilometers from the University of Benin. The General Practice Clinic (GPC) was used for the study because it is the Department where you can find large number of adolescents.

Sample size calculation

The study population comprise of all parents whose adolescents' children received care at the GPC of UBTH. A work through survey showed that on an average on daily basis, about 180 patients receive care at GPC of UBTH. Out of this, about 30 adolescents are seen in the clinic on a daily basis. The data for the study was obtained from 302 adolescents who received care at GPC of UBTH at the time of the study. The Cochrane's[19] sample size formula was used in estimating the sample size. Assuming an error margin of 5%, 1.96 critical value for 95% confidence interval and 77% rate of knowledge, attitude and uptake of HPV vaccination, which was reported in s study including 7 low-income countries (Bhutan, Bolivia, Cambodia, Cameroon, Haiti, Lesotho and Nepal)

using health facility approach[18].
The sample size is worked out below:

$$n = \frac{z^2pq}{d^2}$$

Where:
n= sample size
Z = critical values for 95% confidence interval (that is, 1.96)
P= probability of knowledge, attitude and uptake of HPV vaccination (that is 77%)
q=probability of lack of knowledge, attitude and uptake of HPV vaccination (that is, 23%)
d= error margin (that is, 0.05)

$$n= \frac{0.77\ x\ 0.23\ 1.96^2}{0.05^2}$$

$$n= \frac{0.77\ x\ 0.23x3.7828}{0.000025}$$

n = 272
Assuming a 10% non-response rate, the sample size was raised to 302.

Sampling and data collection

Data collection was carried out at the GPC family medicine departments of UBTH. The choice of the department is because it renders services to children and adolescent. Systematic sampling technique was engaged in selecting the respondents. The parent to the first adolescent that was registered in the department on the day of the study was selected, then the parent of every other fourth adolescent who registered was selected. In cases where a parent to an adolescent is selected and he/she declined, the parent to the next registered adolescent was selected and the order of selecting parent to every other fourth registered adolescent was maintained. Adolescent in the study was defined as those within 10-19 years. The inclusion criteria were parents whose child receive care at GPC, within the age group 10-19years and were willingly to participate. The exclusion criteria were parents whose child receive care at GPC, within the age grade 10-19 years but declined to participate in the study.

Outcome indicators

The outcome indicator for this study is Human Papilloma Virus (HPV) vaccination uptake. Human Papilloma Virus vaccination uptake was binary hence coded 1 for adolescents who reported they have taken Human Papilloma Virus vaccine and 0 otherwise.

Independent variables

Drawing from past studies[4,5,20,21], the following independent variables were explored as determinants of Human Papilloma Virus vaccine uptake; knowledge of Human Papilloma Virus vaccination, perception of importance of Human Papilloma Virus vaccination, societal permission, religious doctrine on Human Papilloma Virus vaccination, fear of contracting Human Papilloma Virus, beliefs and parental approval/disapproval.

Data collection procedure

The questionnaire used in eliciting information from the adolescents was self-administered. The questionnaire has various sections which includes Human Papilloma Virus infection, Human Papilloma Virus vaccine uptake and access to health information. The questions were mainly close-ended in which participants were provided with multiple responses[14]. The questionnaire was pretested by administering it to 30 volunteers from Oredo L.G.A. at Central hospital, Benin City who do not receive care at GPC, UBTH. At two weeks' interval the questionnaire was administered to the same set of persons and the Alpha Cronbach was used to estimate the scale reliability coefficient, which was 0.85 showing that the questions were internally consistent. The questionnaire was administered with the assistance of two medical doctors who were recruited and given two days of training on field conducts and in-depth review of contents in the questionnaire. No major changes were made after the pre-testing phase was completed The questionnaire was administered through face-to-face contact and was fielded in English language. Once the activity is completed, each respondent received an information pamphlet on HPV vaccine. The collection of data lasted from May 5th, 2020 to August 8th, 2020.

Statistical analysis

The data obtained through questionnaire were cleaned, recoded where necessary and then entered into excel spreadsheet, then analyzed with SPSS version 22.0. Descriptive statistics was used to indicate the demographic characteristics as well as the level of knowledge. Chi-square test was used to

assess factors associated with uptake of HPV vaccine. Statistical significance was set at 5%.

Ethical considerations

Approval to conduct the study was obtained from the Research Ethics committee of the University of Benin. Approval to conduct the study in UBTH was gotten from the hospital authority. Informed consent was obtained from the respondents. Respondents were giving the free will to participate or not. No withdrawal penalty from any respondents who wish to withdraw from the study. In this study confidentiality and privacy of personal information shared by the study respondents with the researcher were maintained during the entire study period. After each interview, the completed questionnaires were separated from the consent forms and safely kept to avoid unauthorized access to the information that was obtained. However, all the data collected was processed without names or other kind of information that are recognizable.

Results

Background characteristics of respondents

In Table 1, we present the socio-demographic characteristics of the respondents. The Mean age of the children to responding parents was 14.0 years with Standard Deviation of 2.9 years. The highest proportion of the children whose parents responded to the questionnaire was (10-13) years (44.7%), while the lowest proportion was within the age grade (17-19) years (24.5%). Approximately 38% of the parents were male, while 62% were female. Of all the parents who reported, 272 (90.1%) were single, 30 (9.9%) were cohabiting while none was married. Christians parents were 266 (88.1%) while Muslims were 36 (11.9%) but none indicated African Traditional Religion. Primary level of education was 127 (42.1%) among respondent parents, 22 (7.3%) secondary level, 153 (50.7%) tertiary level of education and none of the respondents had no formal education. The data also showed that 242 (80.1%) of parents who responded were unemployed whereas 60 (19.9%) were employed. Furthermore, it is estimated that 133 (44.0%) were Bini; 38 (12.6%) Esan; 34 (11.3%) Hausa; 32 (10.6%) Afemai; 21 (7.0%) Akoko-Edo; 16 (5.3%) Yoruba; 15 (5.0%) Igbo and 13 (4.3%) of respondents indicated their ethnicity as 'others'.

Table 1: Socio-demographic characteristics of respondents

Socio-demographic characteristics	Frequency (n=302)	%
Age of child (years)		
Mean (SD)	14.0(2.9)	
13-15	135	44.7
14-16	93	30.8
17-19	74	24.5
Gender:		
Male	116	38.4
Female	186	61.6
Marital Status:		
Single	272	90.1
Cohabiting	30	9.9
Religious Orientation:		
Christianity	266	88.1
Islam	36	11.9
Educational Status:		
No formal education	0	0.0
Primary	153	50.7
Secondary	127	42.1
Tertiary	22	7.3
Occupation:		
Unemployed	242	80.1
Employed	60	19.9
Ethnic Group:		
Bini	133	44
Esan	38	12.6
Afemai	32	10.6
Akoko-Edo	21	7.0
Yoruba	16	5.3
Igbo	15	5.0
Hausa	34	11.3
Others	13	4.3

*Others include Urhobo 7 (2.3%), Tiv 3(1.0%), Ibibio 2 (0.7%), Igede 1 (0.3%)

In Table 2, we present result on knowledge and perception of HPV infection among the selected respondents. According to the data, 128 (42.4%) of respondents have heard of HPV whereas 174 (57.6%) have not. Among those who reported they have heard, 100 (78.1 %) heard from health professionals, 13 (10.2 %) from media, 12 (9.4 %) from families and friends and 3 (2.3%) from medical and health-related institution. Of all the respondents, 104 (34.4%) thought their awareness on HPV is adequate and 198(65.6%) thought it is not. Also, 155 (51.3%) of respondents thought HPV affects both male and female while 147 (48.7%) disagreed that it can affect both male and female.

Table 2: Knowledge and perception of HPV infection and prevention

Variables	Frequency (n=302)	%
Have you heard of HPV infection?		
Yes	128	42.4
No	174	57.6
Source of Information for HPV:		
Health professional	100	78.1
Media	13	10.2
Health related institution	3	2.3
Friends and Family	12	9.4
Your awareness of HPV is adequate:		
Yes	104	34.4
No	198	65.6
Does HPV affects both male and female?		
Yes	155	51.3
No	147	48.7
Do You Know the Symptoms of HPV infection?		
Yes	162	53.6
No	140	46.4
What means are HPV transmitted?		
Sexual Intercourse	206	68.2
Blood contact	96	31.8
By what means do you prevent HPV?		
Abstinence	42	13.9
Avoidance of blood contact	66	21.9
Protected sexual intercourse	194	64.2
Do you approve that your child take HPV vaccine?		
No	149	49.3
Yes	153	50.7

Table 3: Knowledge and attitude towards HPV vaccination among adolescents

Variables	Frequency(n=302)	%
Have you heard of HPV Vaccination?		
Yes	56	18.5
No	246	81.5
Stages attained:		
Initiation	227	75.0
Completion	75	25.0
Is HPV Vaccine uptake very important ?		
Yes	104	34.4
No	198	65.6
Will you advise friends or relative to be vaccinated ?		
Yes	171	56.6
No	131	43.4
Do you think society permits you to be vaccinated?		43.4
Yes	246	81.5
No	56	18.5
Does your religion preach about HPV Vaccine ?		
Yes	**91**	**30.1**
No	**211**	**69.9**
Will your religion permit you to have vaccination?		
Yes	**199**	**65.9**
No	**103**	**34.1**
Do you believe your chances of contracting HPV is high without vaccination?		
Yes	**184**	**60.9**
No	**118**	**39.1**
My belief forbids me from getting the vaccine ?		
Yes	**183**	**60.6**
No	**119**	**39.4**

Table 4: Association of Attitude towards HPV vaccination among adolescents and uptake of HPV vaccine - number (%)

	Uptake of Vaccine			
Variables	**No(246)**	**Yes(56)**	**Chi-Square**	**P-value**
Do you think HPV Vaccine uptake is very important ?				
Yes	82(33.3)	22 (39.3)	0.716	0.398
No	164(66.7)	34(60.7)		
Will you advise friends or relatives to be vaccinated ?				
Yes	135(54.9)	36 (64.3)	1.644	0.200
No	111(45.1)	20 (35.7)		
Do you think society permit you to be vaccinated?				
Yes	201(81.7)	45 (80.4)	0.055	0.814
No	45(18.3)	11(19.6)		
Does your religion permit you to have vaccination?				
Yes	70(28.5)	21(37.5)	1.773	0.183*
No	176(71.5)	35(62.5)		
I think my chance of contracting HPV vaccine is high without vaccination?				
Yes	159(64.6)	40(71.4)	0.937	0.333
No	87(35.4)	16(28.6)		
Getting HPV vaccine would go against my belief:				
Yes	141(57.3)	42(75.0)	4.36	0.037*
No	105(42.7)	14(25.0)		

*Variables that are statistically significant at 20%.
The values in parenthesis are the proportion

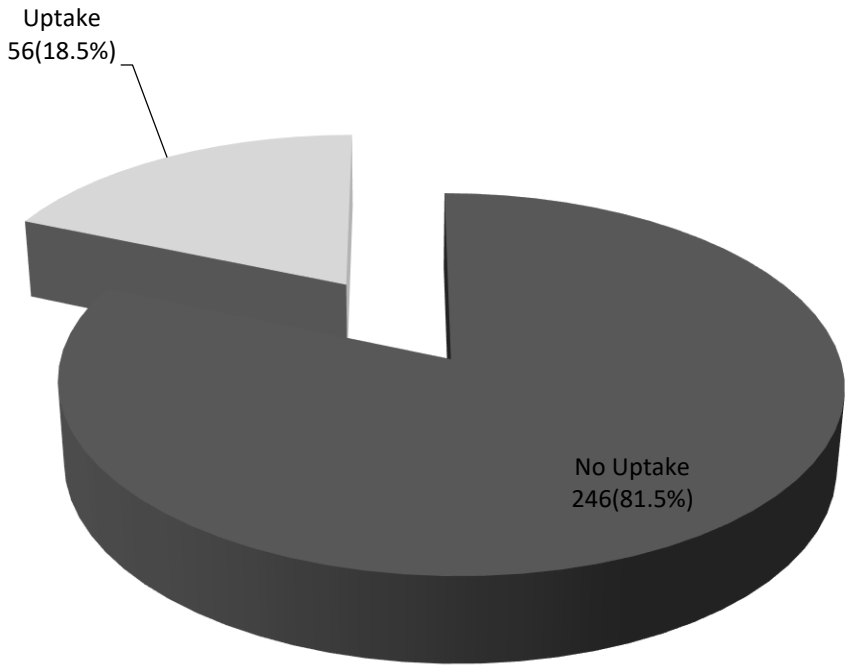

Figure 1: The Uptake of HPV vaccine among adolescents

Again, 162 (53.6%) were aware of symptoms of HPV infection while 140 (46.4%) were not aware of the symptom. Furthermore, 206 (68.2%) of respondents said HPV is sexually transmitted while 96 (31.8%) said it is transmitted through blood contact. Also, 193 (64.2%) reported that HPV can be prevented through protected sexual intercourse; 66 (21.9%) reported prevention through blood contact; and 42(13.9%) by sexual abstinence. 184 (60.9%) agreed that their chance of contracting HPV is high without HPV vaccine while 118 (39.1%) disagreed. Also, 183(60.6%) reported that use of HPV vaccine is against their beliefs, while 119 (39.4%) did not give such report. While 149 (49.3%) of the parents approved the vaccine for their children, 153 (50.7 %) disapproved of the vaccine.

Knowledge and attitude towards HPV Vaccination

In Table 3, the present result on knowledge and attitude of responding parents on HPV vaccination is presented. According to the result, 246 (81.5%) have not heard of HPV vaccination whereas 56 (18.5%) have heard about it. Of the 56 that have heard of HPV vaccination, 42 (75.0%) were in the initiation phase while 14 (25.0%) were in the completion phase of the vaccine. Also, 104 (34.4%) thought HPV vaccine uptake is very important while 198 (65.6%) had a contrary opinion. 171 (56.6%) were willing to advise friends or relatives to be vaccinated whereas 131(43.4%) were not. Also, 246 (81.5%) reported societal approval for vaccine uptake, while 56 (18.5%) reported otherwise. Furthermore, 91 (30.1%) respondents (30.1%) said their religion preaches about HPV vaccine while 211 (69.9%) of the them reported that their religion did not preach about HPV. However, majority 199 (65.9%) reported that their religion approved the uptake of the vaccine, while 103 (34.1 %) had their religion disapproved of it.

Factors associated with uptake of HPV Vaccine

Overall uptake of HPV vaccine as shown in Figure 1 and Table 4 showed that 56 (18.5%) of parents reported that their children had taken HPV vaccine while 246 (81.5%) reported that their children had not. The chi-square test result presented in Table 4 showed us that only two variables were significant at 20 per cent significant level. They are the approval of one's religion to get vaccinated and perception of whether vaccination reduces riskiness or not. For instance, while 62.5 per cent of children whose parents' religion did not disapprove vaccination actually got vaccinated only 37.5 per cent of those whose parents' religion disapproved the vaccine got vaccinated. Also, while 73.2 of children whose parents thought they were likely to be vulnerable without vaccination undertook the vaccine, only 26.8 per cent of those who those whose parents did not have such thought took the vaccine.

Discussion

The study examined the knowledge and attitude of parents of 302 adolescents who used health care services in GPC of the UBTH on HPV vaccine. The objective was to find out the knowledge, attitude and willingness of parents to accept the vaccination of their children against HPV. Nigeria has one of the highest incidence of cervical cancer globally[4]. A study conducted among Nigeria, Ghana and South Africa found out that HPV types 16 and 18 was found among 68.4 per cent of women with cervical cancer[2]. This suggests that HPV vaccine could play positive role in reducing the spate of cervical cancer among Nigerian women[20].

The results revealed that 42.4 per cent of the parents included in the study have heard of HPV infection showing sub-optimal level of knowledge. A study conducted among school girls in two local Government Areas (LGAs) in Lagos state revealed that 29.6 per cent of participants had knowledge of HPV infections, which is considered low.22 Contrary to the result in this study, other studies conducted among developing countries reported high knowledge of HPV infections among study participants[5,23]. The result showed that majority of the respondents had poor knowledge of the HPV vaccine. Several other studies conducted across developing countries revealed low rate of knowledge of HPV vaccine among participants[2].

The poor knowledge of the vaccine among participants in this study showed that very little has been done to create awareness of the vaccine, implying that efforts need to be put in propagating

information of the availability of HPV vaccine. Health promotions efforts deploying educational approach can be used to disseminate information on HPV vaccine. It is suggested that awareness campaign should be launched among Primary Healthcare Centers (PHCs) in Nigeria, and the choice of PHCs is due to its wide coverage and proximity to many people[22]. In the light of the burden of cervical cancer in Nigeria, creation of awareness of HPV vaccine is considered the right action. Despite the low knowledge of the vaccine among parents in this study, more than half of the respondents (50.7 per cent) were willing and gave their approval that their children should be vaccinated. However, only 18.5 per cent had already been vaccinated showing underutilization among the participants.

The rate of approval for child immunization reported in this study is far below what was reported in several other studies. For instance, 88.6 per cent of the mothers in a study conducted in Ibadan, South Western Nigeria approved that their children should be vaccinated[3]. In another study conducted in Abakiliki South Western Nigeria, 89.1 per cent of mothers approved that their children should be vaccinated[6].

The result from the Chi-square tests showed that two factors influence the decision of parents to approve their child to undertake HPV vaccine. The factors are the approval by parent's religion to take the vaccine and the belief which parents have that non utilization of the vaccine will increase the vulnerability of the child to the virus. A large proportion of parents who believed that their child will be susceptible to the virus without vaccination and those who worship in religion that does not disapprove the vaccination had their child took the vaccine. The insight from this study is that religion has influence on the uptake of HPV vaccine by adolescents, and this is because religion holds one of the greatest influence on the society[7]. There is, therefore, a need for religious leaders to emphasize the importance of HPV vaccination in their various meetings.

Limitations

Despite the utility from the result of this study it has some noteworthy limitations. First, the data analyzed in this study was gotten through verbal reporting, as such was not subjected to any form of validation such as the use of vaccination cards. Second, there is possibility that respondents gave socially-desirable responses. Despite these limitations, the study added to the few studies that examine knowledge, attitude and awareness of HPV virus and vaccine among adolescents in Africa. Most studies were conducted in Western countries with fewer studies from Asia and Africa. Many of such focused more on the female gender than the male thus limiting comparison.

Conclusion and Recommendations

HPV vaccine uptake is very low from the findings in this study. The result showed that adolescents had limited awareness and knowledge of HPV infections and vaccines. Knowledge of HPV and vaccine is a significant factor in HPV vaccine uptake. It is recommended that barriers to uptake of the vaccine should be addressed, and that school-based as well as health facility based sexual health education of HPV infections and HPV vaccine be encouraged. HPV vaccination is a very useful preventive tool in HPV infections and its sequele. HPV vaccine though not recently introduced nor approved in Nigeria, is yet to be incorporated in the routine childhood immunization schedule which would have improved its uptake hence the low uptake in this study. Though not acceptable, it underscores the need for improved information, education and communication among adolescents and their parents in Nigeria. The Federal Government, Adolescents, parents and healthcare professionals therefore have a major role to play in HPV vaccine uptake.

Funding

The study has no funding to report.

Availability of data and materials

The dataset used and analyzed during the current study is available from the corresponding author on a reasonable request**.**

Conflict of interest

The author declared no conflicts of interests.

Acknowledgements

The authors wish to appreciate all the research assistants who helped in gathering the data.

Contributions of authors

O.T.E contributed to the conceptualization, review of literature, initial manuscript preparation, study design, data analysis, wrote the results, and discussed the findings. O.T.E read and approved the final draft.

References

1. Bonanni P, Bechini A, Donato R, Capei R, Sacco C, Levi M and Boccalini S. Human papilloma virus vaccination: impact and recommendations across the world. Therapeutic advances in vaccines. 2015; 3(1):3-12.
2. Denny L, Adewole I, Arnold R, Dreyer G, Moodley M, Smith T, Snyman L, Wiredu E, Molijn A, Quint W and Ramakrishna G. Human papillomavirus prevalence and type distribution in invasive cervical cancer in sub-Saharan Africa. International journal of cancer. 2014;134(6):1389-98.
3. Morhason-Bello IO, Wallis S, Adedokun BO and Adewole IF. Willingness of reproductive- aged women in a Nigerian community to accept human papillomavirus vaccination for their children. Journal of Obstetrics and Gynecology research. 2015; 41(10):1621-9.
4. Rabiu KA, Alausa TG, Akinlusi FM, Davies NO, Shittu KA and Akinola OI. Parental acceptance of human papillomavirus vaccination for adolescent girls in Lagos, Nigeria. Journal of Family Medicine and Primary Care. 2020; 9(6):2950-3000.
5.Borena W, Luckner-Hornischer A, Katzgraber F and Holm-von Laer D. Factors affecting HPV vaccine acceptance in west Austria: Do we need to revise the current immunization scheme. Papillomavirus Research. 2016 1(2):173-7.
6. Azuogu BN, Umeokonkwo CD, Azuogu VC, Onwe OE, Okedo-Alex IN and Egbuji CC. Appraisal of willingness to vaccinate daughters with human papilloma virus vaccine and cervical cancer screening uptake among mothers of adolescent students in Abakaliki, Nigeria. Nigerian journal of clinical practice. 2019 ;22(9):1286-1291.
7.Garland SM, Steben M and Sings HL. Natural history of genital warts: analysis of the placebo arm of 2 randomized phase III trials of a quadrivalent human papillomavirus (types 6, 11, 16, and 18) vaccine. *The Journal of infectious diseases.* 2009; 199(6):805-814.
8.Roden R and Stern PL. Opportunities and challenges for human papillomavirus vaccination in cancer. Nature Reviews Cancer. 2018;18(4):240-54.
9. Li Y and Xu C. Human papillomavirus-related cancers. Infectious agents associated cancers: Epidemiology and molecular biology. 2017; 7(8):23-34.
10. Jessica F, Lynne T, Patricia K and Ian, F. Parent and Adolescent Knowledge of HPV and Subsequent Vaccination. Pediatrics. 2014, 134(4):1-18.
11. Ross DA, Hinton R, Melles-Brewer M, Engel D, Zeck W, Fagan L, Herat J, Phaladi G, Imbago-Jácome D, Anyona P and Sanchez A. Adolescent well-being: A definition and conceptual framework. Journal of Adolescent Health. 2020;67(4):472-6.
12. Rashid S, Labani S and Das CB. Knowledge, Awareness and Attitude on HPV, HPV Vaccine and Cervical Cancer among the College Students in India. PLoS One. 2016; 11(11): e0166713.
13. Zouheir Y, Daouam S, Hamdi S, Alaoui A and Fechtali T. Knowledge of human papillomavirus and acceptability to vaccinate in adolescents and young adults of the Moroccan population. J PediatrAdolesc Gynecol. 2016;29(3):292-8.
14. Ahuru RR. Maternal care utilization in primary healthcare centers in Nigerian communities. International Quarterly of Community Health Education. 2022; 2(1):1-19.
15.National Population Census projection, 2016 www.ncbi.nlm.nih.gov/pmc.
16. De Groot AS, Tounkara K, Rochas M, Beseme and Yekta S. Knowledge, attitudes, practices and willingness to vaccinate in preparation for the introduction of HPV vaccines in Bamako, Mali. PloS One. 2017; 12(2): e0171631.
17.Okunade K, Sunmonu O, Osanyin G and Oluwole AA. Knowledge and Acceptability of Human Papillomavirus Vaccination among Women Attending the Gynecological Outpatient Clinics of a University Teaching Hospital in Lagos, Nigeria. Journal of Tropical Medicine. 2017; 2(3):1-16
18.*Markowitz LE, Dunne EF and Saraiya M. Human Papillomavirus Vaccination: Recommendations of the Advisory Committee on Immunization Practices (ACIP). Morbidity and Mortality Weekly Report. 2014; 63(RR05): 1-30.*
19. Chocrane, WG. Sampling technique. 3rd edn. New York: John Wiley and Sons, 1977.
20. López N, Salamanca de la CI, Vergés E, Suarez VE, Sánchez A, López AB, Piezo-Santos MB, Garcés-Sánchez M, Montesdeoca A, Rivera AJ and Cotarelo MS. Factors influencing HPV knowledge and vaccine acceptability in parents of adolescent children: results from a survey-based study (KAPPAS study). Human Vaccines & Immunotherapeutic. 2022;18(1): 9-18.
21. Beyen MW, Bulto GA, Chaka EE, Debelo BT, Roga EY, Wakgari N, Dania KT and Fekene DB. Human papillomavirus vaccination uptake and its associated factors among adolescent school girls in Ambo town, Oromia region, Ethiopia, 2020. PloS one. 2022; 13;17(7): e0271237.

22. Ojimah C and Madurai O. Awareness and uptake of human papillomavirus vaccines among female undergraduate students: Implications for cervical cancer prevention in South- South, Nigeria. Port Harcourt Med J. 2017; 11:134-40.
23. Hoque ME, Ghuman S and Hal GV. Human papillomavirus vaccination acceptability among female university students in South Africa. Asian Pac J Cancer Prev. 2013;14 (5):4865-9.
24. Azuogu BN, Umeokonkwo CD, Azuogu VC, Onwe OE, Okedo-Alex IN and Egbuji CC. Appraisal of willingness to vaccinate daughters with human papilloma virus vaccine and cervical cancer screening uptake among mothers of adolescent students in Abakaliki, Nigeria. Nigerian journal of clinical practice. 2019 ;22(9):1286-1291.