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Research Article

Perception, Acceptance and Uptake of Human Papillomavirus Vaccine among Female Adolescents in Selected Secondary Schools in Ibadan, Nigeria

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ABSTRACT

Infection with Human papillomavirus (HPV) contributes to malignant changes in the cervix leading to cancer mortality among women. HPV vaccine is now available for its prevention, yet the level of uptake is low. The study aimed at determining Perception, Acceptance and Uptake of Human papillomavirus Vaccine among female adolescents in selected secondary schools in Ibadan, Nigeria. This cross-sectional study was conducted among 296 female adolescent senior secondary school students in Ibadan, Nigeria. Respondents were selected using purposive sampling method and data were collected using self-administered questionnaire. The data were analysed using the Statistical Package for Social Sciences version 20.0. Variables were presented as frequency tables and hypotheses were tested using chi-square and Fisher's exact test at $P \leq 0.05$. Most 142(48.0%) of the respondents were between ages 15-17. The respondents' perception and knowledge about HPV vaccine, HPV infection and cervical cancer was generally poor. Furthermore, only 12(4.1%) of the respondents have received the HPV vaccine before the study. There is a significant association between adolescent's perception and uptake of HPV vaccine p=0.000 as well as Perception and readiness for the use of HPV vaccine (p=0.007). Parental approval and readiness for HPV vaccine uptake were found to be significantly associated (p =0.000). Since knowledge about Human Papilloma Virus Vaccination is quite low, there is need to increase awareness about the Vaccination among female adolescents and their mothers. Also, peer educators in schools can be trained to improve awareness in schools so as to reduce the incidence of cervical cancer.

Keywords: Perception, Acceptance, Use, Human Papilloma Vaccine, Female Adolescent

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INTRODUCTION

Human papillomavirus (HPV) infection is one of common sexually transmitted disease worldwide. Approximately half of the sexually active men and women are estimated to have HPV infection at one time during their lifetime (Nandwani, 2010; Romo, *et al*., 2011). Contracting HPV is considered the greatest risk factor for developing cervical cancer (Hutchinson *et al*., 2008; World Health Organization, 2016; Bruni, *et al*., 2017). HPV infections usually clear within a few months, and about 90% clear within two years but a small proportion of infections persists and can progress to cervical cancer (World Health Organization [WHO], 2014). Cervical cancer has substantial mortality worldwide, There were an estimated 266,000 deaths from cervical cancer worldwide in 2012, accounting for 7.5% of all female cancer deaths. (International Agency for Research on Cancer, GLOBOCAN, WHO/ICO Information Centre, 2012). Vaccines prevent 70% of cervical cancers, as well as HPV-16 and HPV-18, the 2 HPV strains that account for most cervical cancer cases worldwide (Wang *et al*., 2013).

Primary protection against HPV includes elimination of the sexual risk factors and prophylactic vaccination (Nandwani, 2010). HPV vaccines should be administered before a young person has had any type of sexual contact with another person (Arbyn, *et al*., 2007). WHO (2013) recommends routine vaccination of girls 9-13 years of age because they are not as likely to have begun sexual activity. Ensuring universal access to HPV vaccination, screening and treatment services will be key to reducing the burden of cervical cancer worldwide (PATH, 2010). The Human Papillomavirus (HPV) vaccine has the potential to greatly reduce the incidence of cervical cancer by protecting against HPV infections (Mather, *et al*., 2012). The vaccines provide

little benefit to women having already been infected with HPV types 16 and 18 (CDC, 2013).

Levels of knowledge of cervical cancer and HPV as well vaccination uptake were consistently low in various countries, Nigeria inclusive (Perlman, *et al*. 2014; Iliyasu, *et al*., 2010). Human Papilloma Virus Vaccinations still lags behind other vaccination types both in developed and developing countries. Kilic, *et al*.(2012) reported that it was as low as 43.5% among Turkish adolescent girls. Centre for Disease Control (2014) stated that HPV Vaccination uptake in the United States showed that 60% for adolescent girls and 42% adolescent boys have received one or more doses of HPV vaccine; In Los Angelis only 25% of College students had initiated the vaccine in 2012 (Marchand, *et al*., 2012). Also low in Denmark where only 24% of young women were found to have received vaccination against HPV (Mortensen, 2010).

However, interest in obtaining HPV vaccines has been reported among adolescents and young females in many countries worldwide yet uptake has remained low (Gerend *et al*., 2013; Iliyasu, *et al*., 2010). There are various barriers to uptake of HPV Vaccination uptake which include: worries about side effects and infertility Watson-Jones *et al*. (2012), safety concerns, a low perceived severity of HPV and a lack of school order Perkins *et al*. (2012), the adolescents' anxieties about needles and needle cleanliness, anticipated pain on injection and privacy during vaccination (Hilton *et al*., 2011) vaccine availability (Constantine *et al*., 2007), parental beliefs and attitudes (Dempsey *et al*, 2006).

Adolescents' perceptions of HPV vaccine and cervical cancer remain open to debate. Understanding female adolescents' acceptance of HPV vaccine is important as it is not well documented across secondary schools in Nigeria. Since adolescents are within the target age group for HPV vaccination there is need to determine their perception and readiness for this vaccination and document the level of use. The main objective of the study was to evaluate Perception, Acceptance and Uptake of Human Papillomavirus Vaccine among Female Adolescents in Selected Secondary Schools in Ibadan, Nigeria as well as influencing factors

MATERIALS AND METHODS

Study design: a descriptive cross-sectional study.

Study Setting: The study area is Ibadan North Local Government Area in Oyo State, Nigeria. The Local Government Area also houses several health care centers such as University College Hospital, Jaja Health Care Centers, Adeoyo Maternity-Hospital, Primary Health Care Centres and several Private Hospitals. The selected schools include Immanuel Grammar school Ibadan, International School Ibadan and Abadina College Ibadan.

Study population: comprised of female adolescents in selected secondary schools in Ibadan. Immanuel Grammar school Ibadan -132, International School Ibadan- 417 and Abadina College Ibadan-451. The total population of female students in the three selected schools was 1000.

Sample Size Determination: The sample size was calculated using Araoye (2004) formula to derive 296 respondents.

Sampling technique: Purposive sampling was used for the selection of the female adolescent students across the selected secondary schools from Senior Secondary School (SSS) 1 to 3 from ages 12 to 19 years. They were purposely selected because they were within the age group expected to have recently taken HPV vaccination

Research Instrument: A self-administered questionnaire was used for the study. It had five sections which consisted of Socio demographic data, perception about human papilloma virus (HPV) vaccine and cervical cancer, adolescent attitude towards human papilloma virus vaccine, use of HPV vaccine among female adolescents and factors influencing the use of HPV among female adolescents.

Procedure for data collection: Data was collected using self-administered questionnaire after obtaining ethical approval and necessary permission from the school authority. Full explanation about the study was given to the respondents. Respondents' consent was gained before administration of the questionnaires. The questionnaire was filled and retrieved immediately in their classrooms during break time.

Method of data analysis: Data generated for the study were sorted and analysed using IBM statistical package for the Social Sciences (SPSS) version 20. Descriptive statistical method such as percentage distribution was used for analysis. Data was presented in figures, frequency tables and percentages. Hypotheses were tested using Chi square test at $P \leq 0.05$

RESULTS

Sociodemographic characteristics

Table 1 revealed that many of the respondents 142(48.0%) were between ages 15-17, 104(35.1%) were in SS2, 127(42.9%) were in Science students. Most of them 236(79.7%) were of Yoruba Ethnic group, 203(68.6%) were Christians. Also, 205(69.3%) received weekly allowance from their parents. Up to, 245 (82.8%) of the respondents own a mobile phone and 224(75.7%) make use of social media.

Awareness and Perception on Human Papillomavirus

Figure 1 revealed that majority of the respondents 261(88.2%) have never heard of HPV but 163(55.1%) of the respondents had heard about cervical cancer. Table 2 revealed that respondents got their information on HPV mainly from internet 34.3%, while 20% respectively heard from books and media. Least sources of information being mothers (8.6%) and Teachers (5.7%).

Table 3 showed that over 70.4% of the respondents did not know that the HPV vaccination can prevent cervical cancer; also 74% did not know if HPV is the main cause of cervical cancer. Most of the respondents did not know the right answers to most of the questions on HPV and cervical cancer.

Figure 2 shows the respondents' perception categories, as most of the respondents 199 (67%) had poor perception while 33% had good perception.

Table 4 revealed that 89(30.1%) were of the opinion that if they feel at risk of getting HPV, they will take the vaccine, Other findings showed that 93(31.4%) of the respondents were of the opinion that being infected with HPV is very deadly and can lead to death, 115(38.9%) of the respondents think that by taking the vaccine, they will be safe and healthy, 89(30.1%) said yes their parents must be the one to decide for them. Over 50% of the respondents were undecided on most of the items.

HPV Vaccination uptake

Table 5 indicates that 246(83.1%) of the respondents had not received an HPV vaccine before, while only 12(4.1%) had received HPV vaccine before. Up to 204(68.9%) of the respondents stated that no one in their family had received the HPV vaccine and 210(70.9%) stated that none of their friends had received the HPV vaccine. 121(40.9%) of the respondents are willing to receive the vaccine.

Table 6 on the predictors of HPV vaccination shows that 143(48.3%) of the respondents are of the view that their parents approval is important before they can receive the HPV vaccination. They were not sure of others as 64(55.4%) did not know if their religious beliefs will encourage them to receive the HPV vaccination;147(49.7%) did not know if it is against their cultural beliefs; 156(52.7) did not know if their ethnic background does not approve of the HPV vaccination; 154(52.0) didn't know if getting support from their family members will encourage them to take the HPV vaccination. The findings shows that 254(85.8%) of the respondents did not know where to go for the HPV vaccine.

Table 1

Socio-Demographic characteristics of the respondent

Sociodemographic Variables	Frequency (n=296)	Percentage (%)
Age		
10-14 years	130	43.9
15-17 years	142	48.0
18-19 years	58	16.1
Tribe		
Yoruba	234	79.7
Igbo	32	10.8
Hausa	4	1.4
Others	24	8.1
Religion		
Christianity	203	68.6
Islam	90	30.4
Others	3	1.0
Weekly allowance		
No	80	27.0
Yes	216	73.0
Ownership of mobile phone		
No	53	17.2
Yes	245	82.8
Use of social media		
No	72	24.3
Yes	224	75.7

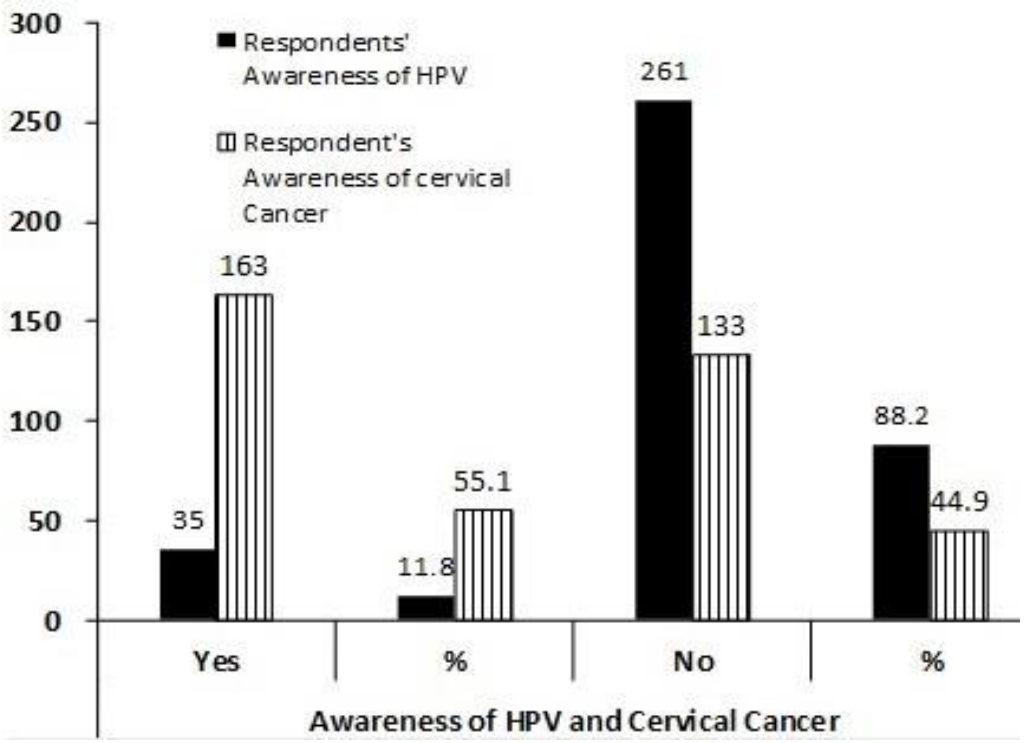

Figure 1

Respondents' Awareness of HPV and Cervical cancer

Table 2:
Sources of the information on HPV

Source of information on HPV	Frequency	Percentage
Media	7	20.0
Internet	12	34.3
Mother and family member	3	8.6
Friends	4	11.4
Books and magazines	7	20.0
Teacher	2	5.7
Total	**35**	**100**

Table 3:
Respondents' perception about HPV vaccine and cervical cancer

Perceptions	**Yes**	**No**	**Don't know**
The HPV vaccination can prevent cervical cancer	68 (23.0)	19 (6.4)	209 (70.4)
HPV is the main cause of cervical cancer	43 (14.5)	34 (11.5)	219 (74)
Cervical cancer is a sexually transmitted disease	48 (16.2)	71 (24.0)	177 (59.8)
The HPV vaccine increases the occurrence of cervical cancer	28 (9.5)	43 (14.5)	225 (76)
HPV vaccine prevents against contacting genital warts	59 (19.9)	26 (8.8)	211 (71.3)
HPV is the main cause of genital warts	42 (14.2)	27 (9.1)	227 (76.7)
HPV is transmitted sexually	40 (13.5)	35 (11.8)	221 (74.6)
Having multiple sex partners reduces risk of HPV infection	35 (11.8)	57 (19.3)	206 (68.8)
Sex at an early age increases risk of HPV infection	72 (24.3)	26 (8.8)	198 (66.9)
HPV infection can easily be noticed	44 (14.9)	35 (11.8)	217 (73.3)
HPV can survive for a long time within the body	45 (15.2)	27 (9.1)	224 (75.7)
The virus can clear from the body without treatment in some individuals	36 (12.2)	46 (15.5)	214 (72.3)

Association between variables

Table 7 indicates that there is a significant association between Perception about vaccine and uptake (Fisher test = 0.000). Also, there is a significant association between adolescent's perception of HPV vaccinations and readiness to accept HPV vaccine, X^2= 6.825, p-value= 0.007. Furthermore, there is a significant association between parental approvals and readiness to accept HPV vaccine X^2 = 31.66, p-value= 0.000

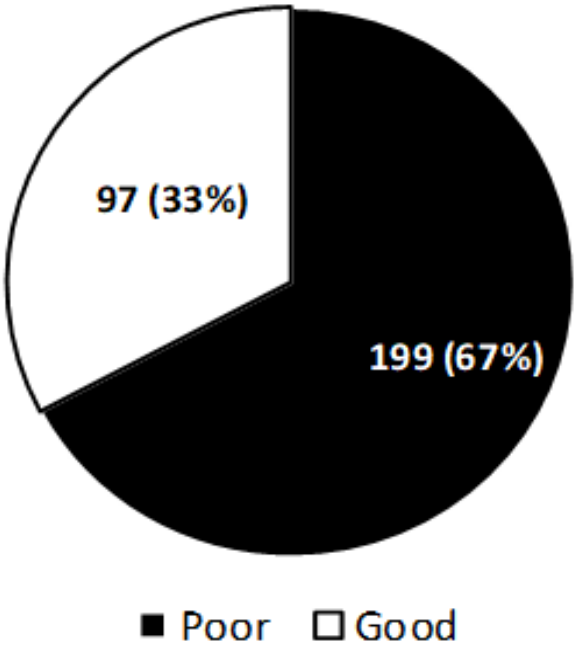

Figure 2:
Respondents' Perception about HPV Vaccination

Table 4
Adolescents' attitude towards human papilloma virus vaccine

Attitude toward HPV Vaccine	**AGR**	**DSGR**	**UND**
Because I feel at risk of getting HPV, I will take the vaccine	89 (30.1)	42 (14.2)	165 (55.7)
I feel being infected with HPV is very deadly and can lead to death	93 (31.4)	36 (12.2)	167 (55.4)
I think taking the vaccine will keep me safe and healthy	115 (38.9)	25 (8.4)	156 (52.7)
My parents must be the ones to decide whether I take the HPV vaccine or not	89 (30.1)	55 (18.6)	152 (51.3)
The cost of the vaccine discourages me	32 (10.8)	88 (29.7)	176 (59.5)
The safety of the vaccine encourages me	39 (13.2)	75 (25.3)	182 (61.5)
I will use the HPV vaccine if its available in the clinics to students free	94 (31.8)	34 (11.5)	168 (56.7)
I feel embarrassed to get an HPV vaccination	31 (10.4)	94 (31.8)	171 (57.8)
I don't know much about the vaccine so will not take it	63 (21.3)	65 (22.0)	168 (56.7)

Key: AGR – Agree; DAGR- Disagree; UND- Undecided

Table 5:
Respondents' Acceptance and Uptake of HPV vaccine

Acceptance and Uptake of HPV Vaccine	Yes	No	Don't Know
Willing to accept the HPV vaccine	121 (40.9)	118 (39.9)	57 (19.2)
Will Accept HPV vaccination as often as required	118 (39.9)	117 (39.5)	61 (20.6)
Ever received HPV Vaccine (Uptake)	12 (4.1)	246 (83.1)	38 (12.8)
Received any counselling or information on HPV	9 (75)	3 (25)	-
Family member ever received the HPV vaccine	24 (8.1)	204 (68.9)	68 (23)
Friends ever received HPV vaccine	23 (7.8)	210 (70.9)	63 (21.2)

DISCUSSION

This study focused on the perception, acceptance and use of human papillomavirus vaccine among female adolescents in selected secondary schools in Ibadan. The respondents were between ages 15 to 17 years, in senior secondary school 2(SSS2), from Yoruba ethnic group and Christians by religion. This can be attributed to the fact that this study was conducted in Oyo state, which is one of the six Yoruba speaking states of south west Nigeria. Most of them were depended on parents for weekly allowances, over 80% of them own a mobile phone, 75% make use of social media. This shows they are functioning within the current global trends.

Table 6:
Possible influences on HPV vaccine uptake among female adolescents

Influences	Yes	No	Don't know
Parents approval is important	143 (48.3)	34 (11.5)	119 (40.2)
Religious beliefs encourage HPV vaccination	56 (18.9)	56 (18.9)	184 (62.2)
Receiving the HPV vaccination is against my cultural beliefs	17 (5.7)	112 (37.8)	167 (56.4)
Ethnic background does not approve of the HPV vaccination	19 (6.4)	100 (33.8)	177 (59.8)
Getting support from family members encourages HPV vaccination uptake	87 (29.4)	55 (18.6)	154 (52.0)
Getting support from friends will encourages HPV vaccination uptake	79 (26.7)	66 (22.3)	151 (50.9)
Receiving counselling about the HPV vaccination will encourage use	99 (33.4)	40 (13.5)	157 (53)
I cannot use the vaccine because it is very expensive	23 (7.8)	89 (30.1)	184 (62.2)
I don't know where to get the vaccine	105 (35.5)	42 (14.2)	149 (50.3)

Table 7:
Test of Associations between variables

	Uptake of HPV Vaccine					
Perception about HPV Vaccination	No	Yes	Total	Fisher's test		
Poor	197 (99%)	2 (1%)	199 (100%)	0.000		
Good	87(89.7%)	10 (10.3%)	97 (100%)			
Total	284 (95.9%)	12(4.1%)	296 (100%)			
	Readiness to Accept HPV Vaccination					
Perception about HPV Vaccination	No	Yes	Total	χ^2	df	p-value
Poor	123 (64.1)	69(35.9%)	192(100%)	6.825	1	0.007
Good	45(47.9%)	49(52.1%)	94(100%)			
Total	168 (58.7%)	118(41.3%)	286(100%)			
	Readiness to Accept HPV Vaccination					
Parental Approval	No	Yes	Total	χ^2	df	p-value
No	97(73.5%)	35 (26.5%)	132(100%)	31.66	1	0.000
Yes	54(39.4%)	83 (60.6%)	137(100%)			
Total	151(56.1%)	118(43%)	269(100%)			

Use of social media for learning and educational engagement are good sources of self-development.

Awareness and perception about HPV was very low, over 85% of them have never heard of HPV. Ilter, *et al*. (2010), indicated that most respondents (56%) in their study were unaware of HPV. Study by Coleman *et al*. (2011) showed that only 40% of respondents were aware of HPV vaccines. Many respondents in present study got their information on HPV mainly from the internet. Respondents who said they have heard of HPV did not really know the meaning.

Many of the respondents did not understand that HPV vaccine prevents genital warts and cervical cancer. Makwe, *et al*. (2012) reported that only 11.1% of adolescent female students in a study in Lagos Nigeria believe that genital HPV infection can cause cervical cancer. Most of them didn't know if HPV is transmitted sexually and many did not realise that having multiple partners increase risk of cervical cancer. Having numerous sexual partners is a major risk factor for cervical cancer, because it increases the chances of HPV infection (Hariri *et al*., 2011).

The study findings show that adolescents' attitude towards HPV virus vaccine varies. Some were of the opinion that if they feel at risk of getting HPV, they will take the vaccine. Most of the respondents in this study had not received HPV vaccine before the study took place but were willing to accept HPV Vaccination. Similar studies have also reported low uptake of HPV vaccination (Juntasopeepun, *et al*, 2012, Brown *et al*, 2015). High acceptance of HPV vaccination or high interest in obtaining HPV vaccines has been reported in various studies (Gerend *et al*., 2013; Iliyasu, *et al*, 2010; Juntasopeepun,*et al*., 2012). Coleman *et al*. (2011) reported that 94% of their respondents were willing to vaccinate themselves or their daughters. Also, according to Iliyasu, *et al*. (2010), of the 375 female undergraduates participants of Bayero University in their study, 277(74.0%) were willing to accept HPV vaccination. Similarly, the rate of willingness to be vaccinated varies in a wide range in the literature, notably 48% (Wong *et al*, 2010), 49% (Mortensen, 2010), 60.2% and 81.7% from one country to another. These variations have been shown among women and adolescents, as many people perceive the use of HPV to cause more harm and damage to their health. For some women, their acceptance of the human papilloma virus vaccine is as result of their environment (home or school), their cultural beliefs and or their age.

This study showed that certain variable influences the use of HPV vaccine among female adolescents. Most of the respondents are of the view that their parents' approval is important before they can receive the vaccination. Parental consent remains a key factor for the administration of medicines or vaccines to minors globally. Getting support from friends will encourage respondents to take the HPV vaccination. This shows the need for the use of peer group educators. Many of the respondents do not know where to go for the HPV vaccine. Over 50% were uncertain if their religious group will encourage them to receive the HPV vaccination.

The high acceptance of HPV vaccination or high interest in obtaining HPV vaccines has been reported among adolescents and young females in many countries worldwide (Gerend *et al*., 2008; Iliyasu, *et al*, 2010). In the study by Slomovitz *et al*, (2013) the rates of acceptability (67% overall) did not differ on the basis of ethnicity (Latina, non-Hispanic white, African-American). On whether the cost of the vaccine will discourage or dissuade them from taking it if available (29.7%) stated that the cost will not dissuade them, while (51.7%) did not know.

There is a significant association between adolescent's perception and readiness to HPV vaccine. This reflects on the fact that most of them have not heard about it and majority of them have not used it. According to Iliyasu *et al*, (2010), age, medical education, and knowledge of HPV and awareness of cervical cancer were confounders and significant predictors of their willingness to accept HPV vaccination. And also majority of them have not used HPV vaccine before. This corresponds with the study conducted in Toronto where a 2000 study examining the level of knowledge about HPV and the Pap test among high school students in Toronto found that 87% of students had never heard of HPV or were unsure if they had, and one third of female students were uncertain who should undergo a Pap test (Dell *et al*. 2000 as cited in Lenehan *et al*. 2008).

There is a significant association between parental approval and readiness to accept HPV vaccination. Some other studies have shown that parental approval is critical before HPV vaccination is administered to adolescents (Constantine *et al*., 2007).

There is need to improve information dissemination on HPV to parents since most of the respondents stated that they need parental approval before they can use the vaccine. More effort should be made to ensure availability of vaccine at cheaper rate by making it part of routine immunization as recommended WHO. World health Organization proposed that HPV vaccination should be incorporated in national immunization programs on condition that prevention of these disease is a priority in the public health sector to make programs sustainable. This is yet to be achieved in many countries (WHO, 2016). Hence, it is essential that Health care Providers focus on strategies to increase HPV awareness, treatment and prevention of HPV infection and its complications.

This study has shown that despite the importance of Human Papilloma Virus vaccination in the prevention of cervical cancer, many adolescents have not heard about it and only a few had received the vaccine. Those that have heard about HPV and cervical cancer have poor knowledge about it and also majority of them got the information from the internet. Majority of them have never used the HPV vaccine and most of them do not have friends or family members who have ever used it. There is a significant relationship between parental approvals being important before adolescents can receive HPV vaccine.

Parents and teachers were the least sources of information. There is need to target parents and teachers in future intervention programmes. Peer educators should be trained to disseminate information on Vaccination. Vaccination should be made available at subsidized rate

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