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Attitude and Perceived Barriers to Uptake of Human Papillomavirus Vaccine among Female Students in a Nigerian Tertiary Institution

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ABSTRACT

Background: *Human papillomavirus (HPV) has been described as an 'equal opportunity' pathogen affecting both sexes and the leading cause of cervical cancer. Vaccination against oncogenic HPV types is a significant step towards decreasing the prevalence, morbidity, and mortality associated with cervical cancer.* ***Objectives:*** *To investigate attitude and perceived barriers to uptake of HPV vaccine among female students in a Nigerian Tertiary Institution.* ***Methods:*** *A cross-sectional questionnaire-based study that was conducted in the University of Nigeria, Enugu Campus from March 01 to April 01, 2017. The representative sample size of 320 female undergraduates was selected using a multistage sampling technique. Data were entered using Microsoft Excel Windows 7 and exported to IBM SPSS version 20.0 software for analysis.* ***Results:*** *Total 38 (13.0%) participants had received HPV vaccine. Majority of the participants had a positive attitude towards HPV vaccination (2.5 ± 6.4). The major perceived barriers to uptake of vaccination were: exorbitant cost of the vaccine (94.1%) and lack of time due to lectures (53.0%). Age of the participants had no influence on the uptake of HPV vaccine whereas department, ethnic group, and marital status had a strong influence on vaccination uptake ($p<0.05$).* ***Conclusion:*** *A low proportion of the participants had received the HPV vaccine. Majority of the participants had a positive attitude towards HPV vaccination. The major perceived barrier to vaccination was the exorbitant cost of the vaccine. The university in collaboration with the Ministry of Health should design strategies to enlighten the university community on HPV infection through seminars and workshops.*

Keywords: Human papillomavirus vaccination, Cervical cancer, Female undergraduates

INTRODUCTION

Human papillomavirus (HPV) has been described as an equal opportunity pathogen affecting both sexes [1]. Up to 80% of sexually active people will acquire an HPV infection of some type at one time or another in their life, thus making HPV the most common sexually transmitted infection (STI) in the world and the leading cause of cervical cancer, which has a very high mortality rate [1,2]. The role of HPV as a human carcinogen was solidified in the late 1970s when Dr. Harold discovered the causal link between HPV infections and cervical cancer [3]. To this day, cervical cancer remains a significant global health burden, the second most common cancer in women and the most common gynecological cancer worldwide [4,5].

Cervical cancer is estimated to affect approximately 560,000 women annually, about 275,000 deaths are recorded each year and more than 55% of these cases occur in developing countries [6]. It is known that about 80% of sexually active females worldwide would have been infected with HPV by the time they get to the age of 50 years or at some point in their lives [2]. HPV is most prevalent in the younger population with the highest rate in the age range of 20 to 30 years which include many college-aged students [7]. World Health Organization estimated that about 23.7%

of women in the general population in Nigeria harbour cervical HPV infection at a time [2]. High burden of cervical cancer has been reported in Nigeria's Federal Capital City, Abuja [8]. More so, a study in Ibadan South-west Nigeria showed an overall prevalence (26.3%) of HPV infection while the prevalence among women without cervical lesions was 24.8% [9]. Another study in Enugu, South-east, Nigeria reported a high incidence (78%) of cervical cancer among younger women below the age of 30 years [10]. University students and young adults have a high prevalence of HPV infection because of their risky sexual behavior, lack of knowledge of HPV infection and HPV-related diseases, and misconception about susceptibility [11]. Studies conducted among university and college students around the world have shown that the awareness of genital HPV infection ranges from 13% to 78%, while the awareness of the HPV vaccines ranges from 10% to 87%. The perceived risk among students of acquiring genital HPV infection ranges from 12.7% to 42% and of developing cervical cancer ranges from 19.9% to 68% [12].

In view of the high burden of cervical cancer, various means of prevention are encouraged. Vaccination against oncogenic HPV types is a significant step towards decreasing the prevalence of the disease, and therefore morbidity and mortality associated with that disease as currently, no cure exists for HPV infection [2]. Studies in South Africa showed high acceptability of HPV vaccine among female university students whereby younger students were more willing to get vaccinated than the older ones [13]. In Nigeria, different studies have shown high acceptability of HPV vaccine among the female populace and intention to receive an HPV vaccine among female university students was relatively high [14-16]. Adolescents and college-aged women showed higher acceptability of vaccine and will recommend such to others more than married women and mothers will do to their children [6].

However, different barriers to HPV vaccine uptake have been identified in the literature. In low resource settings such as Nigeria, the outstanding barriers included: high cost of vaccine and vaccine delivery, low cervical cancer screening level, poor health system capabilities, inaccessibility to medical care, low awareness and knowledge of HPV and cervical cancer, and failure of cervical cancer to be recognized as a major health problem, amongst others [16,17].

Despite the licensure of the HPV vaccines in Nigeria since 2009, and high level of knowledge and acceptability shown by the female populace about the vaccine, the rate of cervical cancer cases in the oncology wards in Government health facilities in Enugu State Nigeria is on the increase. This spurred the researchers to carry out the study to determine the attitudes and perceived barriers to HPV vaccinations among undergraduate female students of the Faculty of Health Sciences and Technology (FHST), University of Nigeria, Enugu Campus who by the virtue of their chosen profession are expected to have knowledge of HPV, the risk of developing cervical cancer from it and also vaccination against the pathogen. The study also assessed perceived factors that might constitute barriers towards the uptake of HPV vaccine as well as the influence of some demographic characteristics such as age, department, ethnic groups, and marital status on uptake of the HPV vaccine.

MATERIALS AND METHODS

The study was conducted in the University of Nigeria, Enugu Campus using a cross-sectional survey research design from March 01 2017 to April 01, 2017. University of Nigeria Enugu Campus is an annex of the University of Nigeria, Nsukka, located inside Enugu town. The population for the study comprised all female undergraduate students (total, 1079) in the Faculty of Health Sciences and Technology, from 200 levels to 500 levels. The 100 level students of the faculty reside at the main campus, Nsukka, and were not included in the study. The sample for the study was determined using Taro Yamane's formula:

$n=N/1+N\ (e)^2$

Where n=sample size; N=Population of study; e=allowable error (0.05) (constant).

The calculated sample size was 291, after adding 10% attrition rate, it became 320. The representative sample size was selected using a multistage sampling technique. The data were collected using a researcher-developed questionnaire. The questionnaire was made up of 2 sections (A and B). Section A dealt with the demographic characteristics of the participants, Section B dealt with the proportion of students that have been vaccinated, their attitudes towards HPV vaccination and perceived barriers to vaccination. The instrument was validated by 3 experts from the Department of Nursing Sciences and Measurement and Evaluation, University of Nigeria, Nsukka. The instrument was pilot-tested using 32 female undergraduate students of the Faculty of Basic Medical Sciences, University of Nigeria, Enugu Campus (that is, 10% of the sample size). Data obtained were analyzed using Cronbach's alpha test which

yielded a reliability coefficient of 0.87. Ethical clearance was obtained from the Ethics and Research Committee of the University of Nigeria Teaching Hospital Ituku-Ozalla, Enugu State. Administrative permit letters were obtained from Heads of Departments and Dean of the Faculty. Verbal informed consent from each study participant was also obtained during data collection. The collected data were coded, categorized and entered into Microsoft Excel Windows 7 and exported to IBM SPSS (Statistical package for social sciences) version 20.0 software for analysis. Data were subjected to simple descriptive statistics of frequency, percentages, mean and standard deviations. Test of association of demographic variables was done using Chi-square test. A probability value of less than 0.05 was considered statistically significant. The results were presented in tables.

Operational Definition

Questions regarding attitude and perceived barriers to uptake of HPV vaccine were prepared using a 4-point Likert scale with the minimum cut-off value of 2.5.

- Positive attitude: Those participants who scored above 2.5 scores of attitude assessing questions
- Negative attitude: Those participants who scored below 2.5 scores of attitude assessing questions
- Perceived barriers to uptake of HPV vaccine: Participants scored above 2.5 scores of questions on barriers to uptake of HPV vaccine

RESULTS

Socio-Demographic Characteristics of the Participants

From the total of 320 sampled study participants, 291 successfully filled and returned the questionnaire yielding a response rate of 91.0%. The age distribution of the participants showed that 177 (60.8%) were between 21-30 years of age. The mean age of participants was 22.6 ± 4.2 SD years. From all study participants, 111 (38.1%) were from Department of Nursing Sciences, 71 (24.4%) medical laboratory sciences, 40 (13.8%) medical radiography and 69 (23.7%) medical rehabilitation; 97 (33.3%) were in 200 level, 49 (16.8%) 300 level, 64 (22%) 400 level and 81 (27.8%) 500 level. Majority 274 (94.2%) of the participants were of Igbo ethnic group, 265 (91.1%) were single in their marital status (Table 1).

Table 1 Socio-demographic characteristics of study participants (n=291)

Variables	Frequency (f)	Percentage (%)
Age category (Years)		
≤ 20	105	36.1
21-30	177	60.8
31-40	9	3.1
X ± SD=22.6 ± 4.2		
Department		
Nursing Sciences	111	38.1
Medical Lab Sciences	71	24.4
Medical Radiography	40	13.8
Medical Rehabilitation	69	23.7
Level		
200	97	33.4
300	49	16.8
400	64	22.0
500	81	27.8
Ethnic Group		
Igbo	274	94.2
Hausa	0	0.0
Yoruba	5	1.7
Others*	12	4.1
Marital Status		
Single	265	91.1

Married	26	8.9
Total	291	100.0
Others*=Ibibio, Tiv		

Proportion of Female Students that had Received HPV Vaccine

Table 2 showed that among all 291 study participants, only 38 (13.0%) had received the HPV vaccine. Out of 38 participants that had received HPV vaccine, 12 (31.6%) received only 1 dose, 5 (13.2%) received 2 doses while 21 (55.3%) had completed the full dosage.

Table 2 Proportion of female students that had received HPV vaccine (n=291)

Variables in the study	Frequency	Percentage
Ever received HPV vaccine (n=291)		
Yes	38	13.0%
No	253	87.0%
Dose(s) received (n=38)		
One (1)	12	31.6%
Two (2)	5	13.2%
Three (3)	21	55.3%

Attitude towards Human Papillomavirus Vaccination

Table 3 showed that the participants had a positive attitude for the following items: "HPV vaccination is necessary" (3.6 ± 0.5); "I will advise my friends to get vaccinated", (3.5 ± 0.6); "vaccine is for rich students" (2.8 ± 1.2); and "vaccine is meant for students with multiple sexual partners" (2.7 ± 0.9) whereas they had negative attitude for the following items: "it doesn't matter whether I am vaccinated or not" (1.8 ± 0.9); "HPV vaccine is recommended for those with signs and symptoms of cervical cancer"(1.3 ± 0.6); "HPV vaccine could affect my reproductive health" (2.0 ± 1.0); and "HPV vaccine is meant only for students that are sexually active" (1.9 ± 0.7). Generally, the majority of the participants had a positive attitude towards HPV vaccination as a mean of means and standard deviation recorded 2.5 ± 6.4.

Table 3 Participants' attitude towards HPV vaccination (n=291)

Variables	Strongly Agreed	Agreed	Disagreed	Strongly Disagreed	Mean	Standard Deviation
HPV vaccination is necessary	187 (64.35%)	94 (32.2%)	7 (2.4%)	-	3.6*	0.5
I will advise my friends to get vaccinated	161 (55.3%)	119 (40.9%)	9 (3.1%)	2 (0.7%)	3.5*	0.6
It doesn't matter whether I am vaccinated or not	16 (5.5%)	44 (15.1%)	92 (31.6%)	139 (47.8%)	1.8	0.9
It is for rich student	113 (38%)	81 (27.8%)	37 (12.71%)	60 (20.6%)	2.8*	1.2
It is for students with multiple sexual partners	54 (18.6%)	121 (41.6%)	87 (29.9%)	29 (10.0%)	2.7*	0.9
It is recommended for those with signs and symptoms of cervical cancer	4 (1.4%)	7 (2.4%)	67 (23.0%)	213 (73.2%)	1.3	0.6
It could affect my reproductive health	19 (6.5%)	34 (11.7%)	175 (60.1%)	63 (21.6%)	2.0	1.0
It is only for students that are sexually active	12 (4.0%)	9 (3.0%)	198 (68.0%)	73 (25.0%)	1.9	0.7
Minimum cut off value=2.5; Mean of means=2.5 ± 6.4; *=Positive attitude						

Perceived Barriers to Uptake of HPV Vaccine

Major perceived barriers to uptake of HPV vaccine by the participants were identified on the following items: "I am not at risk for HPV infection" (2.6 ± 0.9); "my health care provider has not suggested HPV vaccination (2.6 ± 0.9); "I don't have time outside lectures to get vaccinated" (2.9 ± 0.9) and "vaccine is expensive for me" (3.9 ± 0.4) (Table 4).

Table 4 Perceived Barriers to uptake of HPV vaccine (n=291)

Variables	Strongly Agreed	Agreed	Disagreed	Strongly Disagreed	Mean	Standard Deviation
I am not aware of HPV vaccination	0 (0.0%)	8 (2.8%)	236 (81%)	47 (16.2%)	1.9	0.4
I am not at risk	30 (10.3%)	157 (54.2%)	60 (20.6%)	44 (15.0%)	2.6*	0.9
I have fear of side effects	13 (4.3%)	45 (15.4%)	110 (37.9%)	123 (42.4%)	1.8	0.8

I don't know where to go for vaccination	0 (0.0%)	13 (4.3%)	33 (11.5%)	245 (84.2%)	1.2	0.5
My culture doesn't allow vaccination	0 (0.0%)	0 (0.0%)	16 (5.5%)	275 (94.55%)	1.1	0.2
My health provider have not suggested HPV vaccination	62 (21.3%)	84 (28.9%)	113 (38.7%)	32 (11.1%)	2.6*	0.9
I feel shy	4 (1.2%)	21 (7.1%)	36 (12.6%)	230 (79.1%)	1.3	0.7
I don't have time outside lectures to get vaccinated	77 (26.4%)	154 (53%)	24 (8.3%)	36 (12.3%)	2.9*	0.9
Poor attitude of health workers	32 (11.1%)	47 (16.2%)	98 (33.6%)	114 (39.1%)	2	1
It is expensive for me	274 (94.1%)	7 (2.4%)	10 (3.6%)	0 (0.0%)	3.9*	0.4
My husband/ partner will not approve	0 (0.0%)	3 (0.8%)	10 (3.6%)	278 (95.6%)	1.1	0.3
I am not old enough	0 (0.0%)	0 (0.0%)	204 (70.0%)	87 (30.0%)	1.7	0.5
Fear of needles	7 (2.4%)	3 (1.0%)	251 (86.3%)	30 (10.3%)	2	0.2
*Major perceived barriers; Minimum cut off value=2.5						

Influence of Age, Department, Ethnic groups, and Marital status on uptake of HPV vaccine

Table 5 showed that the age of the participants had no significant association (χ^2=0.0226, df=2, p=0.9887) with the uptake of HPV vaccine whereas department, ethnic group, and marital status had a significant association with vaccination uptake (p<0.05).

Table 5 Test of association between demographic variables and uptake of HPV vaccine

Variables	Uptake of HPV vaccine			χ^2	Df	p-value
	No	Yes	Total			
Age (years)						
≤ 20	91	14	105	0.0226	2.0000	0.9887
21-30	154	23	177			
31-40	8	1	9			
Total	253	38	291			
Department						
Nursing Sciences	87	24	111	8.7341	3.0000	0.0330*
Med. Laboratory	65	6	71			
Med. Radiography	37	3	40			
Med. Rehabilitation	64	5	69			
Total	253	38	291			
Ethnic Group						
Igbo	244	30	274	12.8922	2.0000	0.0015*
Yoruba	4	1	5			
Others**	5	7	12			
Total	253	38	291			
Marital Status						
Single	249	16	265	64.6550	1.0000	0.00001*
Married	4	22	26			
Total	253	38	291			
*: Significant; Others**: Ibibio, Tiv						

DISCUSSION

Despite the proven efficacy and potential for reducing the burden and mortality due to carcinoma of the cervix across various settings, the uptake of HPV vaccination is very low in many developing countries, including Nigeria. There are many reasons such as lack of appropriate knowledge about the role of HPV in the causation of cervical cancer and HPV vaccine, lower perceived risk of cervical cancer [20], non-availability of vaccine, and prohibitive cost, amongst others [21]. In the current study, only 13% of the participants had received at least one dose of the vaccine. This proportion is low compared to the high level of knowledge and acceptability of the vaccine showed by the female populace in Nigeria [13,17]. A study was done among female students at the University of Lagos, Nigeria also revealed that only 2.8% of the respondents had received HPV vaccine [13]. This is also in accordance with a

cross-sectional study carried out among medical and para-medical students in India which showed that only 6.8% of the students were vaccinated against HPV infection [18-20]. Similarities of the findings might be that the participants were still in the stage of contemplation or fear of unknown. Despite the low uptake of HPV vaccination, participants in the present study generally held a favorable attitude (2.5 ± 6.4) towards HPV vaccination. The result showed that the majority (64.3%) of the participants thought that HPV vaccination is necessary and are willing to advise their friends to get vaccinated to prevent the occurrence of carcinoma of the cervix. This finding is in contrast with a study carried out on global uptake and impact of attitudes on female HPV vaccination which revealed that a reasonable proportion of clinicians still have significant reservations about promoting vaccination, particularly among younger age groups [21]. This shows that clinicians are not strong advocates of vaccination. Thus, the commitment now, to fully educating both the public and clinicians, has the potential to make a dramatic future impact [21].

The major perceived barriers to vaccination identified by the participants were: exorbitant cost of the vaccine (94.1%), not at risk for HPV infection (54.2%), and lack of time due to lectures (53.0%). These findings are also in tandem with the study carried out by Hopkins and Wood which listed global barriers to HPV vaccination as cost, low self-perceived risk, side-effects, and safety, efficacy and potential of vaccination to promote sexual activity [21]. According to Adejuyigbe, et al., accessibility, affordability, and insufficient knowledge have also been identified as possible barriers to future utilization of HPV vaccines [15]. In Nigeria, the HPV vaccine is not included in the National Immunization Program and as such, they are paid out of the client's pocket. As at 2015, with discount by GAVI Alliance, HPV vaccine cost in Nigeria was N9000-N15000, that is, $30-$50 but with increased inflation of goods and devaluation of Naira, the price of the vaccine has increased and this price is above the minimum wage of Nigerians. The high price and low health insurance coverage limit access to this essential life-saving vaccine.

Findings from the study also revealed that the department, ethnic group and marital status of the participants had an influence on the uptake of HPV vaccine whereas the age of the participants had none. Similar study among adults in Quebec found out that the proportion of individuals aged 18-25 years which is one of the most important target groups for the vaccine changed their perceptions of the vaccine once cost was added as a factor, with the rate of people who would strongly agree that they would get the vaccine falling from 56% to 28% if individuals had to pay. This change was not as drastic for individuals aged 26-30 years [22]. One can presume that this is due to the increased financial resources of this group. More so, a study carried out among medical and paramedical students in India showed that nursing students had increased knowledge of HPV vaccination unlike their counterparts and thus have an increased the probability of getting vaccinated [20]. In another study to determine the barriers and facilitators to uptake of the school-based HPV vaccination programme in an ethnically diverse group of young women, results showed that belief of ethnic group in regards to sexual activity may affect uptake. For an ethnic group that discourages pre-marital sex, there might be low uptake of vaccination as there is a low perceived risk of getting infected with the virus. Religious and cultural factors have been shown to affect immunization rates among different ethnic groups especially in low-income countries like Nigeria. Differences in religious affiliation were found to be associated with differences in immunization rates in a study conducted in Nigeria, where immunization rate was 66% among Christians but only 32% among Muslims. The Ibos, who are predominantly Christians and second largest majority ethnic group, have a higher probability of receiving HPV vaccines more than the Hausas and Yorubas who are predominantly Muslim and African traditionalist and other minority groups [23]. The study further showed a significant relationship between participants' marital status and uptake of the HPV vaccine. This is in line with the studies carried out on the influence of marital status on HPV vaccination which revealed that married women or women in a relationship were less likely to be vaccinated or intend to be vaccinated [24-26]. Among college students, women who were not in a relationship or not living with their partner were more likely to be vaccinated compared to women in a relationship and living with their partner [27]. This is because those in a monogamous relationship have a low perceived risk for contacting human papillomavirus.

CONCLUSION

The findings of this study showed that a low proportion of the participants had received at least one dose of the vaccine and the majority had a positive attitude towards HPV vaccination. Department, ethnic group and marital status, had a significant influence on vaccination uptake. It will be of immense benefit to integrate HPV vaccination program into the National Programme on Immunization in order to minimize cost and facilitate vaccination. The university in collaboration with Ministry of Health should design strategies to organize seminars and workshops

within the university settings enlightening the university community on HPV infection and vaccination and cervical smear screening programs as this will help to reduce the mortality rate associated with carcinoma of the cervix.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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