



# Human Papilloma Virus Vaccination: Knowledge, Attitude and Uptake among Female Medical and Dental Students in a Tertiary Institution in Benin-City, Nigeria.

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## ABSTRACT

### Background

Human papilloma virus (HPV) infection is implicated in the cause of cervical cancer which is the second most common cancer in women worldwide. HPV vaccination is a primary prevention tool against HPV infection, thus the need to assess the knowledge, attitude and uptake of HPV vaccination among female medical and dental students.

### Methodology

A descriptive cross sectional study was carried out among all undergraduate female medical and dental students in the University of Benin. Data was collected using a pretested, semi-structured, self-administered questionnaire. The questionnaires comprised of socio-demographic characteristics, knowledge of HPV vaccination, attitudes towards HPV vaccination and uptake of HPV vaccination

### Results

Two hundred and eighty questionnaires were administered however only 215 returned their completed questionnaires giving a response rate of 76.7%. The mean age of respondents was  $22.4 \pm 3.0$  years. Only about a third of the respondents (31.2%) had a good knowledge of HPV infection and vaccination. Age ( $p = 0.001$ ), faculty ( $p = 0.014$ ) and level of study ( $p = 0.014$ ) was observed to be significant determinants of knowledge. A higher proportion of respondents (61.8%) had a positive attitude towards HPV vaccination while only a few (3.7%) had taken the HPV vaccine. Significant determinants of attitude towards HPV vaccination were age ( $p = 0.001$ ), faculty ( $p = 0.014$ ), level of study ( $p = 0.001$ ) and knowledge ( $p = 0.031$ ) of respondents. Uptake of HPV vaccination was significantly associated with attitude of respondents ( $p = 0.001$ ).

### Conclusion

The knowledge and uptake of HPV vaccination among these students was generally poor though most of them had positive attitude towards HPV vaccination. This emphasizes the need for educational interventions to improve knowledge which will in turn enhance uptake.

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## INTRODUCTION

Human papilloma virus (HPV) infection is implicated in the cause of cervical dysplasia and cancer as well as genital warts.<sup>1,2</sup> Cervical cancer is the second most common cancer in women worldwide and also the third leading cancer worldwide irrespective of gender.<sup>2-4</sup> More than eighty percent of the 274,000 deaths resulting from cervical cancer each year, occur in developing countries, and this proportion is expected to

increase to 90% by 2020.<sup>5</sup> Beyond cervical cancer, HPV is etiologically associated with 90 -93% of cases of cancer of the anus, 12-63% of cases of cancer of the oropharynx, 36 -40% of cases of cancer of the penis, 40 -64% of cases of cancer of the vagina and 40 -51% of cases of cancer of the vulva.<sup>6</sup>

HPV vaccination is a primary prevention tool against the two most prevalent oncogenic strains of HPV (16 and 18) which are responsible for about 70% of cervical cancer worldwide. However,

screening later in life is recommended as HPV types other than 16 and 18 are responsible for up to 30% of all cases.<sup>7</sup> The vaccine appears to have partial efficacy against infections caused by HPV types 31 and 45 which are genetically related to type 16 and 18.<sup>8,9</sup> Vaccinating girls and women before their sexual debut or those who are naïve to these two strains has potential to reduce the burden by 70%.<sup>7</sup> Modeling studies have shown that if fully implemented, vaccination may lead to 66% reduction in pre-cancerous lesions which translate to about 76% decline in cervical cancer deaths.<sup>10</sup> In Nigeria, two vaccines, Gardasil-quadrivalent (Merck) and Cervarix-bivalent (GlaxoSmithKline) have been approved in line with the World Health Organization recommendation but still no national policy or programme to that effect. The recommended age range for routine immunization against HPV for females is 9 years to 26 years. Currently the vaccine is neither widely available nor affordable in Nigeria.<sup>11</sup>

Knowledge of cervical cancer, HPV infection and vaccine is fundamental to making informed decision as regards HPV vaccine acceptance. Several studies have documented poor knowledge and attitude towards HPV infection and vaccination as one of the determinants of vaccine uptake among females.<sup>12, 13, 14</sup> There is paucity of data on knowledge and attitude of female medical students towards HPV infection and vaccination. However, amongst the few studies conducted among medical students knowledge gaps on HPV infection and vaccine were observed.<sup>4, 15</sup> A study in South West, Nigeria among medical students reported good knowledge of HPV infection among two-thirds of the respondents but poor knowledge on HPV vaccination.<sup>16</sup> Knowledge of Physician's has also been shown to determine their recommendation of HPV vaccine, which has been reported by various studies as one of the predictors of HPV uptake.<sup>17,18,19</sup> . Good knowledge and attitude towards HPV infection and vaccine among medical students and health care providers is essential to achieving a high

level of HPV vaccine uptake. This study focused on the knowledge, attitude and uptake of HPV vaccination among female medical and dental undergraduates cognizant of the fact that the study population are potential health workers and play a vital role in the dissemination of health information to the general public. Also, the study population consists of young females who are at higher risk of contracting HPV infection. Furthermore, the study findings will also provide baseline data necessary for the development of training programs.

## METHODOLOGY

A descriptive cross sectional study was conducted among female medical and dental students in the University of Benin. The University of Benin is located in the Benin metropolis which is the capital city of Edo state. The School of Medicine and Dentistry as at the time of the study had 207 and 73 females respectively spread across six levels. All female medical students in both the School of Medicine and Dentistry participated in the study. The study spanned over a 12 months period from September, 2012 to August, 2013.

Ethical clearance to conduct the study was obtained from the University of Benin Teaching Hospital Ethical Committee. Approval to conduct the study was sought from the University authority and verbal informed consent was obtained from participants.

### Method and Tool for data collection/ Data analysis

Quantitative method of data collection was utilized with the aid of pretested semi-structured, self-administered questionnaires. The questionnaires focused on the following: Socio-demographic characteristics, knowledge of HPV vaccination, attitudes towards HPV vaccination and uptake of HPV vaccination. Data collected was analyzed using IBM SPSS version 21 software.

In scoring knowledge, one point was awarded for every correct answer and zero for incorrect or 'do

not know' responses. The total knowledge score was then converted into percentages and classified as follows. Poor knowledge score was a score  $\leq$  49.9% , fair knowledge 50.0% to 69.9% and good knowledge was any score  $\geq$  70.0%.

A 5-point Likert scale ranging from “strongly disagree” to “strongly agree” was used in scoring attitudes toward the HPV vaccination. The scale consisted of 5 subscales including “safety concerns”, “perception of needs”, “risky sexual behavior” ,“importance of prevention” and “ intentions to receive vaccination”. Five points was given to 'strongly disagree' responses, four points to 'disagree' responses, three points to 'no opinion' responses, two points to 'agree' responses and a point to 'strongly agree'. For negative questions the scoring system was reversed. The total attitude score was then converted into percentages and classified as follows: score of 50.0 to 100.0% represented a 'positive attitude', while 0% to 49.9% was adjudged 'negative attitude'.

Univariate analysis was done for all variables. Bivariate analysis was done to determine association between age group, faculty of respondent and level of study respectively with knowledge of HPV, attitude towards HPV vaccine and practice of HPV vaccination using the chi-square ( $\chi^2$ ) test and the fisher's exact test where appropriate. p- value of  $<0.05$  was considered statistically significant.

## RESULTS

Two hundred and eighty questionnaires were administered to all female medical and dental students in the study area, however only 215 returned their completed questionnaires giving a response rate of 76.7%.

One hundred and thirty three (61.9%) of the respondents were within the age group of 20-24 years with a mean age of  $22.4 \pm 3.0$  years. Respondents predominantly belonged to the faculty of medicine

176 (81.9%). Sixty five (30.2%) of the respondents were in their pre-clinical level while 150 (69.8%) were in their clinical level.

One hundred and eighty three respondents (85.1%) had heard of human papilloma virus. Their source of information was mainly from school lectures 148 (78.7%). All of the respondents (100.0%) have heard of cervical cancer and their source of information was alsomainly from school lectures 144 (67.0%).

One hundred and eighteen (91.8%), 116 (63.4%) and 54 (29.5%) of the respondents had a correct knowledge that HPV cause cancer of the cervix, can cause genital warts and cannot cause Herpes respectively. One hundred and fifty four respondents (84.2%) had a correct knowledge that a vaccine exist to prevent HPV infection/cancer of the cervix while 141 respondents (77.0%) had a correct knowledge that the vaccine is available in Nigeria. (Table I)

Table I: Knowledge of Respondents on HPV Infection and Vaccination

Knowledge	Frequency n = 183		
	(%)		
	Yes	No	Don't know
HPV can cause herpes.	54(29.5)	65(35.5)	64(35.0)
Genital warts are caused by HPV.	116(63.4)	10(5.5)	57(31.1)
HPV can cause cancer of the cervix.	168(91.8)	1(0.6)	14(7.6)
If a woman's pap smear is normal, she does not have HPV.	34(18.6)	78(42.6)	71(38.8)
Changes in a pap smear may indicate that a woman has HPV.	125(68.3)	8(4.4)	50(27.3)
HPV is transmitted via faeco-oral route.	95(51.9)	25(13.7)	63(34.4)
Most people with HPV have no visible signs or symptoms.	117(63.9)	13(7.1)	53(29.0)
One can transmit HPV to his/her partner even if he/she does not have symptoms.	144(78.7)	9(4.9)	30(16.4)
Having one type of HPV strain means that one cannot acquire new types.	93(50.8)	12(6.6)	78(42.6)
A vaccine exists to prevent HPV infection/cancer of the cervix.	154(84.2)	3(1.6)	26(14.2)
The vaccine is available in Nigeria.	141(77.0)	2(1.1)	40(21.9)
One dose of the vaccine is enough to confer immunity against the virus.	46(25.1)	33(18.1)	104(56.8)
The HPV vaccine is very cheap.	82(44.8)	12(6.6)	89(48.6)
HPV vaccine is required by sexually active individuals.	47(25.7)	106(57.9)	30(16.4)

Fifty seven respondents (31.2%) had an overall good knowledge while 65 (35.5%) had poor knowledge of HPV vaccination. (Table II)

One hundred and eighty two respondents (99.5%) had a positive attitude towards HPV vaccination while 1 (0.5%) had a negative attitude respectively towards HPV vaccination. (Table III)

Table II: Predictors of Knowledge of HPV Infection and Vaccination among Respondents

Variable	Knowledge of HPV infection and vaccination n (%)		
	Poor	Fair	Good
Age group (years)			
< 20	13 (72.2)	5 (27.8)	0 (0.0)
20-24	38 (32.8)	45 (38.8)	33 (28.4)
25-29	10 (21.3)	13 (27.7)	24 (51.0)
≥ 30	0 (0.0)	2 (100.0)	0 (0.0)
Fischer's exact = 25.716, p = 0.001			
Faculty			
Medicine	47 (31.1)	50 (33.1)	54 (35.8)
Dentistry	14 (43.8)	15 (46.9)	3 (9.3)
$\chi^2 = 8.573, p = 0.014$			
Level of study			
Pre-clinical	24 (68.6)	11 (31.4)	0 (0.0)
Clinical	37 (25.0)	54 (36.5)	
$\chi^2 = 8.573, p = 0.014$			
Total	61 (33.3)	65 (35.5)	

Table III: Predictors of Attitude towards HPV Vaccination among Respondents

Variable	Attitude towards HPV Vaccination n(%)	
	Positive	Negative
Age group (years)		
< 20	17 (94.1)	1 (5.6)
20-24	116 (100.0)	0 (0.0)
25-29	47 (100.0)	0 (0.0)
≥ 30	2 (100.0)	0 (0.0)
Fischer's exact = 25.716, p = 0.001		
Faculty		
Medicine	150 (99.3)	1 (0.67)
Dentistry	32 (100.0)	0 (0.0)
$\chi^2 = 8.573, p = 0.014$		
Level of study		
Pre-clinical	11 (31.4)	24 (68.6)
Clinical	111 (75.0)	37 (25.0)
$\chi^2 = 53.414, p = 0.001$		
Knowledge		
Good	60 (98.4)	1 (1.6)
Fair	65 (100.0)	0 (0.0)
Poor	57 (100.0)	0 (0.0)
Fischer's exact = 8.786, p = 0.031		
Total	182 (99.5)	1 (0.5)

Only 8 (3.7%) of the respondents had taken HPV vaccine and of these only 2 (0.9%) had completed the dose. Also, among those that had received the vaccine 50.0% had it before sexual debut and the other 50.0% after sexual debut.

The practice of HPV vaccination was observed to increase with increasing knowledge however the association was not statistically significant. Also, practice of HPV vaccination increased with positive attitude and this association was statistically significant. (Table IV)

Table IV: Predictors of Uptake of HPV Vaccination among Respondents.

Variable	Uptake of HPV n (%)	
	Yes	No
Knowledge		
Poor	1 (1.6)	60 (98.4)
Fair	3 (4.6)	62 (95.4)
Good	4 (7.0)	53 (93.0)
Fischer's exact = 2.023, p = 0.395		
Attitude		
Negative	0 (0.0)	1 (100.0)
Positive	8 (4.4)	174 (95.6)
Fischer's exact = 169.824, p = 0.001		

## DISCUSSION

Medical students are expected to have adequate knowledge on issues regarding health by virtue of their training to become future health care providers. Majority of the respondents had heard of HPV and its vaccination and school lectures were their main source of information. Similar findings were seen among medical students in South West, Nigeria<sup>16</sup>, India<sup>20</sup> and China.<sup>21</sup> This is not surprising as HPV is supposed to be part of the medical curriculum. Contradictory findings were reported in similar studies among medical students where 30.0% in Southern Italy, 37.0% United States and 22.0% of the respondents in South Africa were aware of HPV vaccination.<sup>22 - 24</sup> All respondents had heard of cervical cancer. This was in tandem with a study conducted in South West, Nigeria in which 95.4% of the respondents had

heard of cervical cancer.

Only about a third of respondents had a good knowledge of HPV infection and vaccination. This is in contrast with result from a study done in Malaysia<sup>25</sup> and South West Nigeria<sup>16</sup> which showed that 62.9% and 67.1% of the medical students respectively had good knowledge about HPV and its vaccination. However, findings were in line with that observed in a systematic review done in Sub-Saharan Africa which also showed low knowledge of respondents on HPV and its vaccine.<sup>26</sup> The observed knowledge gap in this study is a set back to HPV vaccination programmes especially as it regards health care providers in training. Knowledge of HPV among the studied population is of utter most importance as this may inform their recommendation to the entire public consequently hampering HPV vaccine uptake. This further reiterates the need for educational interventions to improve their knowledge on HPV infection and vaccine which will in turn improve HPV vaccine uptake.

The proportion of respondents who had good knowledge of HPV vaccination increased with increasing level of study and the association was statistically significant. This finding is consistent with that in a study done in Turkey which showed a statistically significant association between the mean knowledge score of HPV and the class of the students.<sup>27</sup> Also, others studies in Nigeria also showed significant association.<sup>16,28,29</sup> This is expected as with increasing level of study students are more exposed to practical and clinical aspect of their training and more likely to have more in-depth knowledge. This implies that if majority of those with poor knowledge were in pre-clinical levels, hence their knowledge will be improved when they move to the clinical levels thereby attaining sufficient information to recommend HPV vaccine to their clients, consequently improving uptake.

A higher proportion of respondents in the Faculty of Medicine than those in Dentistry had good knowledge of HPV vaccination and this association was statistically significant. This is in line with the findings from a study done in Malaysia which also showed a significant statistical association between total knowledge score and respondents in medicine and dentistry.<sup>24</sup> A possible explanation to this finding is that the curriculum of the medical students addresses every aspect of the body unlike the former which concentrates mainly on oral health. Information about HPV infection and vaccines should be incorporated into the curriculum of dental students so as to improve their knowledge because they also serve a vehicle in disseminating information to the general public.

Despite the fact that the knowledge of HPV infection and vaccination was mainly poor, a higher proportion of respondent had a positive attitude towards HPV vaccination. This could be the resultant effect of presence of childhood immunization which is universally known to prevent childhood diseases so one may infer that any new vaccine is important in preventing the targeted disease. Similar findings were observed in studies carried out in UK<sup>30</sup> South Africa<sup>21</sup> and Lagos, Nigeria<sup>31</sup> where 88.1%, 80.0% and 70.2% of the respondents respectively were willing to accept HPV vaccination.

The proportion of respondents who had a positive attitude towards HPV vaccination increased both with increasing level of study and age. These associations were statistically significant. This could be explained because with increasing level of study, there is more exposure to information concerning the disease which could translate to a better attitude towards its vaccination.

Uptake of HPV vaccination was low as only a few respondents had received it. This finding is in accordance with results observed in studies done in



USA<sup>32</sup> and Malaysia<sup>25</sup>. Majority of those vaccinated had good knowledge; one can infer that good knowledge translates to increased uptake. However, studies done in the Netherlands contradicts this findings.<sup>33, 34</sup> This low vaccination rate among the respondents despite a good attitude toward the vaccine could be because the vaccine was introduced in Nigeria in September 2008 and awareness is not yet optimal as evident by the poor knowledge. Alternatively low uptake may be the resultant effect of cost as the vaccine is not given free unlike most childhood vaccines.

Findings from this study indicate that since uptake was low among the respondents, HPV vaccination to their clients will be unlikely and this may be attributed to the poor knowledge observed in this study. Further study is recommended to identify other factors influencing uptake. This low uptake of HPV vaccination predisposes women to HPV infection which can otherwise be prevented by vaccination. This could in the long term lead to an increased prevalence of HPV infection and its consequences.

A possible limitation of the study was recall bias as the study did not take into consideration the time lectures on cervical cancer, HPV infection and vaccination were rendered to the different categories of students. In addition, the study did not address if the students knew the information but failed to remember or never knew the information. Furthermore, the cross-sectional nature of the study also makes it difficult to conclude that knowledge was responsible for uptake bearing in mind that other factors may have influenced uptake.

In conclusion, gaps existed in knowledge and uptake of HPV vaccination among medical students and this has to be addressed. Despite this, most of the respondents were observed to have a positive attitude. There is need for more intense educational

intervention as regards HPV infection and vaccination as well as its relation to cervical cancer in medical curriculum so as to improve knowledge which will in turn improve uptake and successful implementation of HPV vaccination programmes.

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