

Association between Knowledge of Cervical Cancer/Screening and Attitude of Teachers to Immunization of Adolescent Girls with Human Papilloma Virus Vaccine in Abakaliki, Nigeria

Ajah LO^{1,*}, Iyoke CA², Ezeonu PO¹, Ugwu GO², Onoh RC¹, Ibo CC¹

¹Department of Obstetrics and Gynaecology, Federal Teaching Hospital, Abakaliki, Nigeria

²Department of Obstetrics and Gynaecology, University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria

*Corresponding author: leokpanku@yahoo.com

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Abstract Background: Majority of the target population for HPV vaccination for the primary prevention of cervical cancer in Nigeria are found in secondary schools. **Aim:** To describe the knowledge and attitude of secondary school teachers in Abakaliki towards HPV vaccination, and determine if the attitude of teachers supports a possible role for teachers in promoting the uptake of the vaccine. **Methodology:** A cross-sectional questionnaire-based study involving secondary school teachers was carried out. Data analysis involved both descriptive and inferential statistics at 95% confidence level using the SPSS software version 16. P -value ≤ 0.05 was considered statistically significant. **Result:** A total of 412 teachers participated in the study. Approximately 78% were aware of cervical cancer and 75% of these were aware of at least one method of cervical cancer prevention. Eighty-six percent of those aware of cervical cancer knew that HPV infection was the cause of cervical cancer; although only 40.3% of these knew that HPV vaccine that protected against cervical cancer was available in the city. Approximately 70% of teachers who were aware of cervical cancer were willing to recommend HPV vaccination to children under their care. Age ≥ 31 years, knowledge of cervical cancer screening, knowledge of the relationship of HPV to cervical cancer, and previous experience of cervical cancer screening, were significantly associated with acceptability of HPV vaccine by secondary school teachers. **Conclusion:** A good majority of secondary school teachers in Abakaliki were aware of the Human Papilloma Virus vaccine for preventing cervical cancer and over two-thirds of these were favourably disposed to recommending its use. Public health practitioners could therefore enlist teachers in programmes for influencing adolescent girls and their parents towards increased uptake of the vaccine in our environment.

Keywords: cervical cancer, acceptability, HPV vaccine, secondary school teachers, Abakaliki

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1. Introduction

Cervical cancer is responsible for the death of many women globally and it is estimated that about 80% or more of the world burden of cervical cancer is in the developing countries. [1,2] About 47.72 million Nigerian women are at risk of cervical cancer and the crude incident rate per 100,000 population is 17.1 while the age-standardized incidence per 100,000 population is 29.0. [3] The annual number of cervical cancer cases in Nigeria is 14,089 and the annual number of cervical cancer death is 8240. [3] This is a major public health challenge and the number may increase if effort towards its reduction is not put in place. [4] The high cervical cancer burden in our

environment has been ascribed to ignorance, lack of resources and unavailability of nationally-organized screening programs. [5,6,7,8,9] Several studies have shown poor knowledge of the disease in Africa, which even cuts across different literacy levels [5,6,7,8,9].

The prevention strategies for cervical cancer comprise immunization against HPV infection among adolescents prior to the first sexual exposure as a form of primary prevention or screening for evidence of pre-invasive lesions of the cervix among adult females using the Papanicolaou smear (Pap smear) as a form of secondary prevention. The Papanicolaou (Pap) smear has reduced the incidence of cervical cancer in the developed countries where nationally-organized screening programs exist. [2,4,10] The most effective preventive method against cervical cancer among adolescent girls and other women

prior to sexual exposure is the primary prevention by the HPV vaccination [11,12].

The World Health Organisation recommends offering HPV vaccine to girls at ages 9–14 years, prior to sexual exposure, since the vaccine has highest efficacy if girls have not already acquired HPV. [13] The Nigerian Federal Ministry of Health targets girls at ages of 9-15 years for HPV vaccination. [14] Unlike the vaccines for childhood diseases, HPV vaccination in Nigeria is not currently provided during free mass immunization programmes, but the vaccine is available for individual use at a rather expensive rate. Both the bivalent and quadrivalent vaccines are available in Nigeria: the bivalent vaccine which is more widely available costs about \$50 (N8,000.00) while the quadrivalent one costs about \$100 (N16,200.00), exclusive of cost of giving the injection. [15] Although Nigeria is listed as eligible for subsidization of the cost of HPV vaccine under the Global Alliance for Vaccines and Immunisations (GAVI) programme, she is currently not approved for the funding. [16] Under the GAVI funding programme, the cost of the bivalent vaccine would be reduced to \$4.50 (equivalent of N756.00) per dose. [17] However, anecdotal evidence from free childhood immunization in Nigeria suggests that reducing or removing the cost of immunization is not enough to ensure good uptake: substantial and consistent mass education and mobilization are needed.

It would appear that there is poor uptake of the HPV vaccine by the target population. Meanwhile, a majority of the target population for HPV vaccination are found in secondary schools. It is arguable that secondary schools could be avenues for health education on cervical cancer prevention and HPV vaccination of this group. Teachers could have the dual capacity to educate adolescent girls on the need for the vaccination and also advise their parents to vaccinate their daughters. The knowledge of cervical cancer and acceptability of HPV vaccine by secondary school teachers might therefore impact positively on the uptake of HPV vaccine by this target population in Nigeria.

Few studies have evaluated the acceptability of the HPV vaccine in Nigeria and we found no such studies in Ebonyi state in particular. The aim of this study was to evaluate the knowledge and acceptability of the HPV vaccine among secondary school teachers in Abakaliki, South East Nigeria and explore the feasibility of enlisting teachers towards promoting the uptake of the vaccine.

2. Methodology

Abakaliki is the capital of Ebonyi State with an estimated population of 4.3 million according to the 2006 national census. It occupies a land mass of 5,935 square kilometres. About 75% of the population of Ebonyi state dwells in the rural areas with farming as the major occupation. [18] There are eleven local government areas in Ebonyi state and Abakaliki city consists of two Local Government Areas namely Abakaliki and Ebonyi. This was a school-based cross-sectional study. The study took place between February 3, 2014 and April 30, 2014. Permission to interview teachers and the comprehensive list of the secondary schools were obtained from Ebonyi State Post-primary School Management Board. The

sampling frame consisted of 38 secondary schools in Abakaliki urban. There were 750 and 1,341 male and female teachers respectively in these schools. The participants for the study were selected through multi-stage sampling. Fifteen secondary schools were initially selected through simple random sampling. Then using the list of teachers in each selected school as a sampling frame, systematic random sampling was used to select the total number of samples allocated to each school. A random start was made and thereafter every teacher with even serial number was selected. The number of samples allocated to each of the 15 secondary schools was proportionate to the population strength of teachers in these schools.

To determine the minimum sample size for the study, we used an acceptability rate of 91%, [10] for the HPV vaccine obtained in a previous study from Enugu, South-East Nigeria. The minimum sample size for the study was calculated based on the formula for estimating sample size for prevalence studies described by Daniel, [19]:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

where n = sample size, Z = z statistics for 95% level of confidence, P = expected prevalence or proportion, and d = precision. With $Z=1.96$, $P=0.91$, and $d=0.05$, and adding an assumed attrition rate of 20%, the calculated minimum sample size was 151.

Pretesting of questionnaires was done among a group of 20 teachers in one secondary school in Abakaliki. Following individual counselling, self-administered, structured and pretested questionnaires were distributed to the consenting teachers by trained research assistants. Data sought consisted of socio-demographic characteristics of respondents, knowledge of cervical cancer, awareness and acceptability of the HPV vaccine. Data analysis was both descriptive and inferential at the 95% confidence level using the SPSS software version 16.0 [SPSS Inc., Chicago, Ill.]. Tests of significance were done with Chi-square or Fischer's exact test where appropriate. A P -value of less than or equal to 0.05 was considered statistically significant. Acceptability of HPV vaccine was defined as *the willingness of the secondary school teacher to recommend the vaccine to his or her adolescent daughters, students, and daughters of friends and relations*.

All the consenting secondary school teachers with even serial numbers from the 15 randomly selected schools were included in the study. However, the teachers with odd serial numbers and those who, despite adequate counselling, declined to give consent to participate in the study were excluded.

Ethical clearance for the study was obtained from the Ethics Committee of Federal Teaching Hospital, Abakaliki.

3. Results

A total of 412 respondents who completed their questionnaires out of 456 who were administered with questionnaires were used for the study giving a response rate of 90.4%. The mean age of the respondents was 36.7

± 8.4 years. Three hundred respondents were female teachers. **Table 1** showed the socio-demographic variables of the teachers. Majority of the respondents had bachelor degree, were married and were teaching art subjects. **Figure 1** shows female respondents who had ever had cervical cancer screening.

Table 1. Socio-demographic variables of the respondents

Socio-demographic variables	Frequency (n=412)	Percentage
Age distribution(years)		
21-30	112	27.2
31-40	184	44.7
41-50	88	21.4
51-60	24	5.8
61-70	4	1.0
Sex of respondents		
Male	112	27.2
Female	300	72.8
Educational Qualification		
National Certificate in Education	53	12.9
Bachelor Degree	323	78.4
Master Degree	34	8.3
Doctor of Philosophy Degree	2	0.5
Marital status of respondents		
Married	326	79.1
Single	78	18.9
Widowed	1	0.2
Separated	4	1.0
Divorced	3	0.7
Religion		
Christianity	404	98.1
Islam	2	0.5
African Traditional Religion	6	1.5
Subject thought		
Science	170	41.3
Art	242	58.7

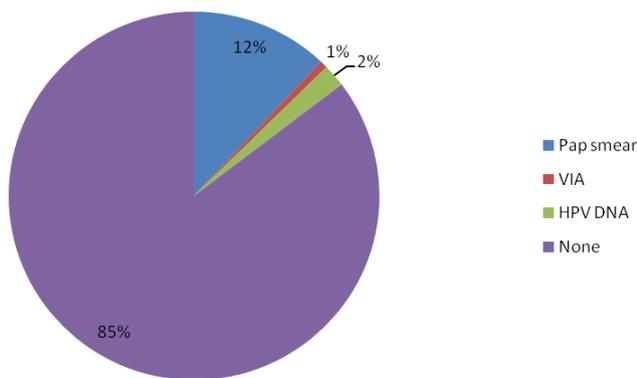


Figure 1. Pie chart showing female respondents who had had cervical cancer screening

Table 2 summarizes the knowledge and attitude of secondary school teachers in Abakaliki to cervical cancer, its screening and HPV vaccination. Approximately 78% (320/412) of the teachers were aware of cervical cancer and of cervical cancer screening. About 79.4% (254/320) of those aware of cervical cancer were aware that HPV was the cause of cervical cancer. However, 37.5% (120/320) of teachers who were aware of cervical cancer knew that HPV vaccine that protected against HPV infection and cervical cancer was available in Ebonyi state. Approximately 70% (222/320) of teachers who were

aware of cervical cancer would accept and recommend HPV vaccine to their daughters, students or daughters of friends and relations.

Table 2. The awareness and attitude of secondary school teachers in Abakaliki to cervical cancer, its screening and HPV vaccine

Awareness and attitude	Frequency(N=412)	Percentage
Awareness of cervical cancer (n=412)		
Yes	320	77.7
No	92	22.3
Awareness of cervical cancer screening (n=320)		
Yes	222	69.4
No	98	30.6
Cause of cervical cancer(n=320)		
Spiritual attack	9	2.8
Human Papilloma Virus	254	79.4
Poisoning by enemies	17	5.3
Do not know	40	12.5
Who should receive HPV vaccine? (n=320)		
Adolescent girls/women prior to sexual exposure	66	20.6
Women who have cervical cancer	48	15.0
Women who were positive to HPV DNA test	48	15.0
None of the above	4	1.3
Do not know	154	48.1
Mechanism of action of HPV vaccine (n=320)		
Protects against HPV infection	120	37.5
Destroys HPV in infected people	16	5.0
Cures cervical cancer	28	8.8
Do not know	156	48.8
Acceptability of HPV vaccine (n=320)		
Yes	224	70
No	96	30

Table 3. Factors determining the acceptability of HPV vaccine by secondary school teachers in Abakaliki

Acceptability			
Factors	Yes(%) n=224(100)	No(%) n=96(100)	P-value
Sex			
Male	63 (28.1)	33(34.4)	0.26
Female	161(71.9)	63 (65.6)	
Age			
≤30 years	66 (29.5)	39(40.6)	0.05*
≥31 years	158(70.5)	57(59.4)	
Target group for HPV vaccination			
Correct answer	41 (18.3)	2(2.1)	<0.01*
Incorrect answer	183(81.7)	94(97.9)	
Mechanism of action of HPV vaccine			
Correct answer	81(36.2)	9(9.4)	<0.01*
Incorrect answer	143(63.8)	87(90.6)	
Cause of cervical cancer			
Correct answer	201(89.7)	55(57.3)	<0.01*
Incorrect answer	23(10.3)	41(42.7)	
Subject being taught by the respondents			
Science	95(42.4)	49 (51.0)	0.15
Art	129(57.6)	47(49.0)	
Female respondents who had been screened(n=300):			
Yes	161(100)	139(100)	<0.0001*
No	40(24.8)	4(2.9)	
	121(75.2)	135(97.1)	

Table 3 describes the factors determining the acceptability of HPV vaccine by the secondary school teachers in Abakaliki. Age ≥31 years, knowledge of target group for HPV vaccination, knowledge of mechanism of

action of HPV vaccine and being previously screened for cervical cancer, were significantly associated with acceptability of HPV vaccine.

4. Discussion

This study was motivated by two considerations. The first is that Nigeria is eligible for GAVI funding that would substantially reduce the cost of the HPV vaccine and the expectation that Nigeria may eventually obtain approval for the GAVI funding. [17] Second is the empirical observation that uptake of immunization does not depend only on the cost of immunization. For instance, the free childhood immunization required persistent mass education and mobilization to register substantial uptake. To maximize the benefit of any subsidy on the cost of the HPV vaccine therefore, ways of augmenting existing structures for immunization in order to maximize the uptake of the HPV vaccine needs to be explored.

The study found a fairly high level of knowledge about cervical cancer and its screening, suggesting that any degree of acceptability would have been derived from a knowledgeable majority of respondents. For instance, the study found a high level of awareness of cervical cancer by the teachers which was higher than levels reported from Tanzania and Thailand. [21,22] The awareness of cervical cancer screening among the respondents in this study was higher than 35.56% reported in Onitsha, Anambra State and 52.8% reported in Owerri, Imo State both in Nigeria. [23,24] Even though, these studies were community-based studies, the study populations in Onitsha and Owerri were women only in contrast to this study which involved both male and female secondary school teachers. The much higher uptake of cervical cancer screening of 14.7% among the female secondary school teachers in this study suggests a higher appreciation of the usefulness of cervical screening among the women in this study compared to the 1.78%, 7.1% and 0.6% reported in previous studies in other parts of south east Nigeria [23,24,25].

The proportion of the respondents who knew that cervical cancer was caused by human papilloma virus in this study was equally high. This high level of knowledge of the aetiology of cervical cancer was an unexpected finding. This study did not explore the sources of information for the knowledge of the cause of cervical cancer, but it is entirely possible that recent public health workshops on this may have preceded our study. However the knowledge of the teachers on the target group for HPV vaccination lags behind this high knowledge of the aetiology of cervical cancer, still underscoring the need for health education and training of the secondary school teachers in this area on cervical cancer and its prevention.

On acceptability, the study found that a high proportion of teachers who were aware of cervical cancer would accept to give HPV vaccine to their daughters or to recommend same to their students or daughters of friends and relations. The level of acceptability of HPV vaccine among the teachers in this study was comparable to the acceptability level report in Tanzania [22]. The level of acceptability found in this study is encouraging and this high degree of willingness to recommend the vaccine could be an indication of the feasibility of enlisting

teachers to support the public health campaigns for increased uptake of the vaccine. In our society, secondary school teachers could wield substantial influence on adolescent girls second only to parental influence. By the results of this study, secondary school teachers in Abakaliki therefore have the potential to be useful in promoting the uptake of the HPV vaccine. This they can do by their dual capacity to educate adolescent girls and also advise their parents to vaccinate their daughters.

This study also found that being previously screened of cervical cancer among the female teachers influenced their acceptability of HPV vaccine. This agrees with a report from Taiwan where women with physical disabilities who previously had Pap smear, were more likely to accept HPV vaccine than their counterparts who did not. [26] The other factors that influenced the acceptability of HPV vaccine from this study were age of the respondents at ≥ 31 years, knowing the target group for HPV vaccination, and cause of cervical cancer. These suggest that the usefulness of teachers for promoting the uptake of the HPV vaccine may be improved by mass education of teachers on the epidemiology of cervical cancer.

4.1. Strengths and Weaknesses of the Study

The main strength of this study is a large proportion of secondary school teachers (20%) in Abakaliki city were sampled which could improve the external validity of the findings. The major weakness is the urban location of the study which effectively excluded teachers in rural communities of the study and could lead to bias by reflecting only the opinions of teachers in urban schools whereas majority of the Ebonyi State secondary school teachers reside in rural areas.

5. Conclusion

A good proportion of the secondary school teachers in Abakaliki were aware of the Human Papilloma Virus vaccine for preventing cervical cancer and about 7 in 10 of secondary school teachers who were aware of cervical cancer were favourably disposed to recommending HPV vaccination. Public health practitioners could therefore tap into this overwhelming favourable attitude by mobilizing teachers to influence adolescent girls and their parents towards increased uptake of the vaccine by adolescent girls in this area. Further studies on the acceptability of the HPV vaccine among teachers would be needed in the rural areas and other parts of Nigeria in order to develop the national picture of this potential structure for facilitating the uptake of this vaccine.

Conflict of Interest

There was no conflict of interest from this study.

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