



Uptake of Papanicolaou Smear Test and Human Papilloma Virus Vaccines among Clients in Family Planning Clinic in Port Harcourt, Nigeria

Authors

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Abstract

Background: Papanicolaou Smear test has been used to screen for pre-malignant lesions of the cervix and its application has reduced the incidence of cervical cancer by over 70% in the last five decades. Human Papillomavirus (HPV) is a known cause of cervical cancer. HPV vaccination is a primary prevention of cervical cancer.

Objective: To determine the uptake of Papanicolaou smear test and human Papillomavirus (HPV) vaccine among the clients of the family planning clinic of the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt.

Method: This was a prospective descriptive cross-sectional study conducted among 236 female clients of the family planning clinic in UPTH. Selected participants completed a self administered structured questionnaire capturing information on socio-demographic characteristics and uptake of Papanicolaou smear test and HPV vaccine. The data were entered into a spread sheet and analysed with Microsoft excel 2017 statistical software. The level of significance was set at $p < 0.05$.

Results: The mean age of the respondents in the study was 36.41 ± 6.01 with (148) 39.8% aged between 30-39 years and (174) 73.73% were multiparous. Forty four (18.64%) participants had done a pap smear and only 2.54% had received the HPV vaccine. There was a significant relationship between the level of education of participants and knowledge of PAP smear.

Conclusion: The uptake of PAP smear and HPV vaccine were very low. Education will improve the knowledge and hence uptake of PAP smear and HPV vaccine.

Keywords: Uptake, Papanicolaou Smear, Human Papillomavirus Vaccine, Port Harcourt.

Introduction

Cervical cancer is one of the leading causes of cancer worldwide, but to a large extent it is a preventable disease, because a persistent infection with high risk oncogenic forms of Human Papilloma virus (HPV) has been shown as the

aetiological agent of the disease and vaccines targeting these oncogenic forms have been used to significantly reduce the incidence of cervical cancer^[1- 3]. Cervical cancer accounts for 12% of all cancers worldwide and has shown varying age-standardized incidence rates; with high incidence

in the developing world like Nigeria where a study showed a 28.5 per 100,000 women incidence rate; this is mainly due to lack of effective gynaecological screening programs^[4]. Papanicolaou smear (Pap smear) has been the center piece of cervical cancer screening for over six decades and the screening programs have greatly reduced the rates of cervical cancer by up to 70% in developed world over this period^[5,6].

Since HPV is implicated in 70% of squamous cell carcinoma of the cervix, the use of vaccines against HPV has been shown to effectively prevent cancer of the cervix especially when a screening program is considered alongside the vaccination of young women^[7]. Cervarix and Gardasil are the two vaccines currently used as specific prevention of HPV infection^[1,7]. Until the middle of 2015, 60 (31%) of 194 countries around the world have included the HPV vaccine in their national immunization programme. With the exception of South Africa, Rwanda, Libya and a few African countries, Nigeria and many other African countries are yet to introduce or have no plan to introduce the vaccine in their national immunization program^[8].

In a lot of molecular biological and epidemiologic studies, a strong association between Human Papilloma Virus infections (particularly serotypes 16 and 18) and cervical cancer, which tend to occur more during the period of cervical epithelial metaplasia in sexually active adolescents has been established^[9]. Sexual behaviours like early sexual debut, multiple sexual partners, parity, smoking and low educational status has been shown to increase the risk of chronic HPV infection and the burden of cervical cancer^[10,11]. In Nigeria risky sexual behaviours are common among young people with sexual debuts at age as low as 16 years and with the practice of multiple sexual partners putting them at risk^[12,13]. Also some hypothesis claim that the use of hormonal contraceptives may increase the risk for HPV infection and development of cervical cancer. It has been reported that long term use of combined oral contraceptives is associated with increased

risk of HPV prevalence, but hormonal contraceptive use is not an independent risk factor for either high risk HPV infection or high-grade cervical intra-epithelial neoplasia (CIN)^[14-17]. Findings also show that Human Immunodeficiency Virus (HIV) positive women are at higher risk of developing abnormal cervical cytology, when compared to HIV negative women^[18,19].

Due to available evidence on the role of HPV screening in reduction of invasive disease and death due to cervical cancer, the Canadian Task Force on Preventive Health Care recommends routine cervical cancer screening for women from the age of 25 years^[20].

Human Papilloma Virus is one of the most common sexually transmitted infection and since 2006, there has been universal recommendation for vaccination of females of ages 9 to 26 years, but despite many females being at risk of HPV infection the uptake of the vaccine has been moderate to low due to various barriers of vaccination like knowledge gaps, concern of vaccine's adverse effect, cost, not knowing where to access the vaccine and cultural belief^[21-24]. Although the use of HPV vaccines and screening programs have shown good prospects in reducing the incidence of cervical cancer, Gardasil dissemination programs had been suspended in Andhra and Gujarat in India in 2010 mainly due to lack of information and this desire for information has not been limited to India only; this emphasizes on the importance of appropriate information on the uptake of the vaccines^[7].

The efficacy of Cervarix (bivalent vaccine against HPV 16 and 18) and Gardasil (tetravalent vaccine against HPV 6, 11, 16 and 18) against initial and persistent infection with HPV has been demonstrated from data gathered from several clinical trials, thus it is recommended to be administered to females aged 9 to 13 years or women who have not been infected by HPV, with schedules of 0, 1, 6 months for cervarix and 0, 2 and 6 months for Gardasil^[25].

Also the Gardasil-9 vaccine like the tetravalent Gardasil was approved in 2014 by Food and Drug Administration (FDA) in the United States, for use in both males and females aged 9 through 26 years, providing a wider coverage that includes type 31, 33, 45, 52, and 58 strains of the HPV virus^[26].

The general uptake of Pap smear screening and HPV vaccination varies from low to high depending on the population, being more in developed countries with HPV immunization programs and amongst people with good socio-economic status and access to reproductive healthcare facilities^[19,22,27].

In Nigeria similar studies show that awareness about Pap smear is low, being 30.8% among women attending a Nigerian tertiary health institution, while HPV vaccine awareness was found to be 25.3% among female nurses in a tertiary institution in Nigeria^[23,28]. Lack of awareness, absence of standard screening protocol, absence of the vaccines in national immunization programs, high cost of vaccine and low health insurance coverage have been major factors for low uptake of cervical cancer screening and vaccination in Nigeria^[29].

Method

This was a hospital based cross sectional descriptive study among women attending the family planning clinic of the University of Port Harcourt Teaching Hospital from January to March 2020. The sample size was determined with the Leslie Kish' formula^[30] for single proportions which states: $n = z^2 pq / d^2$. Where n = minimum sample size; z = standard normal deviate of 1.96 when the critical limit is set at 95% confidence interval in a two-tailed hypothesis test; p = awareness of existence of HPV vaccine among women attending gynaecology outpatient clinic according to a similar study done in Lagos by Kehinde S. Okunade^[31]; d = degree of accuracy desired or maximum allowable margin of error set at 5%; and q = 1- p. Hence $n = 235.53$

Bearing 5% attrition rate, data was collected from 248 participants. Using convenient sampling technique, a structured self administered questionnaire was done as clients present to the clinic. The data collected include socio-demographic characteristics; with the different categories of occupation modified from international standard classification of occupation^[32,33]. Also assessed were the risk factors for cervical cancer, knowledge and uptake of Papanicolou smear test and HPV vaccine among participants.

Statistical analysis of data was done using Chi-square test to compare categorical variable, and p-value < 0.05 was considered significant. Results were presented as means with standard deviation, rates and proportions in tables and figures.

Ethical approval was granted by the ethics committee of the hospital and participants signed the consent page of the structured questionnaire before participating.

Results

Two hundred and thirty six properly completed questionnaires out of the two hundred and forty eight questionnaires filled were analyzed. The mean age of the respondents in the study was 36.41 ± 6.01 with 39.8% (148) aged between 30-39 years; and 73.73% (174) were multiparous. The number of respondents residing in the urban region were 214 (90.68%), 228 (96.61%) were married, and 234 (99.15%) were Christians. Most of them, 162 (68.64%) had tertiary education. Table 1 shows the socio-demographic indices of the respondents.

The age at first sexual intercourse was less than 16 years in 78 (33.05%) of the respondents. The number of participants who had more than one sexual partner was 104 (44.07%), and only 2 (0.85%) of the respondents admitted cigarette smoking. Table 2 shows the risk factors for cervical cancer among participants, while Figure 2 shows their pattern of contraceptive use.

One hundred and fifty six (66.10%) of the respondents have heard of cervical cancer, 118

(50%) were aware of papanicolou smear, and forty four (18.64%) had done a pap smear.

Only 106 (44.92%) respondents think that women above 25 years should do a pap smear. Among the participants who had not done pap smear, 94 (48.96%) had not done it because they had no knowledge of the test.

A reasonable number of the participants, 204 (86.44%) agreed to do a pap smear if the test is explained to them. Of the respondents who said they will not do the test even if it is explained to them, cost was the main issue. Table 3 shows the respondents knowledge and uptake of cervical cancer and Papanicolou smear test. Figure 3 shows the source of information about Pap smear. Sixty (25.42%) of the participants have heard of Human Papilloma Virus and 40 (16.95%) said it is

sexually transmitted. Also only 40 (16.95%) participants have heard of the HPV vaccine. Table 4 shows the distribution of participant's knowledge of HPV and HPV vaccine, while Figure 4 shows the distribution of the sources of knowledge of the vaccine.

Only 6 (2.54%) respondents had vaccination against HPV. Among the 230 respondents who have not been vaccinated 137, (59.57%) said it was because they didn't know about the vaccine. Thirty two of the respondents (13.56%) said they will not take the vaccine even if they are enlightened and eligible. The distribution of uptake of the vaccine amongst respondents is shown on Table 5 and figure 5 shows the distribution of participants and reasons for not being vaccinated.

Table 1 Sociodemographic characteristics of participants

Variable	Frequency (N=236)	Percentage (%)
Distribution of Age (Years)		
20-29	37	15.68
30-39	121	51.27
40-49	74	31.36
50-59	4	1.69
Distribution of Parity		
Grandmultipara	36	15.25
Multipara	174	73.73
Primipara	26	11.02
Type of Residence		
Rural	22	9.32
Urban	214	90.68
Marital Status		
Single	8	3.39
Married	228	96.61
Religion		
Christianity	234	99.15
Islam	2	0.85
Highest completed Level of Education completed		
None	0	0.00
Primary	4	1.69
Secondary	70	29.66
Tertiary	162	68.64
Occupation		
Business	18	7.63
Civil servant	52	22.03
Formally employed in private sector e.g. banker	50	21.19
Skilled Artisan	42	17.80
House wife	40	16.95
Unemployed	34	14.41

Table 2 Risk Factors for Cervical Cancer among Participants

Variable	Frequency (N=246)	Percentage (%)
Age at marriage		
Less than 18 years	50	21.19
Greater than 18years	178	75.42
Not married	8	3.39
Age at First Sexual Intercourse		
Less than 16 years	78	33.05
Greater than 16 years	158	66.95
Have you had more than one sexual partner?		
No	132	55.93
Yes	104	44.07
Do you smoke cigarette?		
No	234	99.15
Yes	2	0.85

Table 3: Awareness and uptake of PAP smear

Variable	Frequency (N=236)	Percentage (%)
Have you heard of cervical cancer?		
No	80	33.90
Yes	156	66.10
Have you heard of Pap smear screening for Cervical Cancer?		
No	118	50.00
Yes	118	50.00
Do you think women above 25 years should have pap smear?		
Yes	106	44.92
No	130	55.08
Have you done a Pap smear screening for Cervical Cancer?		
Yes	44	18.64
No	192	81.36
If you have done a Pap smear, how many times?		
Three or more	6	13.64
Twice	6	13.64
Once	32	72.73
Total	44	100.00
Reasons for not doing Pap smear		
No prior access to health facility providing pap smear service.	5	2.60
No medical Advice	46	23.96
Cost	47	24.48
No Knowledge	94	48.96
Total	192	100.00
How often should you do a Pap smear?		
Every 6 months	24	10.17
Yearly	10	4.24
Every 3 years	34	14.41
No idea	168	71.19
If pap smear screening is well explained to you, will you consider doing the test?		
No	32	13.56
Yes	204	86.44
If you will not do Pap smear, after being educated why?		
I won't get the disease	8	25.00
Personal belief	10	31.25
Cost (it's expensive)	14	43.75

Figure 1

Sources of knowledge about PAP smear

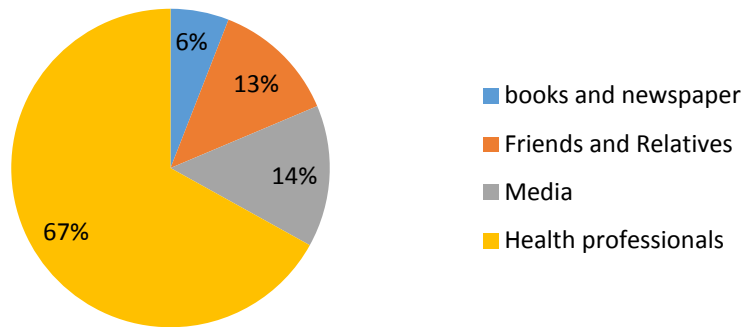


Table 4 Knowledge of Human Papilloma Virus and Vaccine

Variable	Frequency (N=236)	Percentage (%)
Have you heard of Human Papilloma Virus?		
Yes	60	25.42
No	176	74.58
Is HPV sexually transmitted?		
No	36	15.25
Yes	40	16.95
I don't know	160	67.80
Can HPV Cause Cervical Cancer?		
No	30	12.71
Yes	38	16.10
I don't know	168	71.19
Have you heard of HPV Vaccine?		
Yes	40	16.95
No	196	83.05
Can HPV Vaccine Prevent cervical cancer?		
No	26	11.02
Yes	36	15.25
I don't Know	174	73.73
Do you know where you can get HPV vaccine?		
Yes	32	13.56
No	204	86.44

Figure 2

Sources of Knowledge about HPV and HPV Vaccine

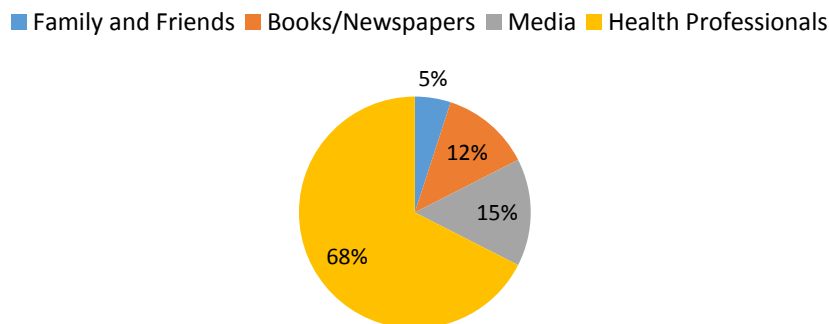
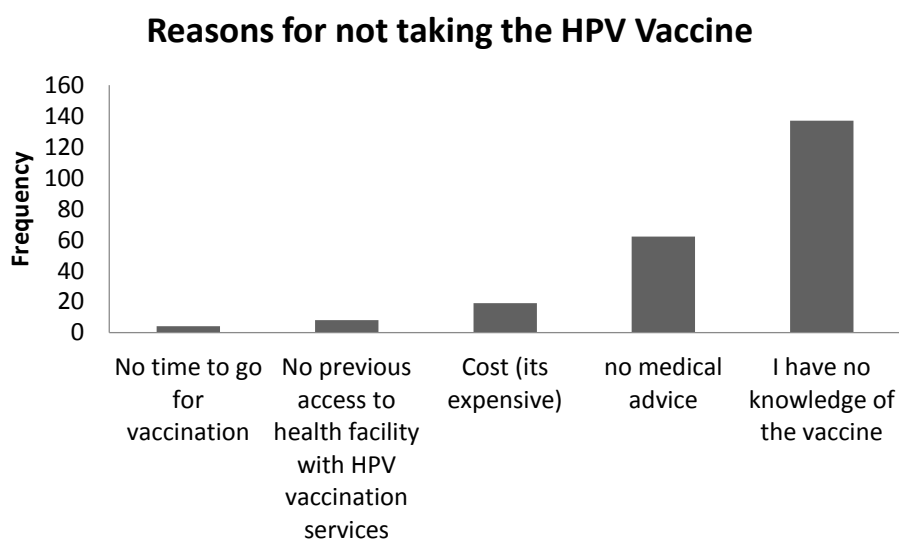


Table 5: Uptake of HPV Vaccine

Variable	Frequency (N=236)	Percentage (%)
Have you been Vaccinated against HPV?		
Yes	6	2.54
No	230	97.46
If you are enlightened and eligible for the vaccine, will you get vaccinated?		
No	32	13.56
Yes	204	86.44
If you will not take the vaccine, why?		
Cost (it's expensive)	6	18.75
I won't get the disease	9	28.13
Personal belief	17	53.13

Figure 3



A statistical analysis was performed to find relationship between levels of education and participant's awareness of PAP smear test and HPV vaccine. The significance of these

relationships was determined by using Pearson's Chi-square test of independence. The results are shown in tables 6 and 7 below.

Table 6. Relationship between level of education and awareness of PAP smear screening test among participants

Variables	Have you heard of PAP smear screening?			χ ²	P
	Yes N=118 n(%)	No N=118 n(%)	Total N = 236 n(%)		
Highest Level of Education attained.					
Primary	0 (0.0)	4 (100.0)	4 (1.7)		
Secondary	18 (25.7)	52 (74.3)	70 (29.7)		
Tertiary	100 (61.7)	62 (38.3)	162 (68.6)	27.428	*0.000001107

*Statistically significant at p < 0.05

Table 7: Relationship between level of education and awareness of HPV vaccine among participants

Variables	Have you ever heard of HPV vaccine?			χ^2	P
	Yes N=40 n(%)	No N=196 n(%)	Total N = 236 n(%)		
Highest Level of Education attained.					
Primary	0 (0.0)	4 (100.0)	4 (1.7)		
Secondary	10 (14.3)	60 (85.7)	70 (29.7)		
Tertiary	30 (18.5)	132 (81.5)	162 (68.6)	0.775	0.678895

Similar test above did not show any significant relationship between the level of education of participants and their awareness of HPV vaccine.

Discussion

The use of cervical cancer screening methods especially papanicolou smear and vaccination against Human Papilloma Virus has been shown to be strong preventive measures for cervical cancer among women in many countries^[4,23,31]. The knowledge of cervical cancer, the screening and vaccination is critical to the uptake of these preventive measures in a community with identifiable risk factors. This study was carried out in a unit that offers reproductive health care service with information on diseases affecting the female reproductive health easily disseminated. In this study, the awareness of cervical cancer was above average; the proportion (66.10%) was higher than that found in women dwelling in an urban slum in Lagos, Nigeria but similar to that in a hospital based study in Ethiopia^[4,31]. However the knowledge of Human Papilloma Virus and mode of transmission of HPV was lower; but this fraction (25.42%, 16.95%) was better than the study done among undergraduates in Lagos where 97% had poor knowledge of the virus^[27].

The awareness of Papanicolaou smear test and HPV vaccine were 50.00% and 15.25% respectively. The level of education had a significant effect on the knowledge of participants on Papanicolaou smear test but did not affect the knowledge of HPV vaccine. This effect of educational status on knowledge of cervical cancer and screening was similar to that found in a hospital based study in Ethiopia[34]. Even though the study population was mainly urban in this

study, the knowledge of the participants on PAP smear was higher than what was found in a study in a North Western Nigerian tertiary institution like ours^[35]. However the awareness for HPV vaccine was low and similar to a high level of lack of awareness of the vaccines among women in an urban community in Lagos Nigeria^[36]. Also in this study 71.19% of the respondents had no idea of the correct basic knowledge of how often a PAP smear should be done.

The uptake of PAP smear test in this study was poor (18.64%) and was similar to an uptake of 19.10% found among women attending a tertiary hospital in North western Nigeria^[35]. This similarity could be attributed to the similarity of population of patients in a tertiary institution, as these levels of uptake were higher than what was found in a different non-hospital urban neighbourhood in Lagos^[37]. Of all the participants in this study that had done a PAP smear most have done it only once, even though the average age of respondents was 36.41± 6.01SD. This study also identified various reasons respondents did not do PAP smear to include lack of knowledge (48.96%), cost (24.48%), no medical advice (23.96%) and no previous access to health facilities carrying out PAP smear (2.60%), which was similar to reasons found in another similar study in northern Nigeria^[35]. However the willingness to do a PAP smear was high among respondents (86.44%), while those who said they would not do the test gave reasons like cost, personal beliefs and firm belief that they will not

get the disease, this was also found in similar studies^[9,34,37].

The participants showed a very poor basic knowledge of the possibility of HPV causing cervical cancer, as 71.19% had no idea it could cause cervical cancer.

The uptake of the HPV vaccine was abysmally low in this study; the proportion 2.54% was similar to 2.60% uptake which was observed in a study among female undergraduates in Lagos^[27]. However 13.56% of participants said they know where they can get vaccinated. The most common factors for non utilization of the vaccine was lack of knowledge amongst participants, no medical advice, cost, no access to health facility and lack of time to go and get vaccinated. Similar varying factors were noticed in the above study in Lagos^[27]. Another reason for the low uptake found in this study could be due to lack of government organized program on HPV vaccination. Contrarily, similar studies in developed countries like United States and Germany reported comparatively higher uptake of HPV vaccines of 62.4% and 53% respectively^[38,39]. Most participants would get vaccinated with proper education while 13.56% will still not take the vaccine because of cost, personal belief and because they feel they will not get the disease. Generally, most studies reported that most common barriers to uptake of HPV vaccination were mostly due to insufficient information and high cost of the vaccine^[23,27,29,31,38,39]. Overcoming these barriers should be the target of interventions by increasing knowledge of HPV vaccine among young persons and also females of reproductive age with possible vaccination subsidization in Nigeria.

Conclusion

Although the awareness of PAP smear was average, that of HPV vaccine was significantly low. The uptake of PAP smear test and HPV vaccines were equally low. This was attributed mainly to the poor knowledge/awareness of PAP smear and HPV vaccine.

Recommendation

These findings highlight the need to use the human resources at the outlets of the reproductive health care services to provide educational/sensitisation interventions. Also there is need for government's intervention initiatives to help improve awareness, reduce cost and improve access to these effective preventive measures of screening and vaccination for cervical cancer.

Consent: All the respondents in this study gave written informed consent.

Competing Interest: authors declare that there is no competing interest among them.

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