



ORIGINAL ARTICLE

Effect of Training on Knowledge about Cervical Cancer and Human Papilloma Virus Vaccine among Health Care Personnel in Benin City

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ABSTRACT

Background: Although the HPV vaccine is available for a fee in Nigeria it is not yet in the National Programme on Immunization (NPI) which is free. Health care workers can play an important role in improving uptake of the vaccine and in advocating for its inclusion in the NPI. However, this role may be limited by lack of knowledge. This study assessed the effect of training on health care workers' knowledge of HPV, its relationship with cervical cancer and the role of HPV vaccine in prevention.

Methods: This quasi-experimental study examined the responses to pre and post test evaluation of the knowledge and practice of health care workers from Benin City with regards to HPV, cervical cancer and HPV vaccines at a workshop organized to create awareness on the subject matter.

Results: Of the 53 health care workers at the training, 46 (85%) knew that HPV was the causative agent of cervical cancer while only 13 (28.9%) and 15 (32.6%) knew that it was associated with oral and vaginal cancer, respectively. Majority of participants had heard about the HPV vaccine but only 15 (30.6%) had encouraged its use and 7 (14.3%) had prescribed it. Post test result showed marked improvement in most areas evaluated.

Conclusion: The less than satisfactory knowledge of health care workers about HPV and its relationship with anogenital cancers was markedly improved by training. Training of health care workers should be done to address the dearth of knowledge prior to the deployment of the vaccine nationally.

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INTRODUCTION

Human Papilloma Virus (HPV) infection is one of the commonest sexually transmitted infections globally.¹ At least 50% of sexually active females will acquire the infection in their life time.² While most of the infections are asymptomatic, transient and clear spontaneously, persistent infection with certain genotypes have been associated with lesions.¹ HPV has over 100 genotypes which

are classified as high risk and low risk based on their propensity to cause malignant lesions.^{1,2} About 70% of cervical cancer is caused by genotypes 16 and 18 which are considered high risk while types 6 and 11 which are associated with genital warts are considered low risk.^{1,3} Other cancers that have been associated with HPV include oral, penile, anal, vulval and vaginal cancers.³ Cervical cancer is the commonest gynaecological

cancer worldwide affecting 500,000 women annually, most of whom are from low income countries.⁴ The age standardized rate of cervical cancer in Nigeria is reported as 34.5 per 100,000 women suggesting high burden of both the HPV and cervical cancer.⁵ Known risk factors for acquisition of the HPV and development of cervical cancer have been recognized and these include early sexual debut, multiple sexual partners, smoking, history of sexually transmitted diseases, multiparity, immunodeficiency and long term use of oral contraceptives.⁶

Several strategies have been deployed to prevent cervical cancer. These include health education, regular screening for cervical cancer using the Papanicolaou (PAP) smear and more recently primary prevention using the HPV vaccine. There are three types of the HPV vaccine – the bivalent (against genotypes 16 and 18), the quadrivalent (against genotypes 6, 11, 16 and 18) and the nonavalent (against 9 genotypes).⁷ The HPV vaccine has not yet been deployed in the National Programme on Immunization (NPI) in Nigeria but it is available for a fee. Health care professionals have been identified as important in driving the uptake of health interventions.⁸ Thus their knowledge and attitudinal disposition to the HPV vaccine will be important in creating demand for the vaccine. They are also in a good position to advocate for the vaccine to be deployed in the NPI. Several studies have evaluated health care workers knowledge and attitude towards HPV in Nigeria.^{1, 4, 9} Many of these studies tend to target female health care workers both as potential recipients of the vaccine and also as administrators of the vaccine; majority of administrators are nurses who are mostly female.^{1, 9} Some of these studies highlighted poor knowledge about HPV vaccines.^{1, 4, 9}

The Institute of Child Health, University of Benin which regularly disseminates health

information, decided to close the information gap by organizing a workshop for health care workers on cervical cancer and HPV vaccine. The pretest and post-test evaluations of the workshop participants are the subject of this study. The aim of this study was to assess the effect of training on the knowledge of the health care workers about HPV infection, cervical cancer and its prevention.

METHODOLOGY

The Institute of Child Health in collaboration with the Department of Child Health, University of Benin, Benin City, organized a workshop on HPV vaccines and cervical cancer for health care workers in Benin City in November 2015. Participants were drawn from the four major hospitals (University of Benin Teaching Hospital, Central Hospital, Faith Mediplex and St Philomena's Hospital) in Benin City in addition to other private health facilities following receipt of letters of invitation to attend the workshop. Intended participants were doctors, nurses, pharmacists and laboratory scientists. All those who attended the seminar are the subject of this quasi-experimental study (one group pretest-post-test design). Benin City which is largely urban is the capital of Edo State and has a population of 1,085,676. There are 318 registered hospitals/clinics in Benin City. A set of pretest questions were administered before the workshop took place and the same set of questions were administered at the end of the workshop. Lectures were given over a two hour period which covered the subject areas of the HPV, its genotypes, prevalence, risk factors, cervical cancer and its prevention including HPV vaccination.

The pretest questions also sought demographic information such as designation, age and number of years since graduation. Verbal consent was obtained from the participants. The questionnaires had no

identifiers and the pre- and post-test questionnaires were not linked for a given individual. Responses were coded and entered into a Statistical Package for Social Sciences (SPSS) version 16 spread sheet. Analysis was done using the same software. The distribution of the respondents according to their responses to knowledge, attitude and practice questions were presented as simple proportions. Continuous variables such as age were presented as means with standard deviations. Comparison of responses between pre and post workshop was done using Fishers Exact test and Chi Square test as appropriate. Level of statistical significance was set at $p < 0.05$. Ethical clearance for the study was obtained from the Research and Ethics Committee of the College of Medical Sciences, University of Benin. (REC Exemption No: CMS/REC/2017/001)

RESULTS

There were 53 respondents who answered the pretest questions 31 (58.5%) doctors, 21 (39.6%) nurses and 1 (1.9%) laboratory scientist) while 42 answered the post test questions 20 (47.6%) doctors, 21 (50.0%) nurses and 1 (2.4%) laboratory scientist). Some 11 (20.8%) did not stay till the end of the workshop/did not respond to the post test questions. Among the pretest respondents, there were 16 (30.2%) males and 37 (69.8%) females while there were 10 (23.8%) males and 32 (76.2%) females among the post-test respondents. The age distribution of the respondents is shown in Table 1. The mean ages of the respondents in the pre- and post-tests were 39.8 ± 9.4 and 40.3 ± 9.7 years, respectively.

Knowledge about cervical cancer

Majority of respondents 50 (94.4%) knew that multiple sexual partners is a risk factor for cervical cancer. Knowledge about other risk factors is as shown in Table 2. With regards to

symptoms of cervical cancer, the most recognized symptom was post coital bleeding. Following training all respondents correctly identified risk factors and symptoms of cervical cancer. The difference between pre and post training responses in correctly identifying risk factors and symptoms was statistically significant ($p < 0.0001$) except for multiple sexual partners in which the difference was not significant. In terms of prevention, 32 (60.4%) of respondents recognized that primary prevention can be achieved with the HPV vaccine but 11 (20.8%) erroneously believed that PAP smears were not necessary if an individual had received the HPV vaccine while only 16 (30.2%) affirmed that Pap smears were necessary even after receipt of HPV vaccines. Some respondents 34 (64.1%) correctly identified that Pap smear should be done 3 yearly for sexually active females. All respondents at the end of the workshop recognized HPV vaccine as a primary prevention tool and that Pap smear should be done three yearly. The improvement in the post workshop responses was statistically significant ($p < 0.0001$).

Knowledge about HPV

Forty-six (86.8%) respondents knew that HPV was responsible for cervical cancer while 13 (24.5%) and 15 (28.3%) knew that it was also implicated in oral and vaginal cancers, respectively. These proportions significantly increased following the training ($p < 0.0001$). With regards to cancer causing HPV genotypes, 32 (60.4%) and 15 (28.3%) of respondents knew that HPV 16 and 18 as well as 31 and 45 were causative of cervical cancer.

Seven (13.2%) of respondents erroneously believed that HPV 6 and 11 were also causative of cervical cancer and this proportion statistically significantly increased after the workshop ($p < 0.0001$).

Table 1: Sociodemographic characteristics of participants

Socio-demographic characteristic	Frequency (n=53)	Percent
Gender		
Male	37	69.8
Female	16	30.2
Age group (years)		
≤29	7	13.2
30-39	13	24.5
40-49	17	32.1
≥50	10	18.9
Not indicated	6	11.3
Professional characteristics		
Doctors		
Consultants	7	22.6
Residents	17	54.8
House officers	5	16.1
Medical Officers	2	3.8
Nurses		
NO1 & NO11	4	19.0
SNO & PNO	8	38.1
ACNO & CNO	7	33.3
Not indicated	2	9.5
Laboratory Scientist	1	4.8
Numbers years since graduation		
≤9	16	30.2
10-19	16	30.2
20-29	7	13.2
≥30	6	11.3
Not indicated	8	15.1

Knowledge about HPV Vaccine

Majority of the respondents 46 (86.8%) had heard about the HPV vaccine Prior to the training less than 30% of respondents knew of the different types of HPV vaccines but this increased to 100% (42) at the end of the training ($p<0.0001$). With regards to indications for the HPV vaccine, 41 (77.4%) agreed that it should be administered to young girls prior to sexual debut whereas 27 (50.9%) thought it should be given to all sexually active females. Only 27 (50.9%) of respondents knew that 3 doses of the vaccine are required while 35 (66.0%) knew that the recommendation is that the HPV should be administered from the age of 9 years.

Following the workshop, all respondents 42 (100.0%) agreed that the vaccine should be given to young girls prior to sexual debut. They also knew the correct recommendation of 3 doses of the vaccine and that it should be administered to girls from the age of 9 years. This increase in knowledge was statistically significant ($p<0.0001$). However, 21 (50.0%) still felt that it should be given to all sexually active females and this was not statistically significantly different from the pre workshop proportion ($p=1.000$).

Correct identification of the different side effects of the vaccine is shown in Table 3. More participants 30 (56.6%) recognized pain, swelling and redness at injection site as side effects of the HPV vaccine compared to other symptoms (fever, headache, dizziness, nausea, vomiting and diarrhoea) although the differences were not statistically significant, $\chi^2=4.854$, $p=0.883$. Post training, all respondents 42 (100.0%) correctly identified the side effects of the vaccine. The increase in the proportion correctly identifying side effects was statistically significant ($p<0.0001$). A significant proportion of respondents did not know that the HPV vaccine was protective against genital warts 29 (54.7%) and penile cancer 40 (75.5%) but at the end of the workshop all respondents recognized the protective ability of the vaccine against genital warts and penile cancer $p<0.0001$. Majority 40 (75.5%) of the respondents did not know that the HPV vaccine was expensive but this awareness increased to 42 (100%) at the end of the workshop ($p<0.001$).

DISCUSSION

This study shows that prior to the seminar, there was a significant knowledge gap that could negatively impact the ability of the health care workers to effectively advocate for the use of the HPV vaccine. Although many respondents were knowledgeable about

Table 2: Knowledge of participants about cervical cancer and other HPV associated cancers

Knowledge Domains	Respondents who gave a yes response		p value
	Pretest n=53 n (%)	Post test n=42 n (%)	
Common features of cervical cancer			
Post coital bleeding	50 (94.3)	42 (100.0)	0.2500
Irregular vaginal bleeding	39 (73.6)	42 (100.0)	<0.0002
Painful coitus	31 (58.5)	42 (100.0)	<0.0001
headache	4 (7.6)	0 (0.0)	0.1271
Risk factors for cervical cancer			
Multiple sexual partners	51 (94.4)	42 (100.0)	0.5015
Smoking	24 (45.3)	42 (100.0)	<0.0001
Long term use of oral contraceptives	16 (30.2)	42 (100.0)	<0.0001
Not breastfeeding	10 (18.9)	42 (100.0)	<0.0001
Cause of Cervical cancer			
HPV 16 and 18	32 (60.4)	42 (100.0)	<0.0001
HPV 6 and 11	7 (13.2)	21 (50.0)	<0.0001
HPV 31 and 45	15 (28.3)	42 (100.0)	<0.0001
HPV-associated cancers			
Oral cancer	13 (24.5)	41 (97.6)	<0.0001
Vaginal cancer	15 (28.3)	42 (100.0)	<0.0001
Cervical cancer	46 (86.8)	42 (100.0)	0.0164
Condyloma acuminata	15 (28.3)	37 (88.1)	<0.0001

Table 3: Knowledge of participants about HPV Vaccine

Knowledge domains	Respondents who gave a yes response		p-value
	Pretest n=53 n (%)	Post test n=42 n (%)	
Use of HPV Vaccine			
I have heard about it	46 (86.8)	42 (100.0)	0.0164
I have encouraged my patients to receive it	15 (28.3)		
I have prescribed if for my patients	7 (13.2)		
Types of HPV Vaccines			
Bivalent	14 (26.4)	42 (100.0)	<0.0001
Tetravalent	11 (20.8)	42 (100.0)	<0.0001
Nonavalent	2 (3.8)	42 (100.0)	<0.0001
HPV vaccine administration			
It is given as a single shot	6 (11.3)	0 (0.0)	<0.0325
It is given in 3 doses	27 (50.9)	42 (100.0)	<0.0001
It is best given to young girls prior to sexual debut	41 (77.4)	42 (100.0)	<0.0009
It is best given to all sexually active females	27 (50.9)	21 (50.0)	1.0000
It is given from the age of 9 years	35 (66.0)	42 (100.0)	0.0001
Concerning Pap Smear			
Pap smear screening is not necessary after receipt of HPV vaccine	11 (20.8)	21 (50.0)	0.0042
Pap smear should be done 3 yearly as from age 20 for sexually active females	34 (64.1)	42 (100.0)	<0.0001
Uses of HPV vaccine			
HPV vaccine is a primary prevention tool	32 (60.4)	42 (100.0)	<0.0001
Protects against genital warts	4 (45.3)	42 (100.0)	<0.0001
Protects against penile cancer	13 (24.5)	42 (100.0)	<0.0001
Side effects of HPV vaccine			
Pain, swelling and redness at injection site	30 (56.6)	42 (100.0)	<0.0001
Mild fever, headache, dizziness	25 (47.2)	42 (100.0)	<0.0001
Nausea, vomiting, diarrhoea	19 (35.9)	42 (100.0)	<0.0001
Runny nose	6 (11.3)	0 (0.0)	0.0325

cervical cancer in terms of its general cause and symptoms, a significant proportion were not knowledgeable about risk factors beyond the role of multiple sexual partners. The finding of poor knowledge of risk factors has been identified in previous works both in Nigeria and elsewhere.¹⁰⁻¹² One of the fundamental requirements for the prevention of a disease is the knowledge about the various risk factors for the disease.

Beyond knowing that genotypes 16 and 18 were causative of cervical cancer, the knowledge about the roles of other HPV genotypes was low. Most previous studies on knowledge in Nigeria did not evaluate knowledge about the HPV genotypes.^{1, 4, 9} It is important to know about the various cancer causing HPV genotypes as this information is needed to understand and explain the need/indications and scope of the different types of HPV vaccines. The respondents also exhibited poor knowledge about other diseases associated with the HPV. Information about the spectrum of diseases associated with the HPV is important in explaining the advantages of the HPV vaccine in general and the advantages of different types of HPV vaccines. A previous Nigerian study that assessed knowledge of other HPV associated diseases restricted this to warts and penile cancer and the knowledge about this was low as found in this study.⁴

Prevention of cervical cancer involves different approaches. HPV vaccine is a primary prevention tool and only two-thirds of respondents recognized it as such. It is generally agreed that HPV vaccine is best given to young girls prior to their sexual debut and majority of the respondents knew this. This is similar to findings in other Nigerian studies in which majority of respondents favoured administering the vaccine to young girls.^{1, 4} There are some studies which have reported resistance to giving the vaccines to

adolescent girls and the reasons included fear of encouraging initiation of sexual activity.^{1, 8} About half of the respondents felt the vaccine should be given to all sexually active females and this proportion did not change significantly after the workshop. The problem with such an approach is the fact that the vaccine would be administered to those who may have already acquired the virus and for whom the vaccine will not be beneficial. This approach may not be cost effective. However, infected sexually active females may not have acquired the HPV genotypes covered by the vaccine. In such instances receipt of the vaccine may be beneficial in that it will provide protection against the vaccine serotypes.

With regards to the role of Pap smear after receipt of the vaccine, about a fifth of participants felt that this was not required after receipt of the vaccine and this proportion increased after the workshop. Such erroneous belief could lead to a decline in uptake in Pap smear testing when the HPV vaccine becomes widely available. It is important that health care workers understand the roles of Pap smear and HPV vaccine in the prevention of cervical cancer. The HPV vaccine is not 100% efficacious and none of the yet available vaccines covers all cervical cancer causing genotypes.^{13, 14} Thus receipt of the vaccine is not totally protective and the Pap smear will continue to be a relevant tool for early detection of pre-cancerous lesions.

Majority of the respondents had heard of the HPV vaccines. This is higher than in earlier studies carried out in 2008 and 2011 suggesting an increase in the availability of information on the HPV vaccines over time.^{1, 9} In this study only about a third of the participants had encouraged its use among their patients and fewer still had ever prescribed it. This is lower than findings in Enugu in which almost fifty percent of

married respondents with adolescent daughters had had them immunized.⁹ It is important that health care workers should encourage the use of the HPV vaccine. In health care settings, it has been recognized that the advice of health care workers with regards to HPV vaccine was a significant determinant of uptake of the vaccine.⁸ The dearth of knowledge about important aspects of the HPV vaccine may have been responsible for the observations in the respondents with respect to the use of the vaccine. Previous studies have shown that health care workers are reluctant to prescribe the HPV vaccine when they have limited knowledge about its efficacy and safety.^{1,4}

The workshop met its intended objectives of improving knowledge and raising awareness of participants about cervical cancer and the HPV vaccine as evidenced by the improvement in most aspects. This study is limited by the small number of participants and the fact that the pre and post tests were not linked. It is concluded that the knowledge about HPV among health care workers is low and there should be concerted efforts and plans to address the dearth of knowledge prior to the deployment of the vaccine. Areas of emphasis should include the roles of the vaccine and the Pap smear so that deployment of the vaccine will not result in a reduction in the uptake of Pap smear screening. Pre-service training and in-service training are suggested strategies for achieving this objective.

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