

# Acceptability of human papilloma virus vaccine and cervical cancer screening among female health-care workers in Enugu, Southeast Nigeria

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## Abstract

**Background:** Cervical cancer, a leading cause of cancer deaths in women in developing countries can be prevented primarily by vaccinating adolescent girls and women against infection by the human papillomavirus (HPV) before their first sexual exposure, and secondarily through screening and treatment of identified precancerous lesions.

**Aim:** To determine the awareness and acceptability of the HPV vaccine and screening for cervical cancer among female health-care workers in Enugu, southeastern Nigeria.

**Materials and Methods:** Questionnaires were administered to a cross-section of 177 female health-care workers selected systematically from the University of Nigeria Teaching Hospital (UNTH), Enugu, Nigeria. Statistical analysis was both descriptive and inferential at 95% confidence level using the Statistical Package for Social Sciences (SPSS) computer software version 16. A *P* value of less than 0.05 was considered statistically significant.

**Results:** The awareness of screening for cervical cancer (91%) was significantly higher than that of the HPV vaccine (62.7%) [odds ratio (OR): 0.17; 95% confidence interval (CI): 0.09–0.30]. However, the acceptability rate of the HPV vaccine (91.0%) was significantly higher than that of cervical screening (71.4%) (OR: 4.04; 95% CI: 1.94–8.42). Only 25 (14.1%) of the health-care workers had done cervical screening, but 30 (49.2%) of the 61 respondents with adolescent daughters had immunized their daughters with the HPV vaccine. Although no reason was given for the low participation in cervical screening, cost and availability of HPV vaccine was a major deterrent for the latter.

**Conclusion:** With more public enlightenment, available and affordable HPV vaccine appears to hold the key for prevention of cervical cancer in developing countries where the burden is high.

**Key words:** Acceptability, health workers, HPV vaccine, Nigeria

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## Introduction

Cervical cancer has claimed the lives of many women worldwide and it is estimated that about 80% or more of the world burden of cervical cancer is in the developing countries.<sup>[1,2]</sup> This preventable cancer has a long precancerous stage and during this interval, screening could be done, and any precancerous lesions identified could be adequately treated to prevent progression to the invasive cancer stage.<sup>[3]</sup> Human

papilloma virus (HPV), a sexually transmitted virus has been implicated as the causative agent. The new prevention strategy for cervical cancer is directed at immunization against this HPV infection prior to the first sexual exposure as a form of primary prevention or to screen for evidence of preinvasive lesions of the cervix as a form of secondary prevention.

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The Papanicolaou (Pap) smear has been the screening tool commonly used and it has reduced the incidence of cervical cancer in the developed countries by over 70%.<sup>[2,4]</sup> However, in the developing world, where the resources are very limited and screening centers are either not available or are sparsely distributed, the screening programs have been unsuccessful and ineffective in reducing the disease burden.<sup>[5]</sup> This is further compounded by the fact that both the women and health-care providers in these poor-resource countries often lack information about cervical cancer as a disease entity, its causative agent, and how cost effective it is to prevent it.<sup>[2]</sup>

In the recent past, the discovery of the HPV vaccine has transformed the prospects for reducing the incidence of cervical cancer on a global scale.<sup>[6]</sup> As HPV is sexually transmitted and most women become infected within three years of commencement of sexual activity, the vaccine if given before the first sexual exposure, will help develop immunity against the virus prior to the exposure. The vaccines have been found to have remarkable efficacy, achieving more than 98% protection in randomized clinical trials against cervical intraepithelial neoplasia (CIN) grades 2 and 3 and adenocarcinoma *in situ*.<sup>[7]</sup> The effectiveness of a vaccine delivery program depends largely upon the awareness of the health-care providers about the vaccine and their attitude in terms of acceptability of the vaccine.<sup>[8]</sup> These factors influence the willingness or readiness of the health-care providers to recommend the vaccine to others.<sup>[8]</sup> This study is therefore meant to assess the awareness and acceptability of the cervical cancer vaccine and that of the Pap smear among female health-care workers.

## Materials and Methods

### Study area

Enugu State is one of the five states in the Southeast geopolitical zone of Nigeria, and its capital city is Enugu. It lies within the West African rainforest region (latitude: 5°55' and 7°10' N and longitude: 6°50' and 7°55' E), through a land area of approximately 8,000 km<sup>2</sup>.<sup>[9]</sup> According to the 2006 population census, the Enugu State and Enugu metropolis have a population of 3,257,298 and 722,664, respectively with a female to male ratio of approximately 1:1.<sup>[10]</sup> The state has an annual growth rate of population of about 2.28% and the population is predominantly Igbo with pockets of other tribes.<sup>[9]</sup>

The UNTH, Enugu is the pioneer teaching hospital in southeastern Nigeria. It is owned by the federal government of Nigeria and is currently located at Ituku-Ozalla, at the outskirts of Enugu.

### Study design and sample selection

This is a questionnaire-based cross-sectional survey of female health-care workers at the UNTH, Enugu, southeastern Nigeria. The study took place between 3 July and 6 November,

2009. The nonprofessional female health-care workers such as the hospital attendants, orderlies, cleaners, and so on were excluded from the study. The administrative health-care workers were also excluded. Using an acceptability rate of 88% for the HPV vaccine obtained in a previous study from Gaborone, Botswana,<sup>[11]</sup> at a confidence level of 95% and error margin of 5%, the calculated minimum sample size was 162. However, a sample size of 200 was used for the study. The hospital had a record of 801 professional female health-care workers comprising 204 female doctors, 369 nurses, 88 laboratory scientists, 64 pharmacists, 40 dieticians, and 36 physiotherapists. A sampling frame of each group of the above-mentioned health-care workers was first obtained and a multistage sampling technique was employed to select the sample of 200 respondents from the various groups. In the first stage, a stratified sampling method was used to assign the sample size of 200 to the six groups of female health-care workers as follows: 51 to the group of doctors, 92 to the group of nurses, 22 to the group of laboratory scientists, 16 to the group of pharmacists, 10 to the group of dieticians, and 9 to the category of physiotherapists, proportionately. In the second stage, the systematic sampling technique was employed to select the required sample size of 200 from the various groups of health-care workers, first by using a simple random sampling method to select one name from the first four names in a prepared sampling frame of each group of workers, and thereafter, selecting every fourth name in the prepared sampling frame of each group of workers starting from the first name already selected by the simple random sampling method.

Following individual counseling of eligible participants, self-administered, structured and pretested questionnaires were distributed to the consenting selected women by trained medical interns. Ethical clearance for the study was obtained from the Institutional Review Board of the UNTH, Enugu.

Data sought included sociodemographic characteristics of respondents, awareness and acceptability of the HPV vaccine and the Pap smear, as well as uptake of the HPV vaccine by the adolescent daughters of the respondents and uptake of the Pap smear by the respondents themselves. The questionnaire was pretested among 15 health-care workers at the Enugu State University Teaching Hospital, Parklane, Enugu.

Data analysis was both descriptive and inferential at the 95% confidence level using the SPSS software version 16.0 [SPSS Inc., Chicago, Ill.]. Proportions were compared with the Pearson chi-squared test. A *P*-value of less than 0.05 was considered statistically significant.

Acceptability of HPV vaccine was defined as the willingness of the health-care worker to recommend the vaccine to her adolescent daughters, other adolescents, and other sexually unexposed young women, whereas acceptability of

screening for cervical cancer was defined as the willingness of the health-care worker to do the Pap smear herself and to recommend it to other women singly or during health-care talk among female folk.

## Results

Of the 200 questionnaires distributed, 177 were retrieved, giving a response rate of 88.5%. The mean age of respondents was  $30.6 \pm 2.7$  years (range: 20-65). One hundred and seventy (96%) were of the Ibo tribe. The seven others were made up of 3 (1.7%) Yoruba, 2 (1.1%) Idomas, 1 (0.6%) Igala, and 1 (0.6%) Urhobo. One hundred and six (59.9%) respondents were married, whereas 81 (40.1%) were single. Forty-five (25.4%) were doctors, 81 (45.8%) were nurses, 19 (10.7%) were laboratory scientists, 14 (7.9%) were pharmacists, 9 (5.1%) were dieticians, and 9 (5.1%) were physiotherapists.

One hundred and fifty-two (85.9%) were aware of cervical cancer and that it was preventable, whereas 25 (14.1%) were not aware that the cancer was preventable. One hundred and forty-nine (84.2%) knew that HPV was the causative agent implicated in cancer of the cervix and one hundred and thirty-eight (78.0%) knew that HPV was sexually transmitted.

One hundred and eleven (62.7%) respondents were aware of the HPV vaccine and 101 (91%) of them were willing to recommend it to their adolescent daughters, other adolescents, or sexually unexposed young women. Of the 111 respondents aware of the HPV vaccine, 96 were married, of whom 61 had adolescent daughters. Thirty (49.2%) of the 61 married respondents with adolescent daughters had immunized their daughters with the vaccine. The married respondents who had not immunized their adolescent daughters cited cost (92%) and unavailability (76%) of the vaccine as major reasons. Among the respondents aware of the vaccine, 93 (83.8%) thought that the use of the vaccine would reduce the incidence of cancer of the cervix, whereas 18 (16.2%) did not know whether it would reduce it or not. Ninety-two (82.9%) respondents wanted the vaccine to be included in the national immunization schedule. One hundred and sixty-one (91%) respondents were aware of the Pap smear, and 148 (83.6%) of its ability to detect precancerous lesions. The awareness of the Pap smear (91%) was significantly higher than that of the HPV vaccine (62.7%) (OR: 0.17; 95% CI: 0.09–0.30) [Table 1]. One hundred and fifteen (71.4%) of those aware of the Pap smear were willing to use it themselves and to recommend it to fellow women. The acceptability rate of the HPV vaccine (91.0%) was however significantly higher than that of the Pap smear (71.4%) (OR: 4.04; 95% CI: 1.94–8.42) [Table 1]. Twenty-five (15.5%) of the women aware of the Pap smear had done the screening in the past. The rest (84.5%) had never done it and gave no reason for not doing the test. However, they were hopeful that they would do the test in the future.

## Discussion

This study demonstrated a significantly higher level of acceptability of the HPV vaccine as a method of preventing cervical cancer despite the significantly lower level of awareness of the vaccine compared to that of the Pap smear. This implies that our health-care workers were much more willing to vaccinate their adolescent daughters or recommend the vaccine to adolescent daughters of other women than doing the Pap smear test themselves or recommending it to other women. As the effectiveness of a vaccine delivery program depends largely on the acceptability of the vaccine among the health-care workers as noted by previous authors,<sup>[8]</sup> it may imply therefore that this new method of prevention of cervical cancer may be more effective than the traditional Pap smear approach at least in this study population. The significantly lower awareness of the HPV vaccine compared to that of the Pap smear suggests the need for public enlightenment. Even though the health-care workers expressed high awareness of cervical cancer as a disease entity and HPV as the causative agent, it may not be appropriate to attribute the high acceptability rate of the HPV vaccine obtained in this study to the mere awareness of the disease condition, as previous studies among university students in Nigeria and women seeking health-care services in Ghana and Kenya with limited awareness of cervical cancer and HPV vaccine prior to health education still demonstrated high acceptability of the vaccine.<sup>[12-14]</sup> What is more important is that the HPV vaccine is acceptable to the health-care workers whose attitude and dispositions contribute to determining the success of any new health-care program. Nevertheless, further study may help unravel the predictors of acceptability of HPV vaccine among our health-care workers.

The uptake of HPV vaccine among the adolescent daughters of respondents in this study was fairly high. It is known that public enlightenment campaigns often have the potential of creating awareness and improving acceptability and uptake of most health-care programs and health-care workers no doubt are key partners in achieving this success. The impact of public enlightenment on the acceptability of HPV vaccine was evident in a recent study from Northwest Tanzania.<sup>[15]</sup> However, the availability of the vaccine at an affordable rate is also a key factor in this realization, based on the evidence in this study. Moreover, certain sociocultural issues such as fear of quality of the vaccine, adverse effects, effects on fertility, and promotion of promiscuity as identified in a previous study from developing countries may need to be addressed.<sup>[16]</sup> Despite the high level of awareness and acceptability of the Pap smear in the study, the uptake by the respondents was very low. A previous study from the study center in 2010 and from South Africa in 2002 reported similar findings among women of high social and educational background.<sup>[17,18]</sup> This may be due to poor health-seeking behavior and attitude to seeking routine preventive medical procedures among people in developing countries, and the psychological unpleasantness

**Table 1: Awareness and acceptability of HPV vaccine and cervical screening**

	Yes (%)	No (%)	Total	P value	OR (95% CI)
<b>Awareness</b>					
HPV vaccine	111 (62.7)	66 (37.3)	177	<0.0001	0.17 (0.09-0.30)
Cervical cancer screening	161 (91)	16 (9)	177		
<b>Acceptability</b>					
HPV vaccine	101 (91)	10 (9)	111	<0.0001	4.04 (1.94-8.42)
Cervical cancer screening	115 (71.4)	46 (28.6)	161		

OR=Odds ratio, CI=Confidence interval, HPV=Human papilloma virus

associated with gynecological examinations.<sup>[19]</sup> Nevertheless, their readiness to recommend both the preventive procedures and the fact that most of them wanted the vaccine included in the national immunization schedule further emphasized their awareness of the inherent risk of not participating in the preventive programme.

The limitations of this study included the fact that the perception of the mothers about the HPV vaccine in terms of acceptability as assessed in this study may differ from those of their 10 to 14-year-old adolescents. However, decisions about uptake of the vaccine may not even be made by these adolescents; so, acceptability of vaccines among their mothers may be a better reflection of the societal response to the introduction of the new vaccine. Second, the main outcome variable in this study was the intention to recommend the HPV vaccine rather than the actual recommendation of the vaccine. However, intention has been associated with actual behaviors including provider immunization behaviors, in a previous study.<sup>[20]</sup>

## Conclusion/Recommendation

The acceptability of the HPV vaccine as a method of preventing cervical cancer is higher than that of the Pap smear despite the significantly lower level of awareness of the vaccine compared to the Pap smear. Available and affordable HPV vaccine appears to hold the key for the prevention of cervical cancer in developing countries where the burden is high. Public enlightenment campaigns, in addition to subsidizing the cost of the vaccine and making it easily available are recommended strategies that could improve its use.

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