Awareness and attitude of female undergraduates toward human papillomavirus vaccine in Ibadan

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ABSTRACT
Introduction: The human papillomavirus (HPV) has significant public health importance because of its high prevalence, mode of transmission, major causative role in cervical cancer, and having effective vaccines. The main thrust of this study was to ascertain the level of awareness of HPV and its vaccines among students as well as their attitudes toward receiving the vaccines.

Materials and Methods: A descriptive cross-sectional survey conducted among female undergraduates of the University of Ibadan using structured self-administered questionnaires. The questionnaires sought to obtain information about their awareness of HPV, their sexual behavior, previous vaccination, and willingness to access HPV vaccination.

Results: A total of 489 students, with a mean age of 19.7 ± 3.2 years, satisfactorily responded to the survey. Overall, 411 (84%) had an overall good knowledge about vaccines, 218 (44.6%) recalled that they had been previously vaccinated in childhood, and 147 (30.1%) were aware of HPV. Only 66 (13.5%) were aware of HPV vaccines, and 10 (2%) had ever been vaccinated against HPV. A majority were willing to get vaccinated if the current price is further reduced.

Conclusion: There is a low level of awareness of HPV and its vaccines among female undergraduates. When available, uptake is restricted by cost. There is an urgent need to support public health programs that increase awareness through adequate information dissemination on mechanisms of cancer prevention and also to strengthen policy efforts that address the barriers of HPV vaccination.

Key words: Awareness; cervical cancer; female students; human papillomavirus; vaccines.

Introduction
The relationship between cervical cancer and sexual behavior, though suspected for more than 100 years, was established by epidemiologic studies in the 1960s. However, in the early 1980s, cervical cancer cells were demonstrated to contain the human papillomavirus (HPV) DNA, whereas epidemiologic studies showing a consistent association between HPV and cervical cancer were published in the 1990s. Cervical cancer remains the disease of the developing world as most developed countries have made giant strides in curbing its occurrence.

Infections with low-risk or non-oncogenic types of HPV, such as types 6 and 11, can cause benign or low-grade cervical cell abnormalities, genital warts, and laryngeal papilloma, whereas high-risk or oncogenic types act as carcinogens in the development of cervical cancer and other anogenital cancers. HPV is transmitted through intimate skin-to-skin contact and can be contacted through the vaginal, anal/oral...
The prevalence, mode of transmission, and availability of vaccines make HPV of significant public health interest,\cite{20} necessitating a need to establish the awareness and accessibility of HPV vaccine in our environment. It has been documented that HPV vaccination in adolescence with continued cervical screening could ultimately lead to a 76% lifetime reduction in cervical cancer deaths and a 50% reduction in cervical screening abnormalities if high coverage of vaccination was achieved,\cite{21,22} but accessibility and affordability have remained an important factor to be considered in facilitating uptake of the vaccines.\cite{23,24} In a report by Hopenhayn et al., in 2007, having knowledge of risk factors for cervical cancer significantly predicted willingness to accept HPV vaccination.\cite{25} In addition, other studies concluded that partner’s approval, history of gynecological disease, and one’s mother had experienced cancer, increased acceptance of HPV vaccination.\cite{26,27} The main thrust of this study was to ascertain the level of awareness of HPV and its vaccines among female undergraduates and determine factors affecting their willingness to receive them.

Materials and Methods

This was a descriptive cross-sectional survey conducted among female undergraduates of the University of Ibadan using structured, self-administered questionnaires. The University of Ibadan was the first and is the largest University in Nigeria with catchment areas covering the entire country.
Discussion

This study revealed a low level of awareness of HPV and its vaccines among the female undergraduate students of the University of Ibadan. Studies conducted in Turkey showed a similar trend in which the level of awareness was found to be 24.1% of their study population.\,[15,28,29] Awareness of HPV, HPV vaccines, and cervical cancer screening has been propagated through mass media, parents, teachers, and visits to health care workers. It has been shown to be influenced by the age, society, and background of the individual; beliefs of parents, and according to Ojiyi et al., 28% of their respondents were aware of the vaccines through the mass media (radio, television, and journals).\,[30] Affecting relatively young women, cervical cancer is the largest single cause of years of life lost to cancer in the developing world.\,[31] The deaths of women who are in their most productive years have a devastating effect on the well-being of their families, resulting, for example, in decrease in school attendance and nutritional status among their children.\,[31]

Mass media is the most common source of information for our respondents, which is similar to findings from the Southeastern part of Nigeria.\,[17] However, there was an increased level of awareness found among 300 and 400 level students, which could be attributed to an impact of the compulsory General Studies course on Reproductive Health and Sexually Transmitted Infections piloted in their batch. In another study, a review done showed that there was a low level of knowledge of both cervical cancer and HPV vaccination among women of low and middle income countries.\,[32]

The mean age of sexual debut was 19 years that has been shown to be a period of high susceptibility of the transformation zone to colonization and as such a major risk factor in contracting HPV infection.\,[20] In another study conducted on the awareness and acceptability among 150 female medical students and health workers in a University Teaching Hospital in Eastern Nigeria, it was deduced that the awareness of HPV vaccine was 74%.\,[17] However, Hsu et al., in assessing the knowledge and beliefs about cervical cancer and HPV among Taiwanese undergraduate women, reported limited knowledge about cervical cancer and HPV,\,[27] whereas Perrotte et al., also reported a knowledge deficit about HPV and cervical cancer in some men and women in Grenada.\,[33]

The awareness of HPV vaccines among respondents of 13.5% is in contrast to 62.7% reported from the Southeastern part of Nigeria\,[17] in a study conducted among female health workers such that the higher level of awareness can be attributed to the profession and medical education. In a study done by Raika Durusoy et al., among 717 students of Ege University, in Izmir, Turkey, it was reported that 75.9% had never heard of HPV, 23.1% had little knowledge, and only 1.0% had good knowledge of HPV, whereas the awareness of HPV vaccines in the study population was equally very low.\,[34]

Table 1: Socio-demographic characteristics of the participants

| Variable                       | Frequency (n) | Percentage |
|--------------------------------|---------------|------------|
| Age group (years)              |               |            |
| <20                            | 290           | 59.3       |
| 20-24                          | 174           | 35.6       |
| 25-29                          | 24            | 4.9        |
| 30 and above                   | 1             | 0.2        |
| The mean age: 19.3±2.6 years; Mode: 18 years |
| Marital Status                 |               |            |
| Single                         | 487           | 99.6       |
| Married                        | 2             | 0.4        |
| Year of study/Level            |               |            |
| 1st/100                        | 242           | 49.5       |
| 2nd/200                        | 77            | 15.7       |
| 3rd/300                        | 49            | 10.0       |
| 4th/400                        | 89            | 18.2       |
| 5th/500                        | 21            | 4.3        |
| 6th/600                        | 11            | 2.3        |
| Faculty                        |               |            |
| Sciences                       | 129           | 26.4       |
| Agriculture and Fisheries      | 76            | 15.5       |
| Art                            | 61            | 12.5       |
| Social Sciences                | 53            | 10.8       |
| Education                      | 49            | 10.0       |
| Basic Medical Sciences         | 44            | 9.0        |
| Law                            | 30            | 6.1        |
| Pharmacy                       | 15            | 3.1        |
| Public Health                  | 15            | 3.1        |
| Technology                     | 11            | 2.2        |
| Veterinary Medicine            | 6             | 1.2        |
| Ever had sex                   |               |            |
| Yes                            | 67            | 14.1       |
| No                             | 422           | 85.9       |
| Age at sexual debut (years)    |               |            |
| ≤15                            | 3             | 4.5        |
| 16-17                          | 17            | 25.4       |
| 18-19                          | 22            | 32.8       |
| 20-21                          | 20            | 29.8       |
| 22 or later                    | 5             | 7.5        |
| Number of sexual partners      |               |            |
| 1                              | 37            | 55.2       |
| 2                              | 18            | 26.9       |
| 3                              | 6             | 8.9        |
| 4                              | 2             | 3.0        |
| More than 4                    | 4             | 6.0        |
| Ever had STI                   |               |            |
| Yes                            | 7             | 1.6        |
| No                             | 422           | 98.4       |

*STI, Sexually transmitted infection; SD, Standard Deviation
A study conducted among South African female students revealed that although the level of acceptability of HPV vaccines is high, the awareness is low. [6] This study also compared with a Nigerian study that showed a low level of awareness among female undergraduates. [35] In a similar vein, an Indian study had reported that 75% of the study participants were willing to get vaccinated. [16] However, Malaysian university students showed relatively low (48%) acceptability of receiving HPV vaccination [36] probably because of their remarkably low level of awareness of HPV, HPV vaccines, and cervical cancer. [36] Other studies conducted among university students reported between 61% and 84% acceptability of HPV vaccination. [35, 37]

Knowing that most students know the benefits of vaccination against many other infectious diseases, extrapolating from that, they feel it is okay to get other vaccines.

This finding is of particular public health significance as it exposes the need for institution of adequate preventive measures against cervical cancer and other HPV related infections. The attitude toward the HPV vaccines could not be adequately assessed as 86.5% of the respondents had never heard about the HPV vaccine. This showed a significant knowledge gap in information about the virus and poor vaccine coverage among other reasons. The cost of the vaccine is relatively high in our environment, being higher than the National minimum wage of the workers, and this positively contributed to the poor attitude toward the HPV vaccination. A similar view on the impact of cost on vaccination has been documented in a study from Canada, which found 91% of the respondents would get the vaccine if it was free, and 72% will get the vaccine if the price was set at 100 US dollars. [24]

The possibility of offering vaccination to young girls up to age 26 years regardless of sexual activity or prior exposure to HPV and even in situations when the patient tested positive for HPV DNA [19] gives a wide window for an adequate catch-up vaccination for this group of respondents. It follows, therefore, that adequate institutional support for public health programs that increase awareness through appropriate information dissemination will yield positive impact. Moreover, educating the populace on mechanisms of cancer prevention and at the same time strengthening efforts that eliminate the barriers to HPV vaccination will ensure reduction in the prevalence of anogenital cancers in our environment. HPV vaccination in adolescents with continued cervical screening could ultimately lead to a 76% lifetime reduction in cervical cancer deaths after many years, and a 50% reduction in cervical screening abnormalities if high coverage of vaccination was achieved. [22]

### Conclusion

The awareness of HPV vaccines is low and where available, cost has restricted its uptake. These findings provide additional support to strengthening public health programs that increase awareness and also policy efforts that address the barriers of HPV vaccination.
Table 4: Relationship between cost and willingness to accept HPV vaccines

| Would you be interested in getting the HPV vaccines | With the current price of the vaccine, would you be willing to get it? | Total |
|---------------------------------------------------|-------------------------------------------------------------------|-------|
| YES                                               | 78                                                                | 230   |
| NO                                                | 10                                                                | 171   |
| Total                                             | 88                                                                | 401   |
| OR=5.8; 95% CI=2.92-11.53                         |                                                                   |       |

If you could get the HPV vaccines free or at a lower cost, would you want to be vaccinated?

| Would you be interested in getting the HPV vaccines | YES | NO |
|---------------------------------------------------|-----|----|
| YES                                               | 257 | 44 |
| NO                                                | 56  | 132|
| Total                                             | 313 | 176|
| OR=13.77; 95% CI=8.80-21.53                       |     |    |

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Conflicts of interest
There are no conflicts of interest.

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