ABSTRACT

Background: Cervical cancer is a public health problem affecting women all over the world. Persistent infection with high-risk types of human papillomavirus (HPV) is a key risk factor for the development of cervical cancer. Besides, HPV vaccines and cervical cancer screening have been established as the primary and secondary preventive measures, respectively, yet studies have documented low uptake of these preventive measures. This study was designed to identify factors associated with uptake of HPV vaccination and cervical cancer screening among female undergraduates in Obafemi Awolowo University, Ile-Ife, Nigeria.

Methods: This is a cross-sectional descriptive study employing a semi-structured, self-administered questionnaire to elicit information from 240 female undergraduates on sociodemographics and factors associated with uptake of HPV vaccines and screening for prevention of cervical cancer. The data collected was analyzed using the statistical package for social sciences (SPSS) version 20.0. Descriptive statistics were used to present data in tables and frequencies.

Results: Findings from the study revealed that 80% of the respondents have heard of cervical cancer; however, only 48.3% and 41.7% have information about HPV vaccination and cervical cancer screening, respectively. The key factors identified for low uptake of HPV vaccination and cervical cancer screening were inadequate information about HPV vaccines (96.7%) and lack of detailed information about cervical cancer screening (94.6%), respectively. However, the least identified factors for low uptake of the primary and secondary preventive measures were some of the respondents considered their age too young to receive HPV vaccines (15%) and lack of time (42.1%) for the uptake of cervical cancer screening.

Conclusion: There is a high level of knowledge about cervical cancer, but does not translate to high uptake of the prevention services. Thus, there is a great need to put in place measures to improve the uptake of HPV vaccination and cervical cancer screening services among the target population.

Key words: Cervical cancer screening; female undergraduates; human papilloma virus; human papilloma virus vaccination; Nigeria.

Introduction

Cervical Cancer is a public health problem worldwide, affecting women of different origins and statuses (World Health Organization[1]). Globally, it is the fourth most
Women become susceptible to developing cervical cancer following human papillomavirus (HPV) infection, but other environmental factors are required for cancer to develop. Several key risk factors for cervical cancer are common in sub-Saharan countries, including prolonged HPV infections and HIV/AIDS, which is endemic in this region (UNAIDS 2012). There are more than 200 different types of high and low risk causing HPV. The viruses have the potential to cause anogenital infection, warts. The high mortality rate from cervical cancer globally could reduce through a comprehensive approach that includes prevention, early detection, effective screening, and treatment programs.

Currently, vaccines (bivalent and quadrivalent) protect against common cancer-causing types 16 and 18. These vaccines show to reduce the risk of cervical cancer significantly. The protection of the quadrivalent vaccine extends to HPV types 6 and 11. Vaccination is profitable at any age, but the best results are gained when the vaccination is completed at the age of 11–13 years. According to Van Kriekinge et al., HPV vaccination of 70% of young girls in low- and middle-income countries could prevent cervical cancer-related death of four million women. The Papanicolaou (Pap) smear has also been noted to reduce the incidence of cervical cancer in the developed countries where nationally organized screening programs exist. Secondary prevention strategies of cervical cancer include screening, early detection, and treatment of precancerous lesions. Early detection enhances effective treatment that can be initiated.

Several barriers hinder the uptake of cervical cancer screening in LMICs. However, few studies have evaluated these barriers, particularly those related to cultural and religious differences in complex societies such as Nigeria. These barriers include low levels of knowledge of cervical cancer, limited awareness of prevention and early detection methods, fear of the stigma associated with a cancer diagnosis, concerns about spousal disapproval of screening, and concerns about violations of religious and cultural obligations of modesty during screening procedures. Various reasons have cited for non-uptake of preventive measures among parents. Mortensen reported that parents refuse the HPV vaccine for a variety of reasons, including miscommunication between patients and clinicians, profound knowledge about HPV, and lack of awareness of the association between HPV and cervical cancer. In addition, Ezat et al. stated that mothers might express fear about the safety of the vaccines. According to Waller et al., uptake of cervical cancer screening is affected by several factors, including deprivation, accessibility and acceptability of the test, educational attainment and information about cervical cancer and hence the perception of risk. At the moment, the level of uptake of HPV vaccines among young undergraduates in Nigeria is not established, and the study is designed to document identified factors associated with low uptake of HPV vaccination and cervical cancer screening among female undergraduates at Obafemi Awolowo University in Nigeria with the specific objectives assessing the level of awareness and knowledge of cervical cancer and its prevention among female undergraduates of the university and identify factors influencing the low uptake of HPV vaccination and cervical cancer screening among them.

**Methods**

This study utilized a descriptive cross-sectional survey design conducted among female undergraduates of Obafemi Awolowo University. The data was collected using a semi-structured self-administered questionnaire. Two hundred and forty (240) respondents formed the sample size using Cochrane formula at a proportion of 19.7%. There are four female undergraduate halls of residence: Mozambique, Alumni, Akintola, and Moremi. These halls of residence have 122 rooms, 60 rooms, 128 rooms, and 240 rooms, respectively. Each room has 4 occupants except for the Mozambique hall of residence that has 8 occupants in each room. The systematic random sampling technique was adopted to select the rooms in each hall of residence that were visited for the survey and proportionate sampling was used to select the respondents from the sample frame. The number of rooms visited in each hall of residence was based on the sampling technique. Participation was strictly voluntary and based on consent. Permission to collect data was obtained at the department and the dean of students’ affair for ethical consideration. The factor with $P$ value $\leq 0.05$ was identified to be significantly associated with the uptake of HPV vaccination and screening for the prevention of carcinoma of the cervix.
Results

A total of 240 respondents participated in the study. Findings from the survey revealed the highest proportion of the respondents (49.2%) were aged between 15–20 years, 32.9% were in their 200 level. In addition, the highest percentages of them (90.8%) were single and predominantly Christian (78.8%) [Table 1]. Findings from the study revealed that 80% of the respondents have heard of cervical cancer; however, only 48.3% and 41.7% have information about HPV vaccination and cervical cancer screening, respectively [Figure 1]. The key factors identified for low uptake of HPV vaccination and cervical cancer screening were inadequate information about HPV vaccines (96.7%) and lack of detailed information about cervical cancer screening (94.6%), respectively. However, the least identified factors for low uptake of the primary and secondary preventive measures were some of the respondents considered their age too young to receive HPV vaccines (15%) and lack of time (42.1%) for the uptake of cervical cancer screening [Table 2].

Discussion

Awareness and knowledge of cervical cancer among the study participants is very high, as an outstanding number of them had adequate knowledge about cervical cancer and its prevention. However, this finding is in contrast with results among Maldives women where a limited level of awareness of cervical cancer was reported. In addition, more than half of the respondents knew about the availability of the HPV vaccine in Nigeria. However, two-thirds of the respondents did not know the correct dosage and the interval between doses. These show that knowledge about the HPV vaccine in Nigeria is still low. This finding agrees with Agida et al. study where knowledge about the HPV vaccine was low. Respondents’ views on when to commence the cervical cancer vaccine was to begin once sexual activity begins. This finding negates finding from the research of Hasnaoui et al. which reported that vaccination should start at a young age 11–13 years of age.

Furthermore, the level of knowledge of the respondents on screening methods revealed that more than half of the respondents knew about the screening methods. But about two-thirds of the respondents did not know about the HPV vaccine. This outcome is in tandem with the work of Agida et al. on the level of knowledge of HPV vaccine. In addition, very few of the respondents knew of a Pap smear method, virus testing with an acetic acid method, virus testing with Lugol solution method, and Self-Sampling method, as the various methods of screening for cervical cancer. This result is comparable to the findings of Abudukadeer et al. where the knowledge of women about Pap smear testing method and other cervical cancer screening methods was low.

A high proportion of the respondents agreed that they can undergo cervical cancer screening and HPV vaccination. Conversely, less than one-tenth of the student had undergone
DNA testing and Pap smear testing, respectively, and less than one-tenth also had been vaccinated. This finding is in support of the results of Ugwu et al.\[9\] among female health care workers in Southeastern Nigeria. This outcome presents a great need for effective vaccination services at affordable rates for women.

Factors militating against the uptake of cervical cancer vaccination and screening include lack of information as about two-thirds of the respondents confirmed inadequate information. In addition, cost and lack of personal conviction about screening methods of cervical cancer or use vaccines were significant factors associated with non-uptake. This result corroborates the report of Ajah et al.,\[16\] in Abakaliki Ebonyi State, Nigeria and WHO,\[1\] where cost and availability were discovered as the major factors influencing uptake. Montgomery et al.,\[17\] also reported fear of side effect to be one key factor influencing acceptance of the vaccine. In conclusion, these factors were all found to affect cervical cancer screening and vaccination. The outcome implies that information about screening and use of vaccines in Nigeria is relatively low. Information about the disease is not complete without a corresponding knowledge on the screening and availability of vaccines; hence, a greater need to disseminate information about cervical screening and vaccination and also provide the services at very subsidized costs. However, a good number of the respondents downplayed family/friends factors as a factor influencing cervical cancer vaccination uptake. This finding conversely to the outcome of Mortensen\[12,13\] who reported an influence of family members as a significant factor influencing the uptake of screening and vaccination.

**Recommendation**

The following recommendations are proposed to enhance knowledge of cervical cancer, uptake of its vaccination and screening.

- Health education/orientation program for fresh student on cervical cancer, its screening and vaccination
- Incorporating HPV vaccine into national immunization program
- Subsidizing and if possible free screening services for sexually active student
- Availability of center for counseling, screening, and vaccination services on campus
- The use of health educative fliers, posters, and handbills that contain easy-to-read and understandable information on cervical cancer.

**Conclusion**

Knowledge of cervical cancer, its screening methods, and vaccination methods are low among the study participants. This result presents a great need to tackle the menace of cervical cancer in our society. Inadequate information and personal conviction have been attributed to the significant factors influencing or undermining the uptake of cervical cancer screening and vaccination among the respondents.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the participants have given their consent for their images and other clinical
Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

References
1. World Health Organization, Cervical Cancer. 2014. Available from: http://www.afro.who.int/en/clusters-a-programmes/DPC/non communicable diseases management tmdm/programme components/ cancer/cervical-cancer/2810-cervical-cancer.html. [Last accessed on 2016 Aug 02].
2. Pooja B. Acceptability of self-collection sampling for HPV-DNA testing in low-resource settings: A mixed methods approach. BMC Public Health, 2014;14;1.
3. Ferlay J, Ervik M, Lam F, Mery L, Piñeros M, et al. Global Cancer Observatory: Cancer Today. Lyon, France: International Agency for Research on Cancer; 2018.
4. Sankaranarayanan R, Prabhu PR, Pawlita M, Gheit T, Bhatla N, Muwonge R, et al. Immunogenicity and HPV infection after one, two, and three doses of quadrivalent HPV vaccine in girls in India: A multicentre prospective cohort study. Lancet Oncol 2016;17:67-77.
5. GLOBOCAN. Cervical cancer: Estimated incidence, mortality and prevalence worldwide in 2012. Available at: http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx. [Last accessed on 02 Aug 2014].
6. Bruni L, Albero G, Serrano B, Mena M, Gómez D, Muñoz J, et al. ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre). Human Papillomavirus and Related Diseases in Nigeria, 2019.
7. UNAIDS. HPV, HIV and cervical cancer: Leveraging synergies to save women’s lives. Geneva: UNAIDS; 2016. http://www.unaids.org/sites/default/files/media_asset/2851_HPV-HIV-cervicalcancer_en.pdf. [Last accessed on 2017 Jan 16].
8. Greener M. Tackling HPV and cervical cancer: Looking at the whole picture. Br J Sch Nurs 2014;9:377-80.
9. National Cancer Institute. National Cancer Institute: factsheet. 2012; Available from: http://www.cancer.gov/cancertopics/factsheet/Risk/HPV. [Last accessed on 02 Aug 2014].
10. Isa Modibbo F, Dareng E, Bammisaye P. Qualitative study of barriers to cervical cancer screening among Nigerian women BMJ Open 2016;6:e008533.
11. van Kriekinge G, Castellsague X, Cibula D. Estimation of the potential overall impact of human papillomavirus vaccination on cervical cancer cases and deaths. Vaccine 2014;32:733-9.
12. Mortensen GL. Drivers and barriers to acceptance of human papillomavirus vaccination among young women: A qualitative and quantitative study. BMC Public Health 2010;10:68.
13. Ezat SW, Hod R, Mustafa J, Mohd D, Ahmad ZH, Sulaiman AS, et al. National HPV immunisation programme: Knowledge and acceptance of mothers attending an obstetrics clinic at a teaching hospital, Kuala Lumpur. Asian Pac J Cancer Prev 2013;14:2991-9.
14. Waller J, Beer H, Hibberts S, Brophy S, Rahman MA, Paranjothy S. Does the HPV vaccination programme have implications for cervical screening programmes in the UK. Vaccine 2014;32:1828-33.
15. Isa-Modibbo FI, Dareng E, Bammisaye P. Qualitative study of barriers to cervical cancer screening among Nigerian women. BMJ 2016;11;6:e008533. doi:10.1136/bmjopen-2015-008533.
16. Basu P, Hassan S, Fileshia F, Mohamed S, Nahoodha A, Shiuna A, et al. Knowledge, attitude and practices of women in Maldives related to the risk factors, prevention and early detection of cervical cancer. Asian Pac J Cancer Prev 2014;15:6691-5.
17. Montgomery MP, Dune T, Shetty PK, Shetty AK. Knowledge and acceptability of human papillomavirus vaccination and cervical cancer screening among women in Karnataka, India. J Cancer Educ 2015;30:130-7.
18. El Hasnaoui A, Demarteau N, Granados D, Sendaert B, Detournay B. Public health impact of human papillomavirus vaccination on prevention of cervical cancer in France. Int J Public Health 2012;57:149-58.
19. Agida TE, Akaba GO, Isah AY, Ekele B. Knowledge and perception of human papillomavirus vaccine among the antenatal women in a Nigerian tertiary hospital. Niger Med J 2015;56:23.
20. Abudukadeer A, Azam S, Mutaalipu AZ, Qun L, Guilin G, Miijiti S. Knowledge and attitude of Uyghur women in Xinjiang province of China related to the prevention and early detection of cervical cancer. World J Surg Oncol 2015;13:1-7.