

**Original Article****Open Access****Knowledge, perception and uptake of human papillomavirus (HPV) vaccine among future healthcare providers: Insights from a medical school in Ogun State, Nigeria**

^{*1}Akinola-Fowotade, O., ²Oluwole, T. O., ³Omobowale, O., and ⁴Fowotade, A.

¹Benjamin S. Carson College of Health and Medical Sciences, Babcock University, Ogun State, Nigeria

²Department of Medical Microbiology, Babcock University, Ogun State, Nigeria

³Department of Community Medicine, College of Medicine, University of Ibadan, Nigeria

⁴Department of Medical Microbiology and Parasitology, College of Medicine, University of Ibadan, Nigeria

*Correspondence to: onaopemipofowotade@gmail.com; +2348108671326

Abstract:

Background: Human papillomavirus (HPV) is the primary cause of cervical cancer. Despite the availability of highly effective vaccines, awareness and uptake remain inadequate in many low- and middle-income countries. Medical students, as future healthcare providers, play a crucial role in patient education, health promotion, and vaccine advocacy within their communities. Their knowledge, attitudes, and personal vaccination behaviors directly influence their ability to counsel patients and recommend HPV vaccination effectively. Understanding the knowledge levels, perceptions, and barriers to HPV vaccination among this population is essential for developing targeted educational interventions. The objective of this study is to assess the knowledge, perception, and uptake of HPV vaccination among female medical students in a tertiary institution in Nigeria.

Methodology: A descriptive cross-sectional study was conducted among 100 female medical students at Babcock University, Ilishan-Remo, Ogun State, Nigeria, using a structured, self-administered questionnaire to collect information on socio-demographic characteristics, knowledge, perceptions, uptake, and barriers related to HPV vaccination. Descriptive analysis was performed using frequencies and percentages. Association of HPV knowledge with practice of HPV prevention was determined using Chi square or Fischer's Exact test, and $p < 0.05$ was considered statistically significant.

Results: Majority of the participants (82.0%) were 18–23 years of age, and mostly (65.0%) of Yoruba tribe. Knowledge of HPV was categorized as adequate in 70.0% of the participants, with 87.0% having knowledge of HPV as being sexually transmitted, and 91.0% had knowledge of the link between HPV and cervical cancer. However, only 35.0% had received HPV vaccine. Knowledge of HPV was significantly associated with vaccine promotion, as 94.2% of participants with adequate knowledge would recommend vaccine to family and friends, compared to 70.0% of those with inadequate knowledge ($p = 0.0002$). Knowledge was not significantly associated with HPV prevention practice ($p = 0.17$). Major barriers to HPV vaccination highlighted by participants included lack of information, vaccine unavailability, and misconceptions such as infertility and depopulation conspiracies.

Conclusion: Although knowledge of HPV is high among the female medical students, vaccine uptake is low. Addressing misconceptions and barriers to HPV vaccination is vital to improving vaccine uptake.

Keywords: Knowledge; Perception, HPV vaccine; Medical student; Healthcare provider

Received Jul 26, 2025; Revised Sep 30, 2025; Accepted Oct 5, 2025

Copyright 2026 AJCEM Open Access. This article is licensed and distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided credit is given to the original author(s) and the source. Editor-in-Chief: Prof. S. S. Taiwo

Connaissances, perception et adoption du vaccin contre le virus du papillome humain (VPH) par les futurs professionnels de santé: Études menées dans une faculté de médecine de l'État d'Ogun, au Nigéria

^{*1}Akinola-Fowotade, O., ²Oluwole, T. O., ³Omobowale, O., et ⁴Fowotade, A.

¹Collège Benjamin S. Carson des Sciences de la Santé et de la Médecine, Université Babcock, État d'Ogun, Nigéria

²Département de Microbiologie Médicale, Université Babcock, État d'Ogun, Nigéria

³Département de Médecine Communautaire, Faculté de Médecine, Université d'Ibadan, Nigéria

⁴Département de Microbiologie Médicale et de Parasitologie, Faculté de Médecine, Université d'Ibadan, Nigéria

*Correspondance à: onaopemipofowotade@gmail.com; +234 810 867 1326

Résumé:

Contexte: Le virus du papillome humain (VPH) est la principale cause de cancer du col de l'utérus. Malgré la disponibilité de vaccins hautement efficaces, la sensibilisation et la couverture vaccinale restent insuffisantes dans de nombreux pays à revenu faible ou intermédiaire. Les étudiants en médecine, futurs professionnels de santé, jouent un rôle crucial dans l'éducation des patients, la promotion de la santé et la promotion de la vaccination au sein de leurs communautés. Leurs connaissances, leurs attitudes et leurs comportements personnels en matière de vaccination influencent directement leur capacité à conseiller les patients et à recommander efficacement la vaccination contre le VPH. Comprendre les niveaux de connaissances, les perceptions et les obstacles à la vaccination contre le VPH au sein de cette population est essentiel pour développer des interventions éducatives ciblées. L'objectif de cette étude est d'évaluer les connaissances, la perception et la couverture vaccinale contre le VPH chez les étudiantes en médecine d'un établissement d'enseignement supérieur au Nigéria.

Méthodologie: Une étude transversale descriptive a été menée auprès de 100 étudiantes en médecine de l'Université Babcock, à Ilishan-Remo, dans l'État d'Ogun, au Nigéria, à l'aide d'un questionnaire structuré et auto-administré pour recueillir des informations sur les caractéristiques sociodémographiques, les connaissances, les perceptions, la couverture vaccinale et les obstacles liés à la vaccination contre le VPH. Une analyse descriptive a été réalisée à l'aide de fréquences et de pourcentages. Français L'association entre la connaissance du VPH et la pratique de la prévention du VPH a été déterminée à l'aide du test du Chi carré ou du test exact de Fischer, et $p < 0,05$ a été considéré comme statistiquement significatif.

Résultats: La majorité des participants (82.0%) étaient âgés de 18 à 23 ans et appartenaient majoritairement (65.0%) à la tribu Yoruba. Les connaissances sur le VPH ont été jugées suffisantes par 70.0% des participantes, dont 87.0% savaient que le VPH était sexuellement transmissible et 91.0% connaissaient le lien entre le VPH et le cancer du col de l'utérus. Cependant, seulement 35.0% avaient été vaccinées contre le VPH. La connaissance du VPH était significativement associée à la promotion de la vaccination comme 94,2% des participantes disposant de connaissances suffisantes recommanderaient le vaccin à leur famille et à leurs amis, contre 70.0% de celles dont les connaissances étaient insuffisantes ($p = 0,0002$). La connaissance n'était pas significativement associée aux pratiques de prévention du VPH ($p = 0,17$). Les principaux obstacles à la vaccination contre le VPH mis en avant par les participantes comprenaient le manque d'information, l'indisponibilité du vaccin et les idées fausses telles que l'infertilité et les théories du complot contre la dépopulation.

Conclusion: Bien que les étudiantes en médecine soient bien informées sur le VPH, la vaccination est faible. Il est essentiel de lutter contre les idées fausses et les obstacles à la vaccination contre le VPH pour améliorer la vaccination.

Mots-clés: Connaissances; Perception; Vaccin contre le VPH; Étudiante en médecine; Professionnelle de santé

Introduction:

Cervical cancer remains a significant public health concern globally, ranking as the fourth most common cancer affecting women, with an estimated 604,000 new cases and 342,000 deaths worldwide in 2020 alone (1). The burden is disproportionately higher in low- and middle-income countries (LMICs), where approximately 90% of cervical cancer deaths occur (2). Nigeria, the most populous country in Africa, contributes substantially to this burden, with thousands of new cases diagnosed annually and limited access to screening and preventive healthcare (3).

Persistent infection with high-risk strains of the human papillomavirus (HPV), particularly types 16 and 18, is recognized as the primary aetiological factor for cervical cancer (4). HPV is the most common sexually transmitted infection globally (4), and while most infections are transient and asymptomatic, persistent infection with oncogenic types can lead to malignant transformation, particularly in the cervix (5).

In response to this, the World Health Organization (WHO) recommends vaccination of adolescent girls, typically aged 9-14 years, before the onset of sexual activity, as a key

pillar in its global strategy to eliminate cervical cancer as a public health problem (6). Clinical trials and population-based studies have consistently demonstrated the safety, efficacy, and cost-effectiveness of the HPV vaccine in preventing cervical pre-cancer and cancer (7,8). Despite this, the uptake of HPV vaccination in Nigeria and many other LMICs remains unacceptably low due to a combination of factors, including limited awareness, vaccine hesitancy, misinformation, cost barriers, cultural and religious concerns, and inadequate integration into national immunization programs (9-11).

Healthcare professionals play a crucial role in influencing public attitudes and behaviors regarding vaccination. Medical students, in particular, represent a strategic group as they not only form a reservoir of future health workforce leaders and decision makers who will be involved in policy implementation (12). Their personal beliefs, knowledge base, and vaccination practices can either reinforce or undermine public trust in vaccines.

This study was conducted to assess the awareness, perception, and uptake of HPV vaccination among female medical students in Nigeria. By identifying knowledge gaps, prevailing attitudes, and barriers to vaccine up-

take, the findings aim to inform targeted educational campaigns in this key population.

Materials and method:

Study design and setting:

A descriptive, cross-sectional survey was conducted among 100 female medical students at Babcock University, Ilishan-Remo, Ogun State, Nigeria. Participants included female students in their 4th to 6th year of clinical study, who gave informed consent to participate in the study. The participants were recruited using a non-probability (convenience) sampling technique.

Data collection:

Data collection was done using a semi-structured, self-administered questionnaire designed to collect information on sociodemographic characteristics, knowledge of HPV and cervical cancer, perception of HPV vaccination, HPV vaccine uptake and willingness to be vaccinated, and barriers and myths influencing vaccine uptake. Knowledge and perception of the participants were assessed using single multiple-choice (SMC) method.

The questionnaire was piloted among 10 students from the same institution but outside of the medical school. The internal consistency of the questionnaire was assessed with an overall scale that yielded Cronbach's alpha score of 0.82, indicating good reliability.

Data analysis:

Data were entered, cleaned, and coded using Microsoft Excel before being imported into the Statistical Package for the Social Sciences (SPSS) version 25.0 for analysis. Descriptive statistics were used to summarize the data, including computation of frequencies, percentages, and proportions to describe participants' socio-demographic characteristics (age group, religion, tribe) as well as perceptions, and preventive practices regarding HPV vaccine uptake.

For knowledge assessment, the responses were grouped and analyzed to identify participants' knowledge level. The maximum obtainable score on the knowledge assessment was 21, and the mean score among participants was 19 ± 1.2 . Based on the scoring criteria, participants were classified as having adequate knowledge if the score is >19 and inadequate knowledge if the score is <19 .

Reasons for not taking HPV vaccine were highlighted using the participants' exact words. Inferential statistical tests were performed using Chi square and Fischer's Exact test to determine association of knowledge with practice of HPV prevention. P value < 0.05 was considered statistically significant.

Results:

Sociodemographic characteristics of study participants:

Most of the participants are females aged 18-23 years (82.0%), with a mean age of 19.2 years. Majority are Christians (93.0%), and 65.0% belonged to the Yoruba tribe (Table 1).

Table 1: Socio-demographic characteristics of the study participants

Characteristics	Frequency	Percentage (%)
Religion		
Christian	93	93.0
Islam	7	7.0
Tribe		
Urhobo	2	2.0
Edo	5	5.0
Etsako	1	1.0
Hausa	1	1.0
Ibibio	1	1.0
Idoma	1	1.0
Igbo	19	19.0
Ika	2	2.0
Ikwere	2	2.0
Yoruba	66	66.0
Year of study		
400-Level	37	37.0
500-Level	42	42.0
600-Level	21	21.0
Age group (years)		
≤ 17 years	16	16.0
18 -23 years	82	82.0
≥ 24 years	2	2.0
Mean age (years)	19.2	
Total	100	100.0

Knowledge of HPV and cervical cancer among study participants:

Majority (87.0%) of the participants had the knowledge that HPV is primarily transmitted through sexual contact, while 91.0% of participants had the knowledge of the link between HPV and cervical cancer. On HPV vaccine effectiveness in preventing HPV infection, 95.0% had the knowledge that HPV vaccine is effective. Similarly, 96.0% had the knowledge that HPV vaccine is recommended for adolescents and young adults. However, only 21% knew that the appropriate age group of HPV vaccination was 9-14-years as recommended by the WHO (Table 2A).

Table 2B shows the knowledge level of the participants based on the scoring criteria, with 70.0% categorized as having 'adequate knowledge' (score > 19), and 30.0% classified as having 'inadequate knowledge' (score < 19).

Table 2A: Knowledge of HPV and cervical cancer among study participants

Variables	Frequency	Percentage (%)
HPV is primarily transmitted through sexual contact		
Yes	87	87.0
No	10	10.0
Maybe	3	3.0
HPV infection can lead to cervical cancer in women		
Yes	91	91.0
No	0	0.0
Maybe	9	9.0
HPV Vaccine is effective in preventing HPV infection		
Yes	95	95.0
No	5	5.0
Maybe	0	0
HPV vaccine is recommended for adolescents and young adults		
Yes	96	96.0
No	4	4.0
Maybe	0	0
Persistent HPV infections might be associated with cervical cancer		
Yes	76	76.0
No	0	0
Maybe	4	4.0
Recommended age group in Nigeria affected with HPV infections is 9-14 years?		
Yes	21	21.0
No	57	57.0
Maybe	22	22.0
Total	100	100.0

Table 2B: Knowledge levels of study participants

Knowledge level	Number of participants (%)
Inadequate (score <19)	30 (30.0)
Adequate (score > 19)	70 (70.0)
Total	100 (100.0)

Perception of HPV vaccine among study participants:

Ninety-four (94.0%) participants believed HPV is a significant health concern while 80.0% rated HPV vaccine as very important. Few (13.0%) respondents perceived there is high social stigma against receiving the HPV vaccine while 13.0% believed that cultural or religious beliefs could influence their views on HPV vaccination. Although 82.0% believed female students should be required to take the vaccine, fewer respondents (62.0%) supported the same for male students (Table 3).

Practice of HPV prevention:

Only 35.0% of the respondents reported having received HPV vaccine at the time of the survey, indicating low vaccine uptake. However, a large proportion (74.0%) expressed willingness to receive the vaccine in the future,

Table 3: Perception of HPV vaccination among participants

Questions	Frequency	Percentage (%)
Do you believe HPV infection is a significant health concern?		
Yes	94	94.0
No	2	2.0
Maybe	4	4.0
Do you believe the HPV vaccine is safe?		
Yes	79	79.0
No	15	5.0
Maybe	16	16.0
Do you think HPV vaccination is important?		
Yes	80	5.0
No	15	15.0
Maybe	5	80.0
Do you perceive the social stigma associated with HPV vaccination as high?		
Yes	13	13.0
No	24	24.0
Maybe	63	63.0
Are there any cultural or religious beliefs influencing your views on HPV vaccination?		
Yes	9	9.0
No	84	84.0
Maybe	7	7.0
Do you think female medical students should be required to receive the HPV vaccine?		
Yes	82	82.0
No	8	8.0
Maybe	10	10.0
Do you think male medical students should be required to receive the HPV vaccine?		
Yes	62	62.0
No	16	16.0
Maybe	22	22.0
Total	100	100.0

and 83.0% would accept HPV vaccine if offered at no cost. Furthermore, 82.0% of participants are open to discussing HPV vaccination with their healthcare provider. Additionally, 87.0% would recommend HPV vaccination to friends or family members (Table 4).

Statistical analysis showed significant association between participant's knowledge of HPV vaccine promotion practices with willingness to recommend HPV vaccine to family and friends ($p=0.002$), but no significant association with HPV vaccine receipt ($OR=2.190$, 95% $CI=0.83-5.79$, $p=0.17$) (Table 5).

Barriers to HPV vaccination updates:

Only 15 (15.0%) participants highlighted their reasons for not taking HPV vaccine as well as perceived misconceptions about the vaccine. These include fear of infertility, high vaccine costs, lack of information, and access issues. Common misconceptions included 'vaccine causes infertility', 'Africans are used as test subjects', 'Only promiscuous or older women get HPV' and 'vaccine may cause the HPV associated disease' (Box 1).

Table 4: Practice of HPV prevention and vaccine promotion

Questions	Frequency	Percentage (%)
Have you received the HPV vaccine?		
Yes	35	35.0
No	65	65.0
Maybe	0	0
Would you consider getting vaccinated against HPV in the future?		
Yes	74	74.0
No	14	14.0
Maybe	12	12.0
Are you open to discussing HPV vaccination with your healthcare provider?		
Yes	82	82.0
No	3	3.0
Maybe	15	15.0
Would you recommend HPV vaccination to your friends or family members?		
Yes	87	87.0
No	4	4.0
Maybe	9	9.0
Would you consider getting vaccinated against HPV if it were offered to you for free?		
Yes	83	83.0
No	6	6.0
Maybe	11	11.0
Have you received any education on HPV and HPV vaccine prior to this survey?		
Yes	75	75.0
No	21	21.0
Maybe	4	4.0
Total	100	100.0

Box 1: Specified reasons for not receiving HPV vaccine by 15 respondents

Did not know where to get the vaccine
Fear of needles
I haven't had the opportunity
There isn't enough information on the long-term side effect
I don't see the need yet
I just found out about it
I just haven't found the time
I've never heard of the vaccine
It wasn't available when I wanted to get it
Just knowing about HPV for the first time
Just never had the chance
The cost of the vaccine is too expensive
The vaccine causes infertility
The vaccine has untoward side effects
The vaccine reduces female libido

Discussion:

The results of this study showed a high level of knowledge of HPV and cervical cancer among female medical students of Babcock University, with 70% categorized as having adequate knowledge. Majority of the students understood the sexual transmission route of HPV and its association with cervical cancer. These findings are consistent with previous

studies in Nigeria and other sub-Saharan African countries, where medical students' generally exhibit higher levels of health literacy compared to the general population (7,8). Despite this high level of knowledge of HPV, vaccine uptake remains low, with only 35.0% of the participants having received the vaccine. This mirrors trends observed in similar studies across Africa, which point to a persistent gap between knowledge and preventive action (9,10).

Socio-cultural myths, limited access, and perceived side effects continue to obstruct the effective implementation of HPV vaccination (9,10), this is similar to findings from other studies on how sociocultural beliefs and myths affected knowledge of health conditions (13,14). The primary reasons for non-uptake among respondents in our survey included limited access, insufficient information about vaccine availability, and lingering safety concerns. Participants cited inaccessibility, unavailability of vaccine and affordability as well as fear of infertility as reason for not getting vaccinated against HPV. These findings highlight the need for intensified educational campaigns to debunk myths and promote scientific understanding.

Encouragingly, majority (83.0%) of the students expressed willingness to receive the vaccine in the future, particularly if it were made available at no cost. This reflects both a strong intent for preventive health behavior and recognition of financial constraints as a key barrier to vaccine access. Offering the vaccine at subsidized or no cost within University health services could therefore significantly improve uptake. Similar observations have been made from other African countries where policy-driven vaccine mandates and free services led to increased coverage (9,10). The acceptance of HPV vaccination can be improved among medical students through organizing interactive workshop and seminars with expert, delivering focused guest lectures, conducting campus-wide awareness campaigns, and encouraging participation in research projected dedicated to HPV prevention (11, 12).

Another notable finding is that 75.0% of the students had received prior education on HPV and vaccine. This level of exposure appears to have had a positive impact on their knowledge and perception, although this has not yet fully translated into behavior change. This points to the need for multi-level strategies that not only increase knowledge but also address access, affordability, and social support for vaccination. Furthermore, the perception of stigma related to HPV vaccination, reported by a majority of the students, indicates the influence of societal attitudes on vaccine acceptance. Addressing such stigma will

Table 5: Association of HPV knowledge and HPV prevention and vaccine promotion practices

Practice of HPV prevention		HPV knowledge		Total	χ^2	OR (95% CI)	p value
		Adequate (%)	Inadequate (%)				
Would you recommend HPV vaccine to your friends or family members?	Yes	66 (94.2)	21 (70.0)	87 (87.0)	10.986	NA	0.0002*
	No	2 (2.9)	2 (6.7)	4 (4.0)			
	Maybe	2 (2.9)	7 (23.3)	9 (9.0)			
Have you received HPV vaccine?	Yes	28 (40.0)	7 (23.3)	35 (35.0)	1.884	2.190 (0.83-5.79)	0.17
	No	42 (60.0)	23 (76.7)	65 (65.0)			

HPV=Human papillomavirus; χ^2 =Chisquare; OR=Odd ratio; CI=Confidence interval; NA=Not applicable; *=Statistically significant

require peer-led health promotion, student-centered advocacy. There is the need to further explore the belief of the participants and how it serves as a barrier to the practice of vaccination despite the high level of knowledge observed. Given that these students are future health professionals, equipping them with both the knowledge and motivation to advocate for HPV vaccination is essential to scaling up national vaccination programs.

This study underscores the complexity of HPV vaccine hesitancy, even among well-informed populations. It emphasizes the urgent need for a holistic approach that combines education, accessibility, cost-reduction, and cultural sensitivity to improve vaccine uptake among young women in Nigeria. However, the generalizability of our findings is limited because participants were selected by a non-probability (convenience) sampling method, with no sample size estimation at the onset of the study. Also, being a self-reported information given by the participants, information bias is a factor that may have significant effect on the quality level of evidence provided in the study.

Conclusion:

Despite high knowledge and positive perceptions among female medical students of Babcock University in Nigeria, actual HPV vaccine uptake is low. Multi-pronged strategies involving improved education, accessibility, cost reduction, and continuous social media-based advocacy are crucial. As future health professionals, the population group holds strategic potential to influence public health behavior, making targeted interventions both timely and impactful.

Acknowledgements:

The authors acknowledge the students and staff of Babcock University for their willingness to participate in the study

Contributions of authors:

OAF designed the study protocol and administered the study questionnaire; TOO and OO contributed to the questionnaire design and also supervised the survey; and AF edited the study protocol. All authors contributed to the preparation, editing and approval of the manuscript submitted for publication.

Source of funding:

No external funding was received for the study

Conflict of interest:

Authors declare no conflict of interest

References:

1. Bosch, F. X., Lorincz, A., Muñoz, N., Meijer, C. J., and Shah, K. V. The causal relation between human papillomavirus and cervical cancer. *J Clin Pathol.* 2002;55(4):244-265. doi: [10.1136/jcp.55.4.244](https://doi.org/10.1136/jcp.55.4.244).
2. World Health Organization. Cervical cancer. Geneva: World Health Organization; 2022. <https://www.who.int/news-room/fact-sheets/detail/cervical-cancer>. (Accessed June 15, 2025).
3. Markowitz, L. E., Dunne, E. F., Saraiya, M., Lawson, H. W., Chesson, H., and Unger, E. R. Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). *Recommendations and Reports. Morb Mortal Wkly Rep.* 2007; 56 (RR-2): 1-24.
4. Bruni, L., Albero, G., Serrano, B., et al. Human papillomavirus and related diseases in Nigeria. Summary Report 2021-02-17. Barcelona: ICO/IARC HPV Information Centre; 2021.
5. Ezeanochie, M. C., and Olagbuiji, B. N. Human papillomavirus vaccine: Determinants of acceptability by mothers for adolescents in Nigeria. *Afr J Reprod Health.* 2014; 18 (3): 154-158.
6. Odetola, T. D. Health care providers' knowledge and attitudes regarding HPV vaccine in Nigeria. *Afr J Prim Health Care Fam Med.* 2015; 7(1):1-5.
7. Ezenwa, B. N., Balogun, M. R., and Okafor, I. P. Mothers' human papillomavirus knowledge and willingness to vaccinate their adolescent

- daughters in Lagos, Nigeria. *Int J Women Health*. 2013; 5:371–377. doi:[10.2147/IJWH.S44483](https://doi.org/10.2147/IJWH.S44483). Print 2013
8. Chigbu, C. O., Onyebuchi, A. K., Onyeka, T. C., Odugu, B. U., and Dim, C. C. The impact of community health educators on uptake of cervical and breast cancer prevention services in southeast Nigeria. *Int J Gynaecol Obstetr*. 2017; 137 (3): 319–324. doi: [10.1002/ijgo.12150](https://doi.org/10.1002/ijgo.12150)
 9. Gallagher, K. E., LaMontagne, D. S., and Watson-Jones, D. Status of HPV vaccine introduction and barriers to country uptake. *Vaccine*. 2018; 36 (32 Pt A): 4761–4767. doi: [10.1016/j.vaccine.2018.02.003](https://doi.org/10.1016/j.vaccine.2018.02.003)
 10. Ngugi, C. W., Boga, H., Muigai, A. W., Wanzala, P., and Mbithi. J. N. Factors affecting uptake of cervical cancer early detection measures among women in Thika, Kenya. *Health Care Women Int*. 2012; 33 (7): 595–613. doi: [10.1080/07399332.2011.646367](https://doi.org/10.1080/07399332.2011.646367).
 11. Adewole, I. F., Babalola, A. O., Odetara, C., Abudu, O. O., Awosika-Olumo, A., and Omotade, O. O. Human papillomavirus vaccination and the role of the healthcare provider. *Afr J Reprod Health*. 2019; 23 (2): 15–22.
 12. Odutola, M., Jibrin, Y. B., Nguku, P., Korir, C., Abubakar, A., and Shuaib, F. Addressing vaccine hesitancy in Nigeria: Strategies and implications for HPV vaccine introduction. *Nig J Publ Health*. 2020; 4 (1): 27–35.
 13. Omobowale, O., Onadeko, M., and Owoaje, E. Socio-cultural beliefs and sexual activity among post-menopausal women in Ibadan Northeast local government area, Nigeria. *J Epidemiol Comm Health*. 2011; 65: A201 <https://doi.org/10.1136/jech.2011.142976g.73>
 14. Omobowale, O., Fowotade, A., and Iyanda, T. “It Is Divine Punishment for Our Sins” Knowledge and Perception of the Cause, Symptoms, and Mode of Transmission of the COVID-19 Disease Among Local Traders in Nigeria. *J Res Health*. 2022;12(1): 9-16. doi:[10.32598/jrh.12.1.1956.1](https://doi.org/10.32598/jrh.12.1.1956.1)