Uptake and Barriers of HPV Vaccine by 10-Year-Old School-Going Girls in Kisumu County, Kenya

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ABSTRACT

Background: Cervical cancer is the most common gynaecological cancer and a significant cause of Disability-Adjusted Life Years (DALYs). It is estimated that 85% of cervical cancer cases are in low- and middle-income countries. Kenya became the 16th African country to introduce the HPV vaccine into its routine immunization schedule. The main hindrance was initially the cost, but even as the vaccine has been rolled out free of charge, we still have acceptability and uptake challenges.

Objectives: To determine the uptake of the HPV vaccine by 10-year-old school-going girls in Kisumu County and to assess the factors associated with parental acceptability of the HPV vaccine in Kisumu County, using the Health Belief Model.

Methods: We conducted a mixed-method analysis of the uptake of the HPV vaccine by 10-year-old school-going girls in Kisumu County and the factors affecting parental acceptability. The study's first phase was a cross-sectional quantitative study, where secondary data of randomly sampled 384 girls, ten years of age, was collected from the school registry retrospectively between December 2019 and December 2021. A descriptive analysis was conducted. The results were presented in frequency and percentage. 34 parents purposively sampled for the FGDs. Transcripts were analyzed from the four focus groups in rural and urban Kisumu.

Results: The average uptake of the HPV vaccine in Kisumu County was (252) 65.63% (n=384). Only (119) 30.98% were fully vaccinated, while 26.82% (103) were partially vaccinated. 34.37% were not vaccinated during the study period.

Upon analysis of the qualitative data from the focused group discussion (FGDs), four main themes emerged as regards the HBM: the lack of knowledge and misinformation about Human Papillomavirus, cervical cancer, and the HPV vaccine, the fear of the HPV vaccine side effects, non-vaccine costs like transportation cost and institutional barriers like availability of the vaccine and proximity to a facility offering the vaccine services.

Conclusion: The study confirms that the HPV vaccination uptake is low, especially for the two doses. The study findings indicate that many parents and guardians did not possess vital information regarding the HPV vaccine that would enable them to allow their daughters to receive the vaccine.

Recommendations: It is, therefore, imperative that policymakers investigate and verify the efficacy of a single dose of the HPV vaccine and shift to one dose, and also employ other modalities of HPV vaccination campaigns to include door-to-door campaigns. Moreover, vital information regarding the causal relationship between the HPV cervical cancer and the HPV vaccine, and the side effects should be part of the disseminated information to the target groups.

Keywords: HPV vaccine, Health belief Model, Kisumu County

BACKGROUND

Human papilloma Virus (HPV) HPV infection causes a spectrum of manifestations ranging from inapparent symptomatology to serious cutaneous and mucosal manifestations that are premalignant to malignant disease (Magalhães et al., 2021). Of great importance are the high-risk HPV sub-types that are responsible for cervical

cancer. For this reason, we will use cervical cancer as the medical condition to which the intervention (HPV vaccine – Gardasil 4) is aimed at preventing rather than the virus itself. It is, however, important to note from the offset that the HPV vaccine is, infact , against the virus, whose infection has been identified as the most important factor in the pathogenesis of cervical cancer.

Of all the cancers, cervical cancer is the "most" preventable and treatable cancer (Rajkumar, 2018), and that is only possible when screening and vaccination are correctly carried out. In developed countries, it is recommended that screening for cervical cancer with a Pap smear is initiated at 21 years, and this is performed alongside HPV screening and vaccination for girls aged between 9 and 13 years—just before their sexual debut. In Kenya, an LMIC country, screening for cervical cancer targets women between 25 years and 49 years, with women between 50 years and 65 years receiving screening every five years on their resources. Screening is done on a 5-year basis for HIV-negative women, while HIV-positive women get screening annually. HPV DNA testing is recommended for women above 30 years of age. Where HPV testing is not yet available, or loss-to-follow-up is a risk, then Visual Inspection with Acetic acid (VIA) and Visual Inspection with Lugol's iodine (VIA/VILI) is recommended as the primary screening method. These interventions performed well and effectively, have lowered the incidence and mortality rates in well-resourced countries (Hull et al., 2020). Unlike high-income economies, LMICs are still reeling under the burden of cervical cancer, and this is attributed to factors such as inadequate trained personnel to conduct screening on the populations, poorly resourced laboratories, and insufficient information among eligible populations, among other factors (Cubie et al., 2020).

Statement of the Problem

"One woman dies of cervical cancer every two minutes. Each one is a tragedy, and we can prevent it." Dr. Tedros Adhanom Ghebreyesus, Director-General, World Health Organization (World Health Organization, 2020)

HPV has been an established causative agent in Cervical Cancer (Sankaranarayanan et al., 2004). This causal association has led to the development of vaccines against the HPV types responsible for cancer development (Porras et al., 2020). A successful vaccination program ensuring complete vaccination of 90% of girls by 15 years of age would result in a 10% fall in Cervical Cancer Incidence by 2030, a 20% fall by 2045, and a 90% fall by 2120 (World Health Organization, 2020).

Despite the critical role that HPV vaccination plays in the prevention of cervical cancer, vaccination coverage remains a significant challenge, with LMICs being the worst disadvantaged. In a pooled analysis to establish global estimates of HPV vaccination coverage by income level and region, Bruni et al. demonstrated that between June 2006 and October 2014, only 64 countries nationally, four countries sub-nationally, and 12 overseas territories had fully incorporated HPV vaccination into their immunization schedules (Bruni et al., 2016). Through these programs, a total of 118 women had been targeted for vaccination, but only 1 percent from low and middle-income economies (Bruni et al., 2016), an indication that HPV vaccination in LMICs is still poorly carried out, leaving a majority of the womenfolk vulnerable to HPV infection that eventually leads to cervical cancer.

Kenya is one of the eleven (11) LMICs that had introduced the HPV vaccine into its immunization schedule by 2019 (PATH, 2019). While the program is facility-based in Kenya, Kisumu County adopted a blend of school- and facility-based approaches. Most vaccinations are done as a campaign in schools. A study done by Vermandere et al. in Eldoret, Kenya, among mothers of eligible daughters showed an uptake of 47-52% (Vermandere et al.,2016). A study done by Mabeya et al. in Eldoret among school-going children showed an uptake of 40% for all three doses of the HPV vaccine (Mabeya et al., 2018). Data published on the DHIS2 website, which utilizes data from National Vaccines and Immunization Programs (NVIP) and Clinton Health Access Initiative (CHAI) Kenya, estimated the uptake of the HPV vaccine to be 13% by the end of 2021. The results in these studies show low uptake of this noble preventive measure and therefore recommend more qualitative studies that would be able to assess the factors affecting the uptake of this noble preventative measure.

Therefore, this study seeks to investigate the uptake of the HPV vaccine among school-going girls aged ten years between 2019 and 2021 and qualitatively assess the factors associated with acceptability and the decision to take up the vaccine using the Health Belief Model theory.

Study Objective

To determine the uptake and barriers of the HPV vaccine in the government rollout program among 10-year-old girls , Kisumu County, Kenya.

METHODS

Study Design

A mixed-method approach was employed to address the study objectives set in this study

The quantitative phase utilized a cross-sectional design, while the qualitative phase used Grounded Theory (Strauss et al. J, 1998). Data on the vaccination status of eligible girls was acquired from the school registry

Focus group discussions were used to gain an in-depth understanding of the barriers, cues, or motivations to take up the HPV vaccine.

Each focus group discussion comprised eight (8) to ten (10) participants. The focus group discussions were conducted in urban and rural Kisumu sub-counties. The focus group discussion participants were guardians/parents of 10-year-old girls attending selected schools in Kisumu County.

Qualitative arm in form of focused discussion groups to contextualize these factors by unearthing the themes behind them.

A mixed-methods cross-sectional study that includes both a quantitative and qualitative arm combines data collection and analysis from both numerical and non-numerical approaches to provide a comprehensive understanding of a research problem at a single point in time.

Cross-sectional Design:

The study is conducted at one specific point in time or within a short timeframe, without longitudinal follow-up.

Quantitative Arm:

Data Collection: Data was collected using a structured questionnaires to measure variables like demographic data, behavioural assessments and clinical data.

Analysis: Statistical methods using SPSS version 25 was used to analyze the data, such as descriptive statistics, regression and hypothesis testing. The goal was to identify patterns, correlations, or trends.

Qualitative Arm:

Objective: To gain deeper insights into participants' experiences, perceptions, and meanings behind the quantitative data.

Data Collection: This involved interviews, focus groups, and open-ended survey questions.

Analysis: Qualitative data was analyzed through thematic analysis, coding, or narrative analysis. The focus is on understanding context, meanings, and complexity.

Study area

The study area was Kisumu County in the Lake Basin region of Kenya.

Consent

We employed an opt-in (active consent) approach for guardians of the girls selected for the study's first phase, where we informed the participants about the research and sought their permission.

Ethical approval was sought and obtained from Moi University and Moi teaching and referral hospital Institutional and ethics committee and from Kisumu county..

RESULTS

Quantitative Phase

Overall Hpv Vaccine Uptake

The HPV vaccination program in Kisumu is widely a blend of school-based and facility-based approaches. The vaccinations are done as outreach campaigns by the neighboring facility. During our visits to the facilities, it was noted that the majority of girls were vaccinated during the campaigns in the respective schools. This meant that during the COVID-19 pandemic, most eligible girls did not receive the vaccine as scheduled due to lockdowns and closure of schools. The county government, in return, coupled COVID-19 vaccination campaigns with a catch-up HPV vaccination campaign.

The average uptake of the government rollout of a blend of school-based and facility-based HPV vaccination in Kisumu County was 63% (n=384). Only (119) 31% were fully vaccinated, while 26.82% (103) were partially vaccinated. 37% were not vaccinated during the study period.

Hpv Vaccination Trends

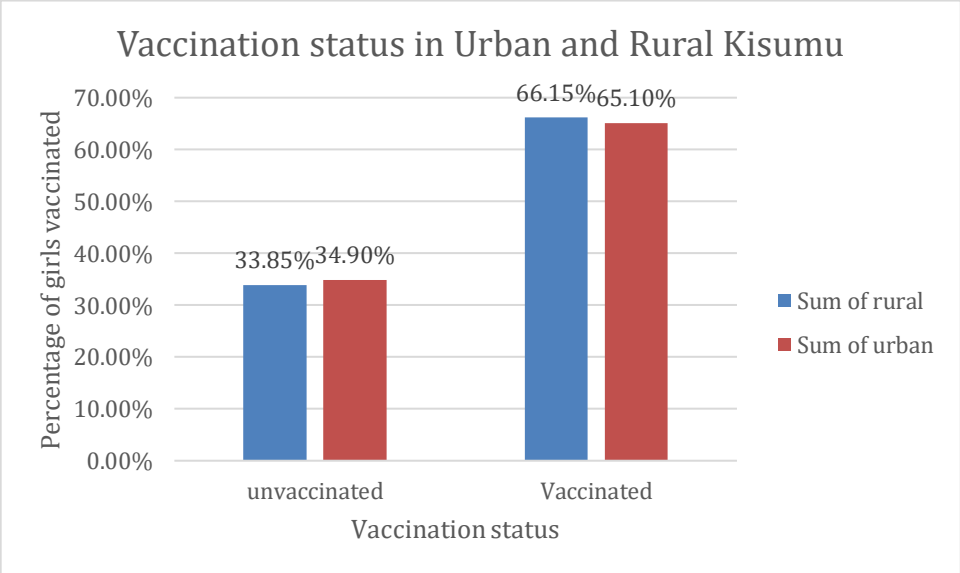

Figure 1: Vaccination status in Kisumu county

Hpv Vaccination Trends In Rural Kisumu

The average uptake of at least one dose of the HPV vaccine in Rural Kisumu was (127) 66.1%, with approximately (85) 44.27% being fully vaccinated and (65)33.9% being unvaccinated. At the beginning of the government rollout of the vaccination program in 2019, the uptake of at least one dose of the HPV vaccine was

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approximately 45.31%. In 2020, there was a slight increase in the uptake of at least one dose of the HPV vaccine to about 50%, but a worrying drop In the uptake of two doses of the HPV vaccine to 28.13%

Hpv Vaccination Uptake In Urban Kisumu

The average uptake of at least one dose of the HPV vaccine in the urban setup in Kisumu was (95) 67%, out of which only (34) 18% received both the first and the second dose.

During January 2019 and December 2021, the uptake of the HPV vaccine recorded a steady improvement for girls getting at least one dose of the vaccine. The second dose, however, still recorded very low uptake.

The majority of the study participants were female (76.5 %). Most of them were above 30 years old, with the majority having post-secondary education.

Qualitative Phase

Perceived benefits of HPV vaccine

This subtheme assessed the participants' perception of the perceived benefits of the HPV vaccine. The unvaccinated group (FGD1 – rural and FGD2 – urban) and the vaccinated group (FGD3 – Rural and FGD4 – urban) believed the HPV vaccine would confer some protection against Cervical cancer.

'I feel she should get the two doses to offer her enough protection. (FGD1P8)'

'So as for them to get enough protection because they are the most susceptible to cervical cancer (FGD2P1).'

'Any girl must have a uterus, which grows as the girl grows. So, the vaccine will help her once she gets it (FGD3P5)'.

'Usually, there is the first dose and then the second dose. That is when one would have gotten both doses. It will offer full protection against the disease (cervical cancer). That is why one must get two doses (FGD4P6).'

Some rural vaccinated cohort respondents said they were following the doctor's instructions.

'The doctor knows why he has told you so…I feel like you should just take HPV for two doses (FGD3P6).'

It is pretty evident from most of the respondents that while most thought it was essential to get the HPV vaccine, many parents are not fully aware of the benefits attributed to the HPV vaccine. Therefore, this construct cannot understate the significant theme of knowledge and inadequate information.

Perceived barrier to HPV vaccine

This subtheme investigated the perceived barriers to allowing their daughters to be vaccinated against HPV. Among the unvaccinated rural respondents, the theme of lack of knowledge and inadequate information was mentioned many times, especially touching on potential harm or side effects of the HPV vaccine. 'It could harm the child because you may not know much about the product and its origin. Some people use people to test their products, and one may not be sure if the research done with people using the product was successful (FGD1P3)'. Their Unvaccinated urban cohort also reiterated this: 'I might be worried, but if I get more information about cervical cancer and that vaccine, I would just open up and take my daughter for vaccination. (FGD2P8)'.

The theme of potential side effects was evident among the unvaccinated group in both the urban and rural setup. Especially the fear of future infertility in the vaccinated girls. 'After vaccination, what will be the reaction to the child, maybe weakness and things like that? That is what might make me fearful. (FGD1P7)'

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'Some will say that if you take the girl for vaccination, she may never give birth, and things like that. (FGD2P6)'

While the government rollout is free of charge, the cost theme still came up, especially in the unvaccinated cohort. 'It will depend on what they have said about the vaccination, like if you are to pay for it. You might find that it costs 2,000 shillings, but because you value your child, you will have to pay the cost so that she can have that vaccine (FGD1P5)' Which probably meant they did not have accurate information on the HPV vaccine.

Among the urban unvaccinated cohort, the themes of transportation cost (distance), availability, and busy work schedule emerged as potential barriers. 'It can be an issue because sometimes you can be told by the ministry that you can get the vaccine in the nearest facility, but when you go there, you find that they are out of stock, and you now have to move to another facility, and one might not have the money for it (FGD2P6).'

'The cost of transportation is also a barrier? (FGD2P10)'

'Now, for example, if you wanted to take your daughter for vaccination and you are probably busy because you have to go to work or you are busy at home, that is a barrier. (FGD2P5)'

Among the rural vaccinated group, accessibility, availability, and lack of information themes were adversely mentioned. 'Sometimes the place where the vaccination is being offered is too far. Sometimes we would like those offering the vaccination services to come closer to where we are (FGD3P6).'

The theme of availing information to the male guardians in the rural vaccinated cohort was mentioned, underlining the role of the family in getting the girls vaccinated. 'So, that is also a barrier, and therefore, it is important for men also to get information about the importance of these kinds of services. Some of us have already spoken about some of the barriers that can exist some of us have already spoken about them. It is only that health education concerning this (vaccination) should not be offered only to women. However, it should also include men because children have different attributes at home. Some lean toward me, and others lean toward the father. Some men are very harsh (FGD3P4).'

Among the vaccinated urban cohort, the central theme was the fear of side effects in their daughters. 'One of the reasons some parents may not allow their children to get the vaccine is a lack of knowledge since these parents believe that injections ruin their children (FGD4P1). You know you could be in a place where people will discuss its advantages and disadvantages. Now, someone could ask about the advantages of the vaccine and the disadvantages or drug reactions after getting the vaccine. What about the reaction? (FGD4P3)'.

One respondent highlighted the side effects and lack of information themes: 'I do not know what happened when my daughter got the vaccine because she got vaccinated in another secondary school. She stayed for about two weeks, and she looked sickly. I inquired what was happening to her, and she told me that she had been feeling unwell since she got the vaccine. I then asked her why she went for it because I did not have any information about the importance of the vaccine. So, I asked her why she did not ask me before getting it, and then she told me that she was forced to. So, parents may get scared because it makes the children sick (FGD4P9).'

'I would like to say that you should first educate people so that even if the child experiences side effects after getting it, you would be aware that it is one of the vaccine's side effects even though it would still help her. Now I think you should give us information about it first (FGD4P6).'

Cues to taking up Vaccination

This construct of the Health Belief Model assessed the cues that would make the guardians take their daughters to get the HPV vaccine.

Among the unvaccinated rural (FGD1) and urban cohort (FGD2), the theme of accurate information to the parents was emphasized. 'I just feel that giving people information. Anything that you have been given

information about and understand, you could never resist. You may not now resist taking your daughter for vaccination. (FGD1P5)'

'As long as you have the right information, then you can explain to the child what it is all about and even be able to take her for the vaccination (FGD1P3).'

'I would like you to talk to people. However, not only in groups, you can also go to the radio or even TV so that others too… some people live in remote parts of the country. The ones that you are not able to reach. They may get the information through radio so everybody has the right information (FGD2P6).'

'You know you could be in a place where people will discuss its advantages and disadvantages. Now, someone could ask about the advantages of the vaccine and the disadvantages or drug reactions after getting the vaccine. What about the reaction? (FGD2P3)'

'Just talking with the parent, giving her information so that she understands it deeply. That would motivate her to accept. (FGD2P8)'

The Information dissemination theme was also emphasized among the rural (FGD3) and Urban (FGD4) vaccinated. 'I can say that you should educate us before the vaccination is rolled out. You know, once there is education, I can encourage my spouse to go together for it so that one day we will not have any challenges in case we want to take our daughter for the vaccine; as you know, there are many disagreements in marriages (FGD3P1).'

'The benefits of the messages you know when one is given the information, she will be told about the vaccine's benefits in their bodies. You know, you cannot just come and tell someone that you would like to vaccinate them, but you do not tell them what you are vaccinating them against. So, you have to tell them what the vaccine prevents and what its benefits are. So that is something they must know about (FGD4P1).'

'Once I have the information, I will know what it does. If I get the vaccine, what is it preventing me from? How is it going to offer me prevention? (FGD4P2)'.

'The messages should be about…because I heard about what the first and second doses do. So, the messages should be able to address what the first dose of the HPV vaccine is all about and the same to the second dose (FGD4P3).'

DISCUSSION

Uptake of HPV vaccine in Kisumu County

The results of the study revealed that HPV vaccination coverage under the national vaccination and immunization program was at 65.6% for at least a single dose of HPV vaccine, but 30.98% received the full/complete doublet dose of Gardasil 4 HPV vaccine, which is way below the 90% WHO target on the mathematical model and the Kenyan target of 80%.

The findings of this study differ markedly from those of Beyen et al. In a study in 2022 in Ambo town, Oromia region, Ethiopia, which showed uptake of at least one dose of the HPV vaccine to be 44.4%, while that of two doses of the vaccine to be 21% (Beyen et al., 2022). This study, however, looked at adolescent girls between 14 and 18 years, while our study was only specific to 10-year-olds.

A study done by Genet Hailu et al. in Nekemte City, West Ethiopia, showed a similar uptake rate of 61.2% getting at least one dose and 45% getting both doses of the HPV vaccine in adolescent girls in high schools in the city (Hailu et al., 2023). The study area in this study is a peripheral city in a western zone away from the capital city, Addis Ababa. While Ethiopia has not included the HPV vaccine in its national immunization program, It still provides the vaccine to 14-year-olds attending schools.

The uptake of the HPV vaccine is still very low despite a significant reduction in the cost of accessing the vaccine. Moreover, there is an especially problematic uptake of the second dose of the vaccine. New evidence based on a randomized controlled trial in Kenya has demonstrated 98% protection against HPV 16 and 18 (Barnabas et al., 2022). Perhaps efforts should shift to providing a single dose of the HPV vaccine and channeling funds to availing the vaccine in all facilities.

Perceived barrier to HPV

The barrier to successful HPV vaccination is most frequently related to the scarcity of resources, such as the lack of materials to raise awareness, inadequate cold chain capacities, lack of personnel, and limited capacities for managing possible adverse events (Kutz et al., 2023).

The results of our study highlighted a lack of or misinformation regarding HPV, cervical cancer, and the HPV vaccination services as a barrier to taking up vaccination. Limited knowledge of HPV and its pathogenesis was identified as a barrier. Lack of HPV awareness cannot only affect individuals' understanding of the need for vaccination but also limit HPV health literacy among parents and guardians; for instance, it can also affect the quality of HPV vaccination information sessions and among parents to consent to the vaccination of their children. Moreover, misinformation about, for example, vaccine side effects and the safety of the vaccines was another obstacle to vaccination. Milondzo et al. identified misinformation as the primary driver of negative attitudes towards HPV vaccination, which resulted in low vaccination rates during their study.(Milondzo et al., 2021)

The belief that HPV vaccination could affect girls' fertility represented a substantial barrier to vaccination. Heleen Vermandere and colleagues mentioned fear of future fertility complications as an adverse driver of the uptake of the HPV vaccine. (Vermandere et al., 2015) Numerous recent studies have shown no association between the HPV vaccine and infertility in women (Schmuhl et al., 2020). Education programs should thus include this message disassociating the HPV vaccine from infertility in their material for the public.

CONCLUSION

The uptake of at least one dose of the HPV vaccine, Gardasil 4, in the government rollout, is still underwhelming at 65.6%, despite the significant reduction in the cost of accessing the vaccine.

The findings of this study have highlighted the gaps that have undermined the uptake of the HPV vaccine. The overarching theme from our FGDs was knowledge about HPV, cervical cancer, and the HPV vaccine. Generally, inaccurate knowledge and lack of knowledge about the sub-themes negatively impacted parental (guardian) acceptability of the HPV vaccine. There were perceived barriers, especially potential side effects, distance to facility, and cost of transportation in the Health Belief Theory constructs, brought about negative behavioral change regarding their acceptance of the HPV vaccine. The participants of the FGD also opined that HPV vaccine education programs have not been aggressive enough, and the information therein lacked some information that would positively impact their decision to take up the vaccine.

RECOMMENDATIONS

A more robust awareness campaign should be initiated advocating for the HPV vaccine as the primary prevention measure for cervical cancer. Strengthening education campaigns is required to disseminate information about HPV vaccines among target girls, parents, and the community. This step should employ community mobilization strategies such as targeting audiences in social and religious gatherings and mass media.

The government should aggressively inform the public about the health facilities where the vaccine is available and the ongoing mixed school and facility-based campaigns and vaccinations.

Our study underlines gaps that awareness campaigns need to be increased to address vaccine safety concerns and educate the community that HPV is an STI that affects both men and women. This campaign must be an

integral aspect of primary healthcare where all the community leadership, social, and religious structures are involved in disseminating this vital information.

REFERENCES

1. Aldohaian, A. I., Alshammari, S. A., &Arafah, D. M. (2019). Using the health belief model to assess beliefs and behaviors regarding cervical cancer screening among Saudi women: A cross-sectional observational study. BMC Women's Health, 19(1). https://doi.org/10.1186/s12905-018-0701-2
2. Arbyn, M., Weiderpass, E., Bruni, L., De Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2020). Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. The Lancet Global Health, 8(2), e191-e203. https://doi.org/10.1016/s2214-109x(19)30482-6
3. Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. (2018). Global cancer statistics 2018: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: A Cancer Journal for Clinicians, 68(6), 394-424. https://doi.org/10.3322/caac.21492
4. Bruni, L., Diaz, M., Barrionuevo-Rosas, L., Herrero, R., Bray, F., Bosch, F. X., De Sanjosé, S., &Castellsagué, X. (2016). Global estimates of human papillomavirus vaccination coverage by region and income level: A pooled analysis. The Lancet Global Health, 4(7), e453-e463. https://doi.org/10.1016/s2214-109x(16)30099-7
5. Hull, R. L., David-West, G., Maza, M., Hartmann, B., Shirazian, T., & Cremer, M. (2020). Cervical cancer in low- and middle-income countries. Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine, 78(3), 319-326. https://doi.org/10.1002/msj.20263
6. Liddon, N., Hood, J., Wynn, B. A., & Markowitz, L. E. (2010). Acceptability of human papillomavirus vaccine for males: a review of the literature. Journal of Adolescent Health, 46(2), 113-123.
7. Parkin, D. M., Almonte, M., Bruni, L., Clifford, G., Curado, M., & Piñeros, M. (2013). Burden and trends of type-specific human papillomavirus infections and related diseases in the Latin America and Caribbean region. Vaccine, 26, L1-L15. https://doi.org/10.1016/j.vaccine.2008.05.043
8. Porras, C., Tsang, S. H., Herrero, R., Guillén, D., Darragh, T. M., Stoler, M. H., Hildesheim, A., Wagner, S., Boland, J., Lowy, D. R., Schiller, J. T., Schiffman, M., Schussler, J., Gail, M. H., Quint, W., Ocampo, R., Morales, J., Rodríguez, A. C., Hu, S., … Stoler, M. H. (2020). Efficacy of the bivalent HPV vaccine against HPV 16/18-associated precancer: Long-term follow-up results from the Costa Rica vaccine trial. The Lancet Oncology, 21(12), 1643-1652. https://doi.org/10.1016/s1470-2045(20)30524-6
9. Sankaranarayanan, R., Basu, P., Wesley, R. S., Mahe, C., Keita, N., Mbalawa, C. C., Sharma, R., Dolo, A., Shastri, S. S., Nacoulma, M., Nayama, M., Somanathan, T., Lucas, E., Muwonge, R., Frappart, L., & Parkin, D. M. (2004). Accuracy of visual screening for cervical neoplasia: Results from an IARC multicentre study in India and Africa. International Journal of Cancer, 110(6), 907-913. https://doi.org/10.1002/ijc.20190
10. Tashakkori, A., & Teddlie, C. (2010). SAGE handbook of mixed methods in social & behavioral research. SAGE.
11. Vermandere, H., Naanyu, V., Mabeya, H., Vanden Broeck, D., Michielsen, K., &Degomme, O. (2014). Determinants of acceptance and subsequent uptake of the HPV vaccine in a cohort in Eldoret, Kenya. PLoS ONE, 9(10), e109353. https://doi.org/10.1371/journal.pone.0109353
12. WHO director-general calls for all countries to take action to help end the suffering caused by cervical cancer. (2018, May 19). World Health Organization. https://www.who.int/reproductivehealth/call-to-action-elimination-cervical-cancer/en/
13. Wilson, R. (2021). HPV vaccine acceptance in West Africa: a systematic literature review. Vaccine, 39(37), 5277-5284.