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Review Article

Examining the Challenges and Strategies for Improving Cervical Cancer Screening in Nigeria

Solomon Matthias Gamde[1], Olatunde Sharon Omotola[1], Godwin O Avwioro[2], James O Adisa[3]

Abstract

Background: Cervical cancer is one of the most treatable cancers when detected early and managed. Unfortunately, the mortality rate is projected to surge in Nigeria. ***Objective:*** This review aims to provide updated information on challenges and strategies for improving cervical cancer screening in Nigeria. ***Methods:*** In this review, scientific papers published in electronic databases including PubMed, Scopus, and Google Scholar were retrieved using search themes such as "cervical cancer", "risk factors", and "preventive methods" were examined. ***Results:*** The true prevalence of cervical cancer is underestimate in Nigeria because most cases of cervical cancer are not documented. Lack of awareness, cultural barriers, poor infrastructure, unfavorable perception, shortage of supplies, lack of partner involvement, provider-related factors, poor monitoring, and evaluation system were the major barriers that hinder cervical cancer screening service in Nigeria. ***Conclusion:*** Lack of awareness, unfavorable perception, problems with health system structure and process, and cultural conditions were major barriers in Nigeria. Hence, packages of intervention is necessary create awareness, provide essential equipment, increase access to health facilities, and strengthening follow up system is indispensable for service improvement by the government and non-governmental organizations, world health organization inclusive.

Keywords: Cervical cancer, screening, barrier, Nigeria

International Journal of Human and Health Sciences Vol. 08 No. 01 January'24
DOI: http://dx.doi.org/10.31344/ijhhs.v8i1.616

Introduction

Cervical cancer is the second-most common cancer in women worldwide that affects the cervix, which is the opening to the uterus from the vagina but 80% of cases occur in developing countries[1]. In 2018, about 570,000 women were diagnosed with cervical cancer in the world which claims the lives of more than 311,000 women each year, especially in developing countries. In Nigeria, an estimated 12,075 cervical cancer cases are reported with over 7,968 deaths annually[2]. This figure is an underestimate because most cases of cervical cancer are not documented. Without proper implementation of the new strategies to prevent the disease, the death toll is expected to increase to 400,000 while the annual number of new cases to 700,000[2].

Human papillomavirus (HPV) which is transmitted through sexual contact is reported to be the most common cause of cervical cancer. To prevent cervical cancer, several studies [3] have been conducted on the knowledge and utilization of cervical cancer screening in Nigeria. The HPV vaccine is now available for primary prevention and to reduce the risk of developing cancer. When cervical cancer is detected early and managed, it is one of the most treatable forms of cancer. However, the screening rate for cervical cancer is far below the set target by the WHO[2]. Study conducted by The Lancet has revealed that an estimated 44 million women in the world are at risk of developing cervical cancer between 2020

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and 2069. In addition, the number of deaths resulting from cervical cancer was projected to surge by 50% in the year 2040 with a profound effect. However, the World Health Organization has estimated that cervical cancer could be the first cancer to be eradicated if over 90% of girls are vaccinated against HPV, 70% of women undergo screening, and 90% of women with the disease receive proper treatment[4]

In Nigeria, many studies have explored the major socioeconomic factors affecting the knowledge, attitude, and perception of cervical cancer among women[5]. Although several Nigerians are aware of the disease through social media, school, workplace, friends, family members, and medical personnel[6]surprisingly, there are still misconceptions, lack of understanding, and low perception of cancer risk, poverty, and physician gender preference are among the common factors causing the low interest in screening for it. Some people do not even know what the screening is for[7]. Furthermore, the lack of spouse support and the belief that cancer is a death wish, including societal discrimination are some of the shared sociocultural barriers to cervical cancer screening [8]. It is on this background, that we would examine the challenges and strategies for improving cervical cancer screening in Nigeria.

Methods

The present review was carried out in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review (PRISMA-ScR) guidelines. In this review, scientific papers published in electronic databases including PubMed, Scopus, and Google Scholar were retrieved using search themes such as cervical cancer, risk factors, screening, and preventive methods were examined. Scientific papers published in electronic databases that were unable to be downloaded were excluded in the review. The remaining references were filtered to ensure only articles covering the search themes were examined in this review.

Results and Discussion

Cervical Cancer: Cervical cancer develops in the cervix as cells multiply uncontrollably, invading other parts of the body. This is the fourth most common form of cancer among women worldwide, with about 604,000 new cases and 342,000 deaths reported in 2020 [9] In high-income countries, programs are available to vaccinate girls against HPV and to provide regular screening and treatment for women. Cervical cancer screening helps identify pre-cancerous lesions that could be treated. In contrast, in low- and middle-income countries, access to these preventative measures is limited, which means cervical cancer is often not detected until it has advanced, and lethal symptoms have already developed. Furthermore, access to cervical cancer treatment options such as cancer surgery, radiotherapy, and chemotherapy may be restricted, resulting in a higher death rate from cervical cancer in these countries. Therefore, adequate measures must be implemented to reduce the high rates of cervical cancer mortality[10]

Anatomy and Physiology of the Cervix: The anatomic cervix consisting of the ectocervix and endocervix has an average length of 3-4cm and a width of 2.5cm. The ectocervix is the portion of the cervix projecting into the vagina, divided into the anterior and posterior lips composed of non-keratinized stratified squamous epithelium. The squamous-columnar junction is the area where the epithelial cells of the endocervix and ectocervix meet [1]. In this region, the columnar cells of the endocervix undergo metaplasia to the squamous cells of the ectocervix. The opening of the ectocervix to the vagina is called the external os, although studies of cervical length in non-pregnant women are few, it is acknowledged that the size and shape of both the cervix and the external os differ in women [4,8] and vary with age, hormonal changes, parity, and surgical treatments to the cervix. The tube between the external os and the uterine cavity is called the endocervical canal, and the endocervical canal's columnar epithelium comprises a single layer of mucin-secreting cells [10]. In addition, the stroma of the cervix is made up of dense, fibro-muscular tissue which in turn is made up of collagenous connective tissue, smooth muscle elastic tissue, and ground substance—glycosaminoglycans which produce abundant secretory products which are mostly mucin glycoproteins.[11]

Epidemiology of Cervical Cancer: Cervical cancer is a significant public health issue, it is the fourth most common cause of cancer incidence and mortality among women around the world. While there has been a decrease in its ranking globally, the incidence and mortality rates are still on the rise. In 2000, cervical cancer was the second most common cancer among women with 468,000 cases and 233,000 deaths per annum. In 2008, cervical cancer ranked third most common cancer

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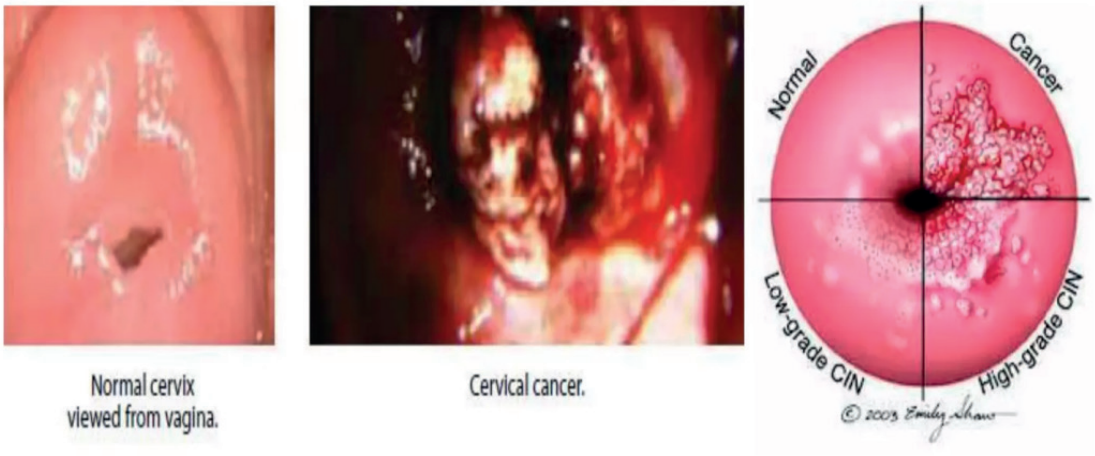

Figure 1: Normal and lesions in the Cervix[25]

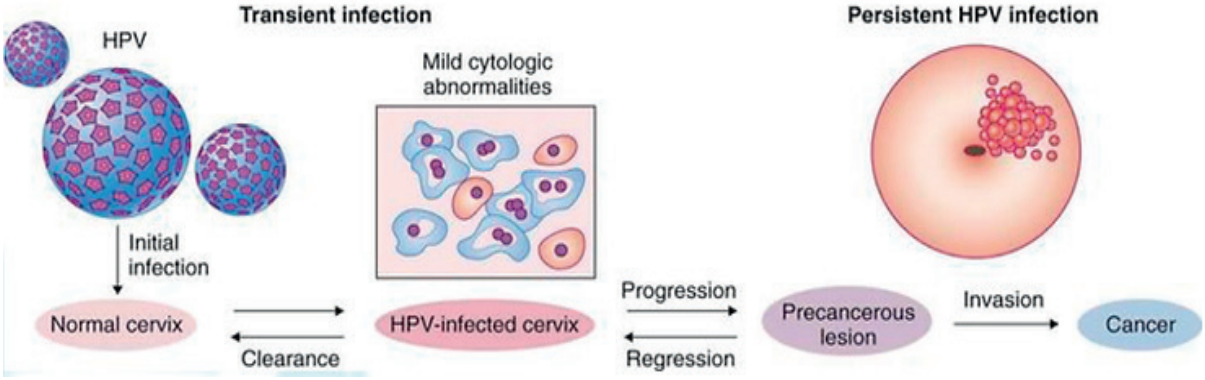

Figure 2: Sequence of cervical cancer development

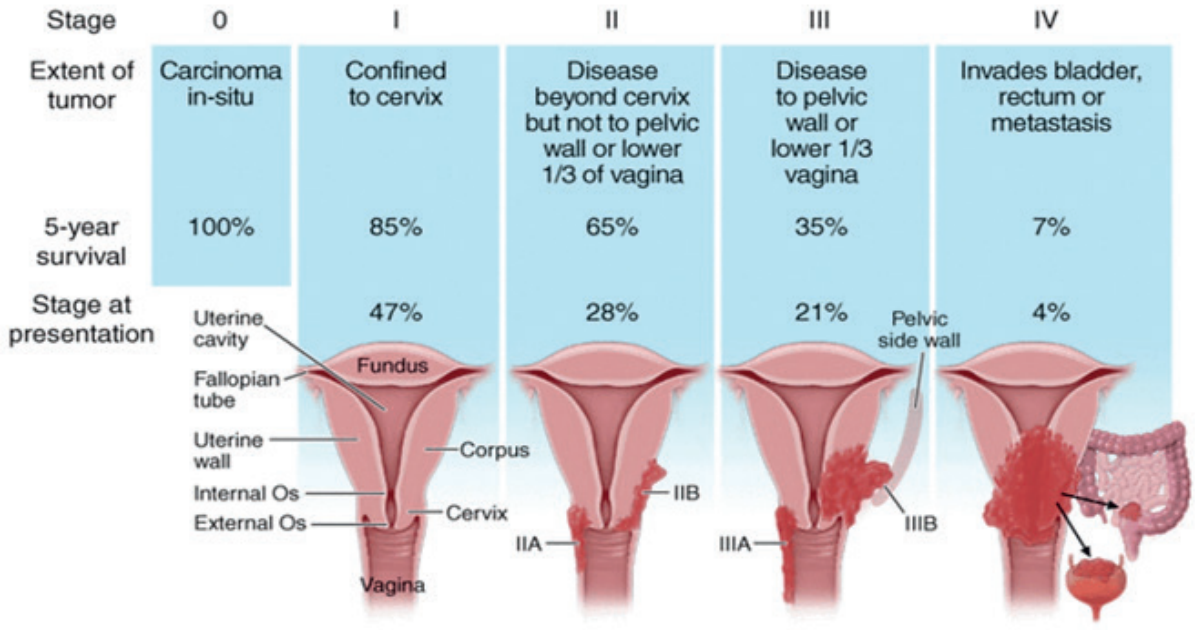

Figure 3: Stages of cervical cancer[25]

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in women with 530,000 new cases and 275,000 deaths whereas in the year 2018, there were over 570,000 new cases globally causing about 311,000 deaths. Although the incidence of cervical cancer has decreased in most regions of the developed world, Africa remains the leading cause of cancer-related death among women accounting for about 84% of new cases and 88% of deaths[12].

In Nigeria, cervical cancer is the second most common cause of cancer-related deaths among women, and each year, an estimated 14,943 women are diagnosed with the disease with over 10,403 deaths. In 2018, cervical cancer alone accounted for 12.9% of new cancer cases and 14.8% of cancer-related deaths in Nigeria. Moreover, there were about 12,075 new cases reported with over 7,968 deaths in 2020. It was estimated that over 50.33 million women aged 15 years and above are at risk of developing the disease in Nigeria[12].

Research conducted by The Lancet has revealed that an estimated number of about 44 million women worldwide are at risk of developing cervical cancer between the years 2020 and 2069. Moreover, the report warns that the number of deaths resulting from cervical cancer is projected to increase by 50% by the year 2040, which would have a profound impact on the population. However, the World Health Organization has estimated that cervical cancer could be the first cancer to be eradicated when 90% of girls are vaccinated against HPV, 70% of women undergo screening, and 90% of women with the disease receive proper treatment[4].

Human Papilloma Virus and Vaccines: HPV is one of the most common viral infections of the human reproductive tract. Most sexually active women and men would be infected at some point in their lives, and some may be repeatedly infected since cervical cancer is the most common HPV-related disease[13]. Almost all cases of cervical cancer were attributed to the HPV infection. Although most pre-cancerous lesions resolve spontaneously, there is a risk for all women that HPV infection may become chronic and pre-cancerous lesions progress to invasive cervical cancer, and it takes 15 to 20 years for a full-blown cervical cancer to develop in women with normal immune systems whereas only 5 to 10 years in women with debilitated immune systems as those with untreated HIV infection.[13]

Nowadays, HPV vaccines are used to control the spread of cervical cancer. Prophylactic HPV vaccines are prepared from L1 protein using recombinant DNA technology. The proteins induced host immune cells, vaccine-induced immunity is considerably stronger than immunity-mediated response via natural infection and consists of more cross-protection to non-vaccine-related serotypes. Vaccine-induced immune response was mediated by neutralizing immunoglobulin G antibodies and cellular immunity.

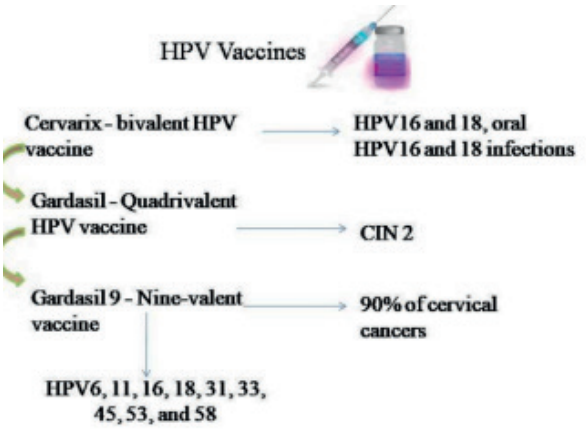

Figure 4: HPV Vaccine[14]

The most common vaccines for HPV infection are the Cervarix™ and Gardasil®. These vaccines varied based on compositions, the vaccines are available in glass vials at a storage temperate range is 2–8 °C and an intramuscular injection was endorsed at 0.5ml at a single stretch and the suitable period of HPV vaccination advocated prior exposure to the HPV infection, usually 11–12 years for girls. It is recommended to use Gardasil® for males between 9 and 26 years of age. The HPV antibodies would develop after three successive doses. Outcomes revealed that the antibody titer is maximum after the third dose of administration and the antibody level would remain higher than natural infection. Older women would remain at increased risk of HPV infection than younger women while young women and sexually naive girls would be the greatest beneficiaries of HPV vaccination in addition, recent studies revealed the benefits of HPV vaccines among older women. Gardasil® vaccine targets HPV types 6, 11, 16, and 18 as was approved in Europe and the US[9].

Risk Factors:

Some of the risk factors for cervical cancer include:

1. Previous HPV or other STIs
2. Having multiple sexual partners

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3. Use of oral contraceptives
4. Tobacco use
5. Being in a relationship with an uncircumcised male
6. Starting sexual intercourse at an early age
7. Weakened immune system

Symptoms of cervical cancer:

The early-stage symptoms include:

1. Irregular blood spotting or light bleeding between periods in women of reproductive age
2. Postmenopausal spotting or bleeding
3. Bleeding after sexual intercourse
4. And increased vaginal discharge, sometimes foul smelling.

As cervical cancer advances, more severe symptoms may appear including:

1. Persistent back, leg, or pelvic pain
2. Weight loss, fatigue, loss of appetite
3. Foul-smell discharge and vaginal discomfort
4. Swelling of a leg or both lower extremities

Other severe symptoms of cervical cancer would arise at advanced stages depending on which organs the cancer has spread to affect.

Cervical Cancer Screening: Cervical cancer screening involves testing for HPV infection to detect pre-cancerous and cancerous changes, followed by appropriate treatment. The screening test is done even among women with no symptoms of the disease. If screening detects an HPV infection or pre-cancerous lesions, they can easily be treated, and cervical cancer can be prevented. Cervical cancer screening would detect cancer at an early stage where the treatment has a high prospect for cure.

WHO has updated its guidelines and now encourages countries to use HPV tests for cervical screening, including HPV DNA and HPV mRNA tests, while HPV-DNA testing detects high-risk strains of HPV which cause almost all cervical cancers, the HPV mRNA detects HPV infections which could lead to cellular transformation. Unlike the tests that rely on visual inspection, HPV testing is an objective test that is simpler to perform, saves more lives, and averts more pre-cancerous and cancerous lesions. It is also more cost-effective than the visual inspection techniques or the cytology preparation, known as 'Pap smears.' Cervical cancer screening should begin from 30 years of age in the general population of women with regular screening, and a confirmed HPV test every 5 to 10 years. For women living with HIV, the screening should begin at 25 years of age, and they need to be screened more frequently every 3 to 5 years[14].

Laboratory Method for Screening Cervical Cancer:[15] Pap smear cells from the cervix are examined under a light microscope to determine whether they are normal, using the Papanicolaou staining method for cervical smears.

i) Procedure for collecting Pap smear:

To collect a sample for Pap smear examination, the following items are needed:

1. A sterilized dry bivalve Cusco speculum
2. Clean glass slides labeled with a diamond pencil
3. Sterilized cotton-tipped applicators, sticks, Ayres spatulas, or a Cervix brush
4. A wide-mouth specimen bottle filled with fixative (absolute alcohol) or commercial instant spray fixative
5. Normal saline
6. A glass marking diamond pencil
7. A hanging drop slide and 22 x 22 mm glass coverslips to check for *Trichomonas vaginalis*
8. A curved metal cannula or a disposable plastic endometrial aspirator in case of endometrial cytology

ii) Procedure for performing a cervical smear test:

1. Explain the procedure to the patient and obtain verbal or informed consent.
2. Instruct the patient to lie down in a lithotomy position, ideally on a PV table.
3. Insert a Sim's speculum or a bivalve Cusco's speculum into the vagina to expose the cervix, using gentle maneuvering of the speculum. The use of the Cusco speculum allows the practitioner to be "hands-free."
4. Gently but firmly insert the long end of the spatula or brush into the endocervical canal and rotate it clockwise through 360° two to three times. For the Cervix brush of the Surepath, rotate it five times. Reverse rotation is strictly prohibited with the cytobrush and Cervix brush, as it may leave behind the cells

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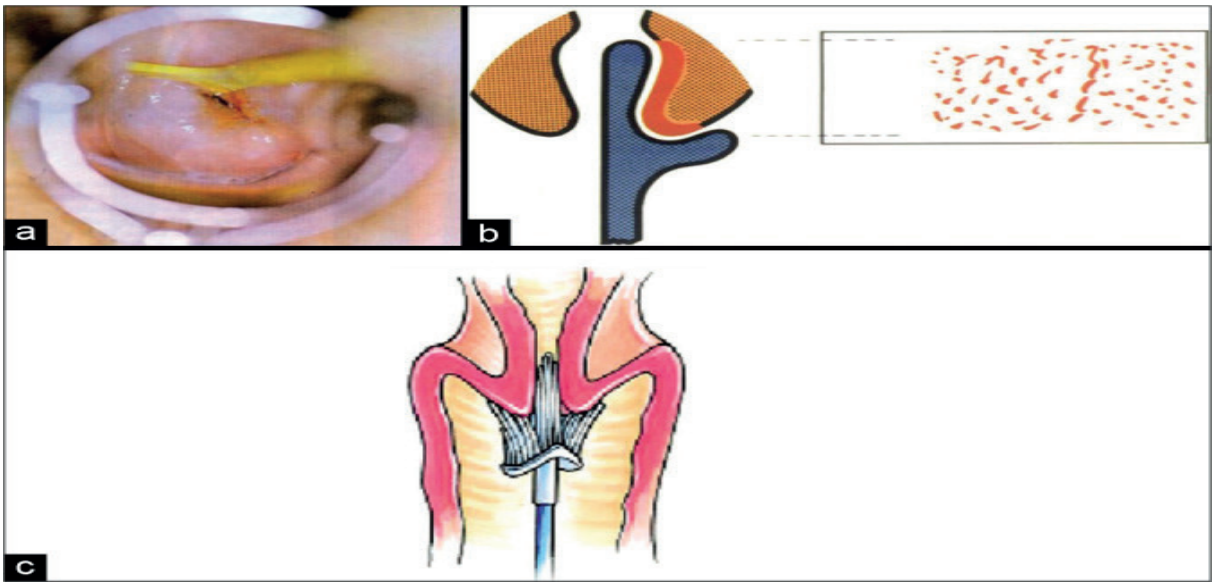

Figure 5: **Collecting Cervical Smear**[15]

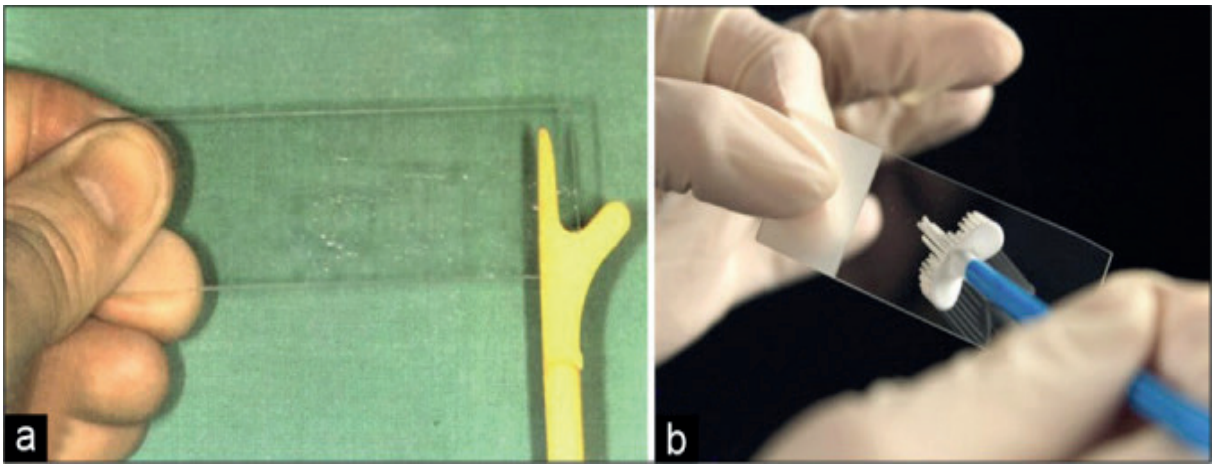

Figure 6: Cervical Smearing[15]

Figure 6: Fixing Cervical Smear[15]

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that were collected in the previous rotations.

5. Spread the collected material circularly or linearly in the central two-thirds area of the glass slide, leaving the edges free of material.
6. Immediately fix the conventional smear in absolute alcohol. Delay in fixation causes air drying artifacts and clouding of morphological details.
7. However, if there is a shortage of alcohol or constant failure to provide "good quality wet fixed smears," the smear may be air-dried and then rehydrated in the laboratory.
8. For spray fixing the slide, keep the spray at a 45° angle and six inches away from the slide.

It is expected that the requisition form should mention the mode of preservation of the slide since the steps in the processing of the smear in the laboratory are different depending on the mode of fixation of the smear.

iii) Procedure for Manual Staining:

1. Remove smears from fixative
2. Rinse in descending grades of alcohol (80%, 70%, and 50%) and water for 10 seconds each
3. Stain in Harris Hematoxylin for 2 minutes
4. Rinse in water for 1-2 minutes
5. Differentiate in 1% acid alcohol until only the nuclei retain the stain (a few seconds)
6. Wash and blue in tap water for 3-5 minutes
7. Transfer to 70% alcohol for a few seconds
8. Transfer to 95% alcohol for a few seconds
9. Stain in Orange G6 for 2 minutes
10. Rinse in 2 changes of 95%alcohol
11. Stain in Eosin Azure 50 for 2-4 minutes
12. Rinse in 2 changes of 95% alcohol
13. Dehydrate in absolute alcohol, clear in xylene, and mount in a neutral synthetic medium

Treatment of Cervical Cancer; Pre-Cancerous Stage: When pre-cancerous treatment is necessary, in addition to the eligibility criteria being met, it is recommended to undergo ablative treatment with either cryotherapy or thermal ablation. In either process, both treatments are safe and effective, they could be carried out in the outpatient clinic. For those patients who are ineligible for ablative treatment or who are suspected of having cervical cancer, it is crucial to refer them to the appropriate level of healthcare services so that they can undergo proper evaluation with colposcopy and biopsies[2]. Histopathological examination is necessary to diagnose cervical cancer and stage the lesions based on the size of the tumor and the spread of the disease, the treatment plan for cervical cancer is dependent on its stage which may include radiotherapy, surgery, and chemotherapy. However, palliative care is an indispensable element of cancer management to relieve the pain caused by the disease[13,16].

Challenges in Cervical Cancer Screening: Although several Nigerians are aware of the disease through social media, school, workplace, friends, family members, and medical personnel[6] surprisingly, there are still misconceptions, lack of understanding, and low perception of cancer risk, poverty, and physician gender preference are among the common factors causing the low interest in screening for it.

Inadequate knowledge of cervical cancer: Cervical cancer is now one of the biggest public health challenges in Nigeria. In a study conducted in Ilorin, Kwara State, of the 326 women involved in the study, 83.1% were aware of cervical cancer and 49.8% of them received the information from the media. While 45.8% of the participants knew that cervical cancer is cancer of the cervix, 72.7% believed that it only affects women, and 91.9% of the participants believed that cervical cancer is fatal[16]. Although many Nigerians may have heard of the disease through social media, school, workplace, friends, family members, and medical personnel;[6] there are still misconceptions, lack of understanding, and low interest in screening for it and surprisingly, some do not even know what the screening is for[7]. According to a systematic review conducted by [17,] a lack of knowledge about cervical cancer and screening was identified as a major barrier. Although some participants had a high level of awareness, many still lacked adequate information about cervical cancer and screening methods which is a barrier to screening services[2,12,14]. Therefore, proper knowledge of cervical cancer and its screening is crucial to eradicating the disease in Nigeria. In this case, the WHO's goal of eradicating cervical cancer by 70% will be feasible[16].

Poor health services: The health care facility service plays a crucial role in Nigeria's fight against cervical cancer. However, several factors hinder progress, such as the challenge of accessing screening services, inadequate guidance on screening and recommendations, lack of screening

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facilities, unfriendly attitudes from healthcare providers, poor health services, and limited time for screening[7,12,17].

***Poor utilization of screening services**:* In Nigeria, similar to other developing countries in the world, there is a lack of awareness and utilization of screening services. Early screening plays a critical role in preventing and controlling cervical cancer. Regardless of the introduction of HPV vaccination, it is still costly and only accessible to a very privileged few individuals who are aware of its importance and can afford it. Besides, some individuals do not even know where to screen for cervical cancer.[7,18-20]. Even when HPV vaccination is extensive, screening will remain critical in detecting those who are infected and show no symptoms. A high uptake of screening means that more women with pre-cancerous stages of cervical cancer will be identified and treated. On the contrary, low uptake would result in more people presenting at advanced stages leading to more morbidity and mortality. Other studies conducted in Enugu, Owerri, Zaria, and Osogbo also reported poor uptake of cervical cancer screening, with uptakes of 4.2%, 7.1%, 15.4%, and 22.0%, respectively[10]. The tussle in accessing screening centers likewise contributes to the non-utilization of screening services[20,21]. Although health workers in Nigeria have an opportunistic screening attitude, most reproductive health experts do not widely practice it and studies have revealed that despite the knowledge of the disease and the importance of screening among female health workers, the utilization of screening services is still low[20].

Perception that the screening is unnecessary: Studies have shown that some people perceived cervical cancer screening as irrelevant because of the lack of symptoms, disinterest, and belief that the disease is incurable[12]. People tend to neglect preventive services for cervical cancer until they begin to experience health issues. As a result, cervical screening is often seen as unnecessary[20].

Fear of the screening outcome and procedure: A cervical screening test may be either positive or negative, if negative it gives an impression of loss of life, also the procedure which involves opening the vagina to gain access to the cervix, using a speculum to expose the cervix may cause pain, and discomfort[5-7,18].

The screening cost: The cost of screening for cervical cancer is a major hindrance in preventing many women from being paid for screening. Accessible screening services are not offered for free and often, people have to prioritize their financial and social responsibilities due to economic constraints since screening services are unaffordable and expensive[12].

People's religion: According to PULSE Nigeria, Nigeria is referred to as one of the most religious countries in Nigeria, before a woman makes a decision, she would most likely refer back to her religion to see if her religion would consent to her decision, a study carried out in reported that Christian women showed a preference for female healthcare providers. Nonetheless, they were willing to be screened by male providers as long as a female chaperone was present while on the other hand, Muslim women highlighted several barriers to cervical cancer screening, including the need for their husband's permission, concerns about modesty, lack of awareness, cultural discrimination, and discomfort[21,22]. In the study, all the women acknowledged cultural norms of modesty could be a barrier to a decent cervical cancer screening. Interestingly, the Muslim FGDs were more emphatic about this barrier.

People's misconceptions: The misconceptions surrounding cervical cancer screening could produce confusion and conflicting opinions about the screening. Some women believed that cervical cancer screening is only indispensable for promiscuous women and those with sexually transmitted infections (STIs) while some understood that they could not develop cervical cancer. Moreover, the screening could expose women to STIs and other infections[12].

Stigmatization and confidentiality: Many Nigerian women also avoid cervical screening services due to the fear of being stigmatized and discriminated against by the disease. The negative attitudes of people toward the sexually transmitted nature of HPV, make them reluctant to get screened. This condition is often the stigma and discrimination associated with cervical cancer create a significant barrier to screening uptake[5,6,12].

Strategies for Improving Cervical Screening in Nigeria: To improve participation in cervical screening among women, measures must be put in place to allow rural communities to gain access to adequate information on cervical cancer[23]. The urbanized communities must also be fitted out with sufficient information on cervical cancer which would be achieved through rural outreaches, news televisions, newspapers, and other social media

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platforms including Facebook, Instagram, and Twitter.

Furthermore, access to a good health facility for screening and their proximity to the people is essential. Health personnel must recommend that the women undergo cervical screening at a minimum once a year. Mass mobilization should not merely target families but also faith-based institutions, religious organizations, and traditional and community leaders. Besides, non-governmental organizations (NGOs) should collaborate with health institutions to promote the availability, affordability, and utilization of the various preventive and treatment services for cervical cancer[23-25].

Moreover, it is promising to incorporate the use of molecular methods such as polymerase chain reaction (PCR) technique in cervical cancer screening would help solve the problem of invasive screening. Even though PCR techniques are known to be costly, they are essential in detecting the specific strain of HPV[24,25]. Besides, the Federal government and other health organizations including the WHO could help make the PCR technique more affordable by subsidizing cost[23].

In addition to the strategies for improving cervical cancer screening, the national health policymakers must deliberately implement cervical cancer screening[24] during ante-natal screening along with another disease of public health concern and should be taught in student's curricula. We advocate that the Government of Nigeria should implement subsidized or even free cervical screening programs in primary healthcare facilities, and decentralized mobile health centers, including secondary and tertiary health facilities through the Local Government health councils and the Ministry of Health.

Conclusion

This review paper provides an overview of the many reasons why countless women in Nigeria do not get screened for cervical cancer. Lack of awareness, unfavorable perception, problems with health system structure and process, and cultural conditions were major barriers for cervical cancer screening in Nigeria. Hence, packages of intervention is necessary create awareness, provide essential equipment, increase access to health facilities, and strengthening follow up system is indispensable for service improvement by the government and non-governmental organizations, world health organization inclusive.

Acknowledgment: The authors acknowledge Bingham University Library, Nigeria, for accessing free data services.

Conflict of Interest: Nothing to declare.

Funding statement: None.

Ethical approval: Not applicable.

Authors' Contribution: All authors were equally involved in literature search, review, analysis, manuscript preparation, revision and finalization.

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References

1. Buskwofie A, David-West G, Clare CA. A Review of Cervical Cancer: Incidence and Disparities. J Natl Med Assoc. 2020;112(2):229-32.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021;71(3):209-49.
3. Lawson O, Ameyan L, Tukur Z, Dunu S, Kerry M, Okuyemi OO, et al. Cervical cancer screening outcomes in public health facilities in three states in Nigeria. BMC Public Health. 2023;23(1):1688.
4. Simms KT, Steinberg J, Caruana M, Smith MA, Lew JB, Soerjomataram I, et al. Impact of scaled up human papillomavirus vaccination and cervical screening and the potential for global elimination of cervical cancer in 181 countries, 2020-99: a modelling study. Lancet Oncol. 2019 Mar;20(3):394-407.

5. Nwose EU, Okwe UN, Chime H. The odds that working women will accept cervical cancer screening and HPV vaccination. Int J Res Med Sci. 2019;7(5):1781.
6. Ayeni AR, Okesanya OJ, Olaleke NO, Ologun CO, Amisu OB, Lucero-Prisno III DO, et al. Knowledge of cervical cancer, risk factors, and barriers to screening among reproductive women in Nigeria. J Glob Health Sci. 2023;5(1):e2.
7. Ubah C, Nwaneri AC, Anarado AN, Iheanacho PN, Odikpo LC. Perceived Barriers to Cervical Cancer Screening Uptake among Women of an Urban Community in South-Eastern Nigeria. Asian Pac J Cancer Prev. 2022;23(6):1959-65.
8. Dodo AM, Sykes P, Powell C. Exploring the Barriers to Breast and Cervical Cancer Screening in Nigeria: A Narrative Review. Afr J Reprod Health. 2016;20(4):89-98.
9. Enechukwu OH, Gusen MJ, Usman MI, Shamshudeen A, Abdulaziz A. Factors influencing the uptake of cervical cancer screening among women of reproductive age in Nigeria: A systematic review. J Public Health (Berl). 2023; doi.org/10.1007/s10389-023-02098-7.
10. Pimple SA, Mishra GA. Global strategies for cervical cancer prevention and screening. Minerva Ginecol. 2019;71(4):313-20.
11. Martyn F, McAuliffe FM, Wingfield M. The role of the cervix in fertility: Is it time for a reappraisal? Hum Reprod. 2014;29(10):2092-8.
12. Mafiana JJ, Dhital S, Halabia M, Wang X. Barriers to the uptake of cervical cancer screening among women in Nigeria: a systematic review. Afr Health Sci. 2022;22(2):295-309.
13. Lei J, Ploner A, Elfström KM, Wang J, Roth A, Fang F, et al. HPV Vaccination and the Risk of Invasive Cervical Cancer. N Engl J Med. 2020;383(14):1340-8.
14. Oyouni AAA. Human papillomavirus in cancer: Infection, disease transmission, and progress in vaccines. J Infect Public Health. 2023;16(4):626-31.
15. Kamal M. Pap Smear Collection and Preparation: Key Points. Cytojournal. 2022;19:24.
16. Okolie EA, Barker D, Nnyanzi LA, Anjorin S, Aluga D, Nwadike BI. Factors influencing cervical cancer screening practice among female health workers in Nigeria: A systematic review. Cancer Rep. 2022;5(5):e1514.
17. Dozie UW, Ebirim CIC, Dike CR, Dozie INS, Ibe SNO, Abanobi OC. Determinants of cervical cancer screening uptake among female undergraduates in a tertiary institution in southeastern Nigeria: A cross-sectional study. J Prev Med Hyg. 2021; 62(1): E213-21.
18. Mbachu C, Dim C, Ezeoke U. Effects of peer health education on perception and practice of screening for cervical cancer among urban residential women in south-east Nigeria: a before and after study. BMC Womens Health. 2017;17(1):41.
19. Amu EO, Olatona FA, Ndugba SC. Cervical Cancer Screening Uptake and Barriers to Screening among Females in Somolu, South Western Nigeria. J Community Med Health Care. 2017;2(3):1017.
20. Abiodun OA, Fatungase OK, Olu-Abiodun OO, Idowu-Ajiboye BA, Awosile JO. An assessment of women's awareness and knowledge about cervical cancer and screening and the barriers to cervical screening in Ogun State, Nigeria. IOSR J Dent Med Sci. 2013;10(3):52-58.
21. Utoo BT, Ngwan SD, Anzaku AS. Utilization of screening services for cancer of the cervix in Makurdi, Nigeria. J Reprod Biol Health. 2013;1(1):1.
22. Isa Modibbo F, Dareng E, Bamisaye P, Jedy-Agba E, Adewole A, Oyeneyin L, et al. Qualitative study of barriers to cervical cancer screening among Nigerian women. BMJ Open. 2016;6(1):e008533.
23. Jawed S. Cancer of cervix. Retrieved from: https://www.slideshare.net/SameenJawed/cancer-of-cervix (Accessed November 5, 2023).
24. Atlas of visual inspection of the cervix with acetic acid for screening, triage, and assessment for treatment. Retrieved from: https://screening.iarc.fr/atlasviadetail.php?Index=10&e= (Accessed November 5, 2023).
25. Cervical Cancer Study Guide. Let's Talk Medicine. Retrieved from: https://www.letstalkmed.com/cervical-cancer (Accessed November 4, 2023).

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