

Analysis of the determinants of low cervical cancer screening uptake among Nigerian women

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Abstract

Cervical cancer causes an estimated 266,000 deaths globally, 85% of which occurs in developing countries. It is a preventable disease, if detected and treated early via *screen and treat*, yet its burden is still huge in Nigeria. In 2012, 21.8% cases and 20.3% deaths due to cervical cancer were recorded in Nigeria. This review, therefore, aims at understanding the determinants of low cervical cancer screening in Nigeria in order to contribute in reducing the burden of the disease. Literature were obtained from Global Health, Popline and PubMed databases; WHO and other relevant websites using Eldis search engine; and from libraries in the University of Leeds and WHO in Geneva. Conceptual framework for analyzing the determinants of cervical cancer screening uptake among Nigerian women was formed by inserting service delivery component of the WHO health system framework into a modified Health Belief Model. Wrong perception of cervical cancer and cervical cancer screening due to low level of knowledge about the disease and inadequate cervical cancer preventive were identified as the major determinants of low cervical cancer screening uptake in Nigeria. Among women, belief in being at risk and/or severity of cervical cancer was low just as belief on benefits of cervical cancer screening, unlike high belief in barriers to screening. Support from the community and screening skills among health-workers were inadequate. Improving uptake of cervical cancer screening will reduce the burden of the disease. Therefore, researchers and other stakeholders interested in prevention of cervical cancer should carry-out studies to identify interventions that could address the key determinants of low cervical cancer screening among Nigerian women.

Introduction

Cervical cancer is the abnormal change and proliferation of cells of the cervix.^{1,2} An effective technique for detecting the disease before its symptoms occur is cervical cancer screening.³ In Nigeria, there is no organized or national programme on cervical cancer prevention as obtained in developed countries, rather an opportunistic cervical cancer screening in which a woman is screened during a hospital visit for other reasons. This has led to low screening uptake and high incidence of cervical cancer.⁴ About 99.7% cervical cancer is caused by Human Papilloma Virus (HPV), transmitted sexually and harbored by 23.7% of women globally.^{5,6}

HPV causes gradual changes called cervical intraepithelial neoplasia (CIN) in the cervical cells. CIN occurs in three stages- CIN1, CIN2 and CIN3 (carcinoma-*in-situ*) before progressing to cervical cancer.⁷ The gradual development of the disease provides an opportunity for early detection via cervical cancer screening and treatment in order to forestall cervical cancer.⁸

Exposure to HPV, early age at sexual contact or marriage (<20 years), multiple sex partners, multiparty, co-infection (HIV, *Chlamydia*), low screening uptake, use of oral contraceptive and immunosuppressant are risk factors of cervical cancer among women.⁹ Other cervical cancer risk factors include; dietary deficiencies, smoking, and alcoholism.⁹ Cervical cancer prevention could be primary, secondary or tertiary.¹⁰ Primary prevention involves HPV vaccination to protect pubescent girls from HPV infection, use of barrier contraception and reduction in sexual partner to limit exposure to prostaglandin in semen found to favor cervical carcinogenesis as well as STI transmission that predisposes HPV infection.^{11,12} Secondary prevention of cervical cancer uses *screen and treat* to detect and remove CIN3 to avoid cervical cancer development.¹⁰ Cytology (Pap smear), visual inspection with acetic acid (VIA) or Lugol's iodine (VILI), colposcopy or HPV-DNA test are commonly used cervical cancer screening techniques.¹³ While cytology and VILI or VIA identifies CIN3,² HPV-DNA testing detects HPV DNA in cervical cells.¹⁰ Removal of CIN3 where present is through the use of cryotherapy, Electrosurgical Excision Procedure (LEEP) or Large Loop Excision of Transformation Zone (LLETZ).¹⁴ According to World Health Organization (WHO), VILI or VIA is more specific and involves a single-visit unlike cytology which, though, is more sensitivity requires three-visit by susceptible women.¹⁴ In Nigeria, cytology is still the most popular cervical cancer screening technique, gradually being replaced by VILI/VIA.^{3,15}

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Recommended screening interval varies between countries and screening techniques. For instance, HIV negative women (35-45 years) are screened using HPV-DNA test every 7 years in Rwanda.¹⁶ Information on recommended screening interval in Nigeria could not be accessed, but participants in studied reported Pap smear uptake after every three years.^{17,18}

Tertiary prevention reduces the impact of cervical cancer and involves surgery, radiotherapy and/or chemotherapy.¹⁰

Burden of cervical cancer

Globally, cervical cancer is the fourth most common cancer in women and the seventh in both sexes, with an estimated 528,000 new cases, and 266,000 deaths (projected to 500,000 deaths by 2030). It accounts for 12% of all female cancer deaths, 85% occurring in developing countries.¹⁹

In sub-Saharan Africa, cervical cancer accounts for 20-25% of all women cancers,

Western Africa having fifth highest burden with age standardized incidence rate (ASIR) of 29 per 100,000 women and age standardized mortality rates (ASMR) of 19.6 per 100,000 women in regional ranking in 2012 (all ages).^{19,20}

In Nigeria, cervical cancer ranks second after breast-cancer among women cancers, accounting for 21.8% new cases and 20.3% deaths in 2012.¹⁹

Impact of cervical cancer

Cervical cancer has impacts on gender equity and maternal health since only women are affected- Millennium Development Goals (MDGs) 3 and 5. The disease has indirect impacts on poverty/hunger, education and child mortality (MDGs 1, 2 and 3) which are at best with women, thereby weakening the family and community fabric.²⁰ In Nigeria, cervical cancer results in about \$3.3 million/DALYS lost annually,²¹ patient's caretaker may lose work opportunities or man-hour, medical costs are incurred, while invasive cases place burden on healthcare system.²²

Cervical cancer screening uptake in Nigeria

Cervical cancer screening uptake measures the number of eligible women to be screened within a population that actually got screened.²³ Though a single visit cervical cancer screening could save more than 6000 Nigerian women annually, uptake is low.¹⁷ *I'll rather recharge my phone than test for cervical and breast cancer* was credited to a Nigerian woman during a breast and cervical cancer screening subsidized from 2500 (\$15.40) to

1000.00 (\$6.15).²⁴ Out of thirteen different studies in Nigeria, nine showed cervical cancer screening uptake 5.3%, while four recorded uptake >5.3% (Table 1)²⁵⁻³³ against 75% in developed countries.²⁰

Table 1 showed that there is low cervical cancer screening uptake among Nigerian women. Therefore, this study aims to understand the determinants of low cervical cancer screening and interventions for improving uptake among Nigerian women in order to contribute in reducing cervical cancer incidence in Nigeria.

Methodology

Conceptual framework

Conceptual framework was used to analyze the determinants of low cervical cancer screening uptake among Nigerian women. Service delivery component of WHO Health System Framework was inserted into modified version of Health Belief Model (HBM) to form the study conceptual framework in Figure 1, since health is promoted based on theories and models.^{31,32,34} The conceptual framework consists of *modified HBM* (Perceptions about cervical cancer and cervical cancer screening, Cues to action), *Modifying factors* (knowledge etc.) and *Health system components* (cervical cancer prevention service delivery). Modified HBM has six constructs namely; perceived susceptibility, perceived severity, perceived benefits, perceived barriers; self-efficacy; and cues to action influenced by modifying factors.^{31,32}

Modifying factors

Knowledge, age, culture, educational level, marital status, parity, social support and social status affect perceptions about cervical cancer susceptibility and severity, and cervical cancer screening benefits and barriers.³¹

Perceived susceptibility

Perceived susceptibility to cervical cancer is the belief about being at risk of cervical cancer. A woman may not be interested in cervical cancer screening unless considers herself susceptible to the disease.³¹

Perceived severity

Perceived severity of cervical cancer is a woman's feelings about the medical harm (death, disability, pain) or social damage (effects on work, family and social life) for developing cervical cancer or not utilizing cervical cancer screening/treatment.³³

Perceived benefits

Perceived benefits of cervical cancer screening are the belief in positive attributes of screening.³⁵ Cervical cancer susceptibility and severity may be perceived, but the likelihood of screening uptake is influenced by the perceived benefits.³⁴

Perceived barriers

Perceived barriers are negative aspects of cervical cancer screening, non-conscious cost-effective analysis by a woman, involving measuring the expected benefits of screening (*it could help me*) against perceived barriers (*but it may be painful, embracing, expensive, and time consuming*), which influence screening uptake.³³

Cues to action

Mass media campaign, advice from people, reminder from doctors, illness of a relation or friend which appeals to the brain's interpretation of perceived susceptibility, severity, benefits and stimulates readiness for cervical cancer screening uptake are cues.³²

Perceived self-efficacy

Perceived self-efficacy is the belief or confidence that makes women go for cervical cancer screening to prevent the disease.³²

Table 1. Cervical cancer screening rate in Nigeria.

	Study population	Study area in Nigeria	Screening rate (%)
1	Women who attended antenatal clinics ²⁶	Ibadan (West)	0
2	Igbo women in a rural population ¹⁸	South-East	0.6
3	Female medical practitioners ²⁷	Enugu, South-East	1.8±1.2
4	Women who attended the gynaecological out-patient clinic ⁴	Sokoto (North)	1.29
5	Rural women ²⁸	Osun (West)	2.4
6	Rural women ²⁹	Ibadan (West)	3.9
7	Rural and urban women ²³	Nigeria	4.2
8	Women in urban neighborhood ¹⁵	Lagos (West)	5.1
9	Female undergraduate students ³⁰	Nigerian university	5.2
10	Women in Owerri ³¹	South-East	7.1
11	Igbo women ³²	Abakiliki (South-East)	10.1
12	Federal civil servants ²⁵	Jos (North)	10.2
13	Female nurses ³³	University College Hospital, Ibadan (West)	32.6

Cervical cancer prevention service delivery

Cervical cancer prevention service delivery includes screening, counseling, diagnosis, treatment and follow-up of clients by health-workers putting into perspective accessibility, availability, affordability, acceptability and quality which influence the likelihood of cervical cancer screening uptake.³³

Data sources

Global health, Pop line and PubMed databases were used to access a wide coverage of literature. Generic publications were accessed through manual search of WHO, IARC and ACCP websites, while additional literature were obtained from Eldis search engine through snowballing of the reference section

of some articles selected from databases and websites for other relevant publications. Information from relevant text-books and publications were retrieved from libraries in the University of Leeds and WHO in Geneva.

Keywords/search strategy

Keywords for the study were combined and articles searched as shown in Table 2 and Figure 2.

Selected articles from Global Health were saved in an auto-alert format for access to new publications. To enable selection, there was topical breakdown of results obtained from databases into- determinants of low cervical cancer screening and interventions for improving cervical cancer screening uptake. There were minor modifications of the key-

words for retrieval of information from web-sites, because certain words like feasibility, accessibility, acceptability, quality and effectiveness were required to generate further information.

Inclusion and exclusion criteria

The titles and abstracts were used to select full text publications addressing the determinants of low cervical cancer screening uptake and/or interventions for improving uptake. Peer-reviewed publications were given priority. Only literature published in English and after 1990 were reviewed because of language barrier and increased research in cervical cancer starting from the 90's. Publications not meeting the above criteria; giving technical/medical details of cervical cancer

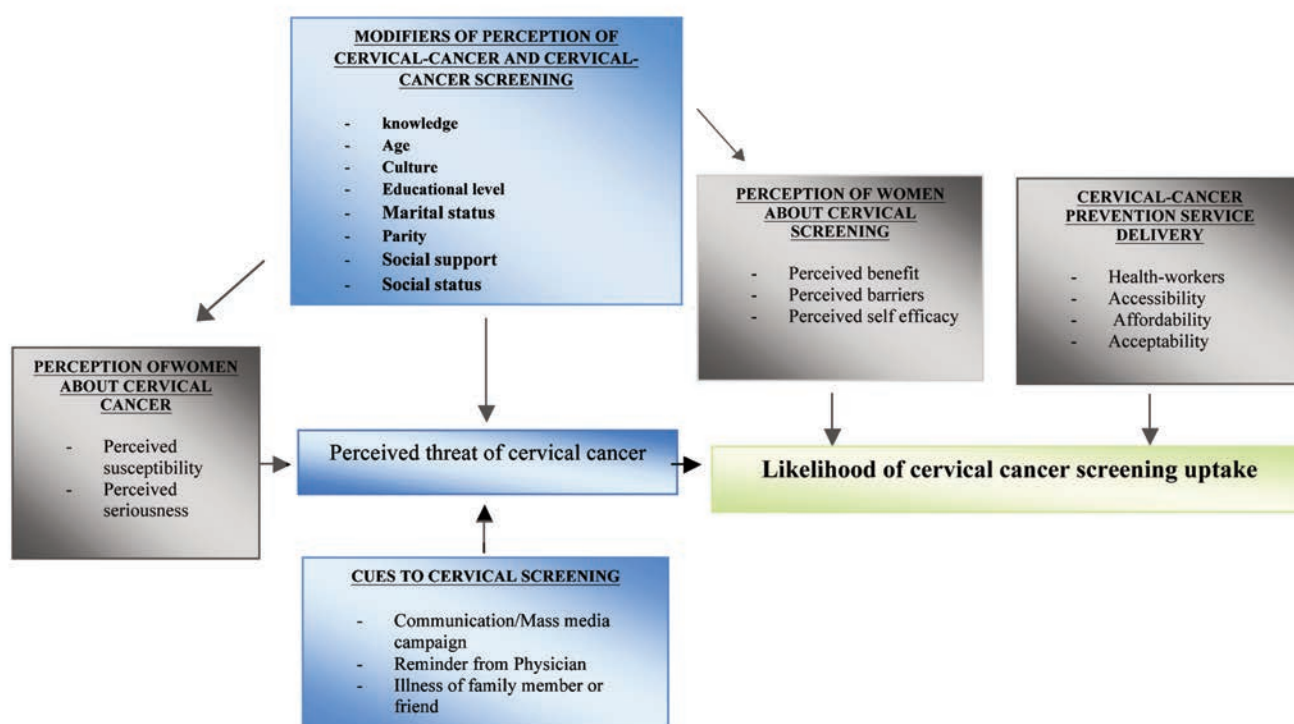


Figure 1. Conceptual framework for improving cervical cancer screening uptake among Nigerian women.^{31,32}

Table 2. Literature search strategy.

	Keywords	Databases		
		Global health	Popline	PubMed
1	Determin* OR predictors*	411,014	53,686	2,682,952
2	Cervica Cervical cancer* OR Human papilloma virus* cancer* OR Human papilloma virus*	10,509	156	32,645
3	Screen* OR early detection* OR pap smear* OR visual inspection* OR prevention*	230,422	98,522	1,752,370
4	Wom* OR female*	307,335	161,674	6,772,079
5	Developing countr* OR Nigeria* OR Africa*	566,080	309,840	344,319
6	I, ii, iii, iv, v [AND]	419	34	254
7	Referenced	12	5	14

interventions, based on experimental laboratory or animal studies or in context not similar to Nigeria were excluded.

Selected literature

Endnote was used to sort database literature (Table 2) and thirty-one referenced. Fourteen articles were referenced from websites, snowballing of references and textbooks. Two publications obtained from autoalert were not used

because information they contained were not different from seventy-four referenced (Figure 2).

Study limitations

The policy on National cervical cancer prevention in Nigeria was either non-existent or not accessible for retrieval of information on government plan about the disease. However, robust evidence showed that there is need to improve cervical cancer prevention services.

Again, the full texts of some publications were inaccessible and could not be used. The study focused on; cervical cancer perception, influence of knowledge on perception and accessibility of women to screening/treatment rather than the entire modifying factors and health system which are important in improving cervical cancer screening/treatment uptake.

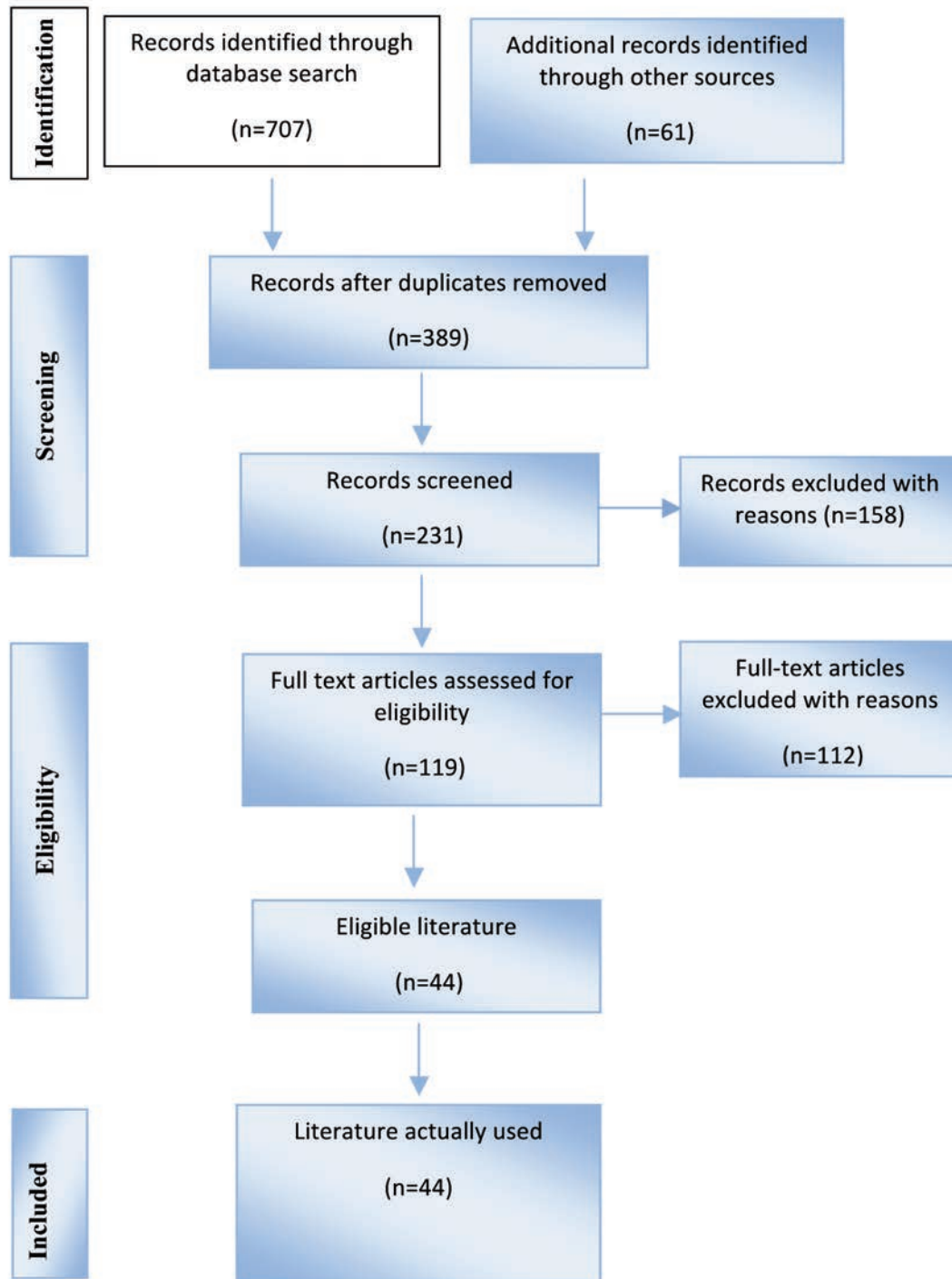


Figure 2. Literature selection prisma flow diagram.

Analysis of determinants of low cervical cancer screening uptake in Nigeria

Brief information about Nigeria

Nigeria is located in Western Africa, has about 250 ethnic groups, 6 geopolitical zones and 36 states with Abuja - the capital.³⁶ It has a population of 140,431,790 (2006 census); 70,215,895 females, 60-70% residing in rural areas and 36.6 million aged 20-65 years at risk of cervical cancer.^{33,37} About 48.4% of the Nigerians live on below \$1 daily, with women literacy and employment level of 54% and 59% respectively.³⁸ The median age at first sexual intercourse is 17.7 years, while average years at marriage are 22.0 and 15.5 years for educated and uneducated women respectively.³⁸ There is short birth intervals of <24 months, 6% use pill, 1% use tobacco and 2% health insurance coverage for women of reproductive age.³⁶ One-in-ten women read a newspaper weekly, two-fifths watch television at least once a week and 50% households own mobile telephone.³⁶ The above information is important in understanding cervical cancer situation in Nigeria and differ across geopolitical zones, urban-rural divide, socioeconomic class and age group.

Determinants of low cervical cancer screening uptake in Nigeria

Determinants of low cervical cancer screening uptake include; perceptions about cervical cancer, perception about cervical cancer screening, modifying factors, cues to cervical cancer screening uptake and self-efficacy (demand-side determinants) and cervical cancer prevention service delivery (supply-side determinant).

Perception about cervical cancer among Nigerian women

Cervical cancer screening uptake among women is higher if the risk of cervical cancer is perceived.³³ Belief in not being at risk was identified as a factor that influenced cervical cancer screening uptake in eight Focus Group Discussions involving 82 participants that never screened conducted in Nigeria,²⁵ explaining why 2.4% screening rate was reported among respondents who believed that not being aware of cervical cancer will prevent them having it.¹² Perception about cervical cancer susceptibility (50.9%) and screening rate (10.2%) among civil servants in Jos-Nigeria showed that increased perception of susceptibility increases screening uptake,¹⁷ agreeing with the findings of above.^{25,30}

Women who perceived cervical cancer as serious with medical, social and economical consequences were ten times more likely to

undergo cervical screening than those that do not.⁵ However, it was argued that perceived cervical cancer susceptibility may not be enough to change behaviour towards cervical cancer screening uptake.³⁵ In a qualitative study carried out in Kenya, a country with context similar to Nigeria, low screening uptake was observed despite perception of the severity of cervical cancer.³³ Supporting the argument, 90.1% of respondents in a study in Nigeria perceived that cervical cancer can kill, yet screening rate was 32.6%.³⁰ Though screening rate (32.9%) seemed to have improved with perceived severity, it is not proportional to 90.1% perception of severity reported.

Perception of benefits and barriers about cervical cancer screening among women

If a woman perceives personal susceptibility/severity, cervical cancer screening uptake depends on her belief regarding its benefit.³³ Women who believed that cervical cancer is not treatable, but preventable via screening were more likely to uptake screening.³⁴ Belief that cervical cancer is not preventable was responsible for 10.2% screening rate among 38.6% participants aware of cervical cancer screening.¹⁷ Women who never heard about cervical cancer screening became interested in screening on perceiving its benefits.²⁵ It was also reported that women who believed that screening could improve survival were ten times more likely to take up cervical cancer screening than those that do not.⁵ However, a contrary report had it that perceived benefits was not a significant determinant of cervical cancer screening uptake, observing no significant difference in the likelihood of cervical cancer screening uptake among those who perceived the benefits and those who do not.³⁵

Lack of knowledge about cervical cancer and where screening services are offered, domestic responsibilities, nonchalant attitude to one's health especially when there is no obvious symptoms of sickness, fear (of pain, unpleasant side effects and positive result), financial constraint, three clinic visits for cytology which increases cost, partner's attitude and lack of support for screening (due to withdrawal of sex within the period), suspicion of infidelity or promiscuity, unfriendly and rude attitude of health-workers to women were identified to impede cervical cancer screening uptake in Nigeria and also in Kenya.^{25,32,39} Other perceived barriers to cervical cancer screening uptake include; embarrassment, violation of genitalia, difficulty in accessing health facility, waiting time in screening facilities, lack of medical advice from health-workers.^{5,20,39} In Nigeria, while about 98% of women have no health insurance coverage, cervical cancer prevention is not covered for

those who have.³⁹ Considering the high poverty index (48.4%) in Nigeria,³⁸ payment of about 2,500 (\$15.40) out-of-pocket is a barrier.²⁴

Cues to action

Increased cervical cancer screening uptake was observed among women attending antenatal clinic following their contact with nurses who cued them to screening through education.¹⁷ Similarly, the likelihood of cervical-cervical screening was reported among women who had contact with survivors of cervical cancer, mass media, had reminder from health-workers or encouraged by family members to go for screening.^{17,33,40}

Perceived self-efficacy

Independent studies carried out in Nigeria revealed that confidence in one's ability to uptake cervical cancer screening was responsible for 76% and 81% of women ever screened reporting screening ones every 3 years.^{17,18} Similar result was obtained in studies in Kenya and Botswana with most of the women who were aware of cervical cancer and had a previous history of screening interested in regular screening, unlike those with little or no knowledge and had never been screened.¹² On how self-efficacy for screening uptake developed, women attributed their confidence to education received from nurses.¹⁷ A contrary observation was recorded in Tanzania where the ever screened women declined to subsequent cervical screening due to pain and inconveniences associated with the procedure, emphasizing quality of service.⁵

Modifiers of women's perception about cervical cancer and cervical cancer screening in Nigeria

Perception could be influenced by knowledge, age, culture, stigmatization, ethnicity, religion, marital status, parity, education, social support and social status of a woman.^{12,17,30} However, only knowledge was discussed since much about cervical cancer perception which determines screening uptake depends on cervical cancer and cervical cancer screening knowledge among women than other modifying factors.³³

Knowledge

Inadequate knowledge about cervical cancer was responsible for no uptake of cervical cancer screening among Nigerian women in a qualitative study in which none out of 82 of the participants ever screened.²⁵ In a similar study

to investigate awareness and perception of cervical cancer and cervical cancer screening among civil servants in Jos-Nigeria, cervical cancer and Pap smear test awareness was 50.9% and 38.6% respectively with a screening rate of 10.2% which is higher than 0.6% among Igbo women in a rural population without such knowledge.^{17,18} Similar reports indicated that increase in knowledge of cervical cancer and cervical cancer screening increased the likelihood of uptake of cervical cancer screening in Tanzania, recording nine-fold and three-fold increase in utilization of screening service among women who had knowledge about cervical cancer and cervical cancer screening than their counterpart without such knowledge.^{5,20} However, women may have knowledge and correct perception about cervical cancer and cervical-screening without taking up screening due to factors like accessibility, acceptability, affordability and quality of screening and treatment services, emphasizing that knowledge does not always translate into behaviour change.^{35,39} Anecdotal evidence agreed that increasing knowledge has been effective in improving uptake of services, especially if the intervention is participatory, equitable and takes into consideration the local context.

Cervical cancer prevention service delivery

Service delivery, workforce, leadership/governance, finance, information and medical products/vaccines/technology were identified as supply-side determinants of low cervical cancer screening uptake in Nigeria.^{18,25,31,39,41} However, focus will be cervical cancer prevention service delivery in terms of accessibility, acceptability, affordability and quality in Nigeria, since they were identified as the key determinants of low cervical-screening uptake.^{18,25,41}

Accessibility and affordability of screening and treatment services

Availability of cervical cancer prevention services in secondary and tertiary health facilities makes it inaccessible to women in rural areas who spend additional money and time on transport to get to the facilities, making service expensive and unaffordable.²⁵ Non-availability of screening centers locally, in primary health centres, affected screening uptake among Igbo women in rural population of Southern-Eastern Nigeria.¹⁸ Women residing within 2 to 5 km to cervical screening facilities were four times more likely to have screened than those that live further away.²⁰ Similarly, location (rural or urban) was associated with uptake of cervical screening, as women in urban area were more likely to screen than women in rural areas.⁴² A reversed pattern of

screening uptake was observed in Botswana where women in rural areas (51.7%) screened more than those in peri-urban (30.3%) and urban (18.0%) areas, suggesting that this could be explained by doctors' recommendation of cervical cancer screening when rural women consult for other diseases of the reproductive organ which were believed to be more among rural than urban dwellers.³⁵

Acceptability of cervical cancer screening

Cervical cancer screening is acceptable in Nigeria especially when a female health-worker provides screening services.^{4,17} In a qualitative study exploring reasons for the low uptake of cervical cancer screening, participants reported embarrassment and shy when male health-worker collect Pap smear for cervical cancer screening.⁴ Long waiting time, overcrowding in facilities and time taken before test results are released were discouraging and unacceptable to women.³³ Exploring why women employed were likely to have lower screening rate than unemployed, it was noted that some employed women found it difficult to attend appointments during working hours, especially when they have to travel long distances, while women in rural areas leave for the fields/farm or market early in the morning, sometimes spending several days amidst unreliable transportation system and bad road.^{15,26} In Kenya, some women who came to hospital late due to long distance and bad road were sometimes turned away without being screened.⁴³ The scenario is similar to what happens in public health facilities in which the likelihood of not being attended to on arrival to the facility after noon is high, except on emergency: an experience which is unacceptable to clients.

Quality of cervical screening

A study carried out in eight developing countries with low screening rate and inadequate resources like Nigeria identified poor-quality services pains due to lack of screening skill by health-workers, delay in release of result, lack of counseling or adequate communication before and after the test, screening equipment sterility issues, lack of privacy and comfortable changing facilities or specimen collection room were some of the causes of low cervical cancer screening uptake which dissatisfy women, and dissatisfied women discourage others from participating in screening. Decline in subsequent cervical cancer screening after the initial screening by ever screened women was attributed to poor quality of service.^{5,43}

Health-workers and cervical cancer prevention services

Participants in a study exploring the rea-

sons for the low uptake of cervical cancer screening in Nigeria credited their awareness of cervical cancer and cervical cancer screening to health-workers, while others complained never to have been informed about the disease in health facilities.²⁵ Women complained of shortage of health-workers and their rude behaviour to clients especially in public health facilities, reporting little or lack of physical examination (blood pressure check) before prescription, non-verbal behaviour to discourage questions from patient, lack of screening skill and unnecessary harm to patient as influencing cervical cancer screening uptake in Nigeria and other countries with similar context.⁴²⁻⁴⁴ Exit interviews conducted at 13 sites in 6 developing countries with 1058 women aged 25 to 49 years who participated in screening revealed that in addition to the aforementioned health-worker factors, inadequate communication skills and ineffective health-worker-client relationship could lower cervical cancer screening uptake.⁴³

Conclusions and recommendations

Cervical cancer burden and impact is huge in Nigeria due to low cervical cancer screening uptake predicated on: incorrect perception about the susceptibility and/or severity of the disease, incorrect perception about cervical cancer screening benefits and barriers, as well as low self-efficacy towards uptake of screening service. These determinants are influenced by low knowledge about the disease and inadequate cues for cervical cancer screening uptake by women. Limited cervical cancer prevention service in terms of accessibility, affordability and quality operating from the supply side also explained the low cervical cancer screening uptake among Nigerian women.

Research should be carried out by public health practitioners and stakeholders in Nigeria including Federal and State Ministries of Health, Education, Gender, and communication in Nigeria to identify context-specific interventions that if implemented will improve cervical cancer screening uptake and reduce new cases of cervical cancer in Nigeria.

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