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Exploring self-reported barriers to the uptake rate of cervical cancer screening among a cohort of screen-aware Nigerian women of reproductive age using an analytical framework

Authors: J. O. Awoleke[1,*]; T. Akinyemi[2]; T. O. Okunola[1]

Affiliation: *[1]Ekiti State University, Ado-Ekiti, Nigeria; [2]National Open University of Nigeria, Ado-Ekiti Study Centre, Nigeria.*

ABSTRACT

INTRODUCTION: Although cervical cancer is preventable, it remains a major public health burden in low- and middle-income countries (LMIC). Evidence abounds to show that its prevalence can be reduced by screening for premalignant cervical lesions. However, poor uptake of cervical cancer screening in LMIC has been linked to numerous barriers operational at the individual and health-system levels. The study adopted an analytical framework to explore the barriers to the uptake of cervical cancer screening reported by women who were aware of its benefits (screen-aware).
METHODS: Reproductive age women who were aware of cervical cancer screening were recruited from outpatient clinics in health facilities across the three tiers of service delivery using simple random sampling technique.
RESULTS: Most of the barriers to accessing cervical cancer screening from this study were related to acceptability of the procedure, and these were largely demand-side factors such as negative expectations, preferences, poor risk perception, low self-esteem and religious stigma. Availability-related barriers were the second commonest group, including supply-side determinants like non-availability of personnel for the screening, non-recommendation of the procedure by health workers, long waiting times at the clinics, and discouraging attitude of the healthcare providers. Less than one-tenth of the women reported access to the location of the screening facilities as a barrier to its utilization.
CONCLUSION: Employing the analytical framework made it easier to identify the dimensions of barriers to accessing cervical cancer screening, design strategies to mitigate these barriers, and evaluate the effectiveness of the various interventions.

Keywords: Uterine cervical neoplasm, early detection of cancer, health services accessibility, patient acceptance of health care, perception, Nigeria

INTRODUCTION

Cervical cancer is the fourth most prevalent cancer amongst women across the globe and the second commonest female malignancy in women living in sub-Saharan Africa [1–3]. In 2020, 604,127 cases of cancer of the cervix were diagnosed worldwide with 341,831 cancer-related deaths, giving a

***Corresponding author:** Professor Jacob Olumuyiwa AWOLEKE, Department of Obstetrics & Gynaecology, College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria. Email: jacob.awoleke@eksu.edu.ng Telephone: +234 806 328 9272; **Potential Conflicts of Interest (CoI):** All authors: no potential conflicts of interest disclosed; **Funding:** All authors: No funding was sought for this study; **Academic Integrity.** All authors confirm that they have made substantial academic contributions to this manuscript as defined by the ICMJE; **Ethics of human subject participation:** Ethics and Research Committee of the Ekiti State University Teaching Hospital, Ado – Ekiti (Approval No: EKSUTH/A67/2023/08/013), and the National Primary Health Care Development Agency, Ekiti State (Approval No: EK/PHCDA/ADM/316/220); **Originality:** All authors: this manuscript is original has not been published elsewhere; **Review:** This manuscript was peer-reviewed by three reviewers in a double-blind review process; **Type-editor:** Peter (USA).

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case-fatality ratio of 0.57, the burden being disproportionately heavier in low- and middle-income countries (LMIC) [1]. Figures from Nigeria reveal that more than 50 million women 15 years and above are at risk of developing cervical cancer, 14,943 new cases are diagnosed annually, and 10,403 cancer-related deaths occur yearly, thus, making this preventable disease a major public health concern in the nation [3,4]. Unfortunately, a significant proportion of these preventable deaths could have been avoided using the same strategies that had effectively reduced the prevalence and deaths from cervical cancer in developed nations over the last three decades – organized nation-wide screening for premalignant cervical lesions in women within the reproductive age group and high-coverage vaccination of young girls against human papilloma virus infection [5–7].

Screening rates for cervical cancer are still low in Nigeria and many other LMIC in spite of the increasing awareness, documented willingness and positive attitude towards screening among women across various strata of the society [8–10]. This poor uptake occurs even amongst health workers [11–14], and thus, most of the diagnosed cases of cervical cancer present in advanced stages with poor prognostic outcomes [15–17]. Studies have reported screening rates(uptake of cervical cancer screening) as low as 4.8% - 7% in eastern and central Uganda respectively [18,19], and a mere 11% amongst screen-eligible women in Nigeria [20]. These low statistics in many LMIC led to the launch of the global strategy 90-70-90 by the World Health Organization in 2020. It proposes that by 2030, countries are to achieve 90% HPV-vaccination coverage for young girls by age 15, 70% screening of eligible women by age 35 and 45, and treatment of 90% of women diagnosed with cervical lesions, aiming for 4 cervical cancer cases per 100,000 women-years as the elimination threshold [21]. This is expected to set nations on the path ofelimination of cervical cancer.

Various factors, individual/community-level and health system-related, have been documented to influence the uptake of cervical cancer screening particularly in low-resource settings [22–24]. Incidentally, it is yet to be determined if the influence of these factors/barriers significantly differ in women who were naïve about screening compared with those who had knowledge about screening and its benefits. The success of national screening programmes have been moderated by the efficiency of the health systems to organize, mobilize, educate, and freely engage women, and their spouses, coupled with a robust follow-up mechanism to track results, monitor and evaluate the impact of such programmes [25]. Also, community-level determinants such as awareness and knowledge, risk perception, acceptance, myths and misconceptions, religious inclination, and geographical location of the services can facilitate or limit the utilization of this public health intervention [14]. Although the roles of these factors have been documented in various studies, effective public health interventions and approaches to modify them are yet to produce satisfactory results in LMIC. Previous studies targeted at improving the uptake of cervical cancer screening in Nigeria consistently found an improvement in the awareness and knowledge of the participants but without a corresponding increase in practice [23,26–28].

Inspite of the cost-free cervical cancer screening services provided in a district in Cameroun, less than 50% of the eligible women participated in the programme [29]. The evidence confirms that just being aware of the screening is not sufficient to increase utilization because of the role of other influencers of health behaviour [2]. Thus, increasing awareness of cervical cancer screening does not translate to the timely utilization of the service according to the needs of the women [30]. Thepoor uptake may be due in part to the fact that the factors influencing the utilization of these preventive strategies have not been considered within the context of their social 'demand' by individuals/communities and 'supply' via the response of the health systems [31,32]. This model has enabled public health experts to properly characterize the determinants of poor utilization of health interventions and design strategies to address them[33,34].

Additionally, the framework can serve as a template against which current interventions can be evaluated to determine their effectiveness in addressing the barriers [34]. However, studies exploring the non-utilization of cervical cancer screening among women in LMIC who are aware of the screening are sparse. Thus, this study was designed to explore the barriers to the uptake of cervical cancer screening reported by women who were aware of its benefits, and to generate data to guide evidence-based interventions.

METHODS

Study Design and Setting

This descriptive institution-based cross-sectional study involved survey of a cohort of reproductive age women who were aware of cervical cancer screening. Ado – Ekiti, the study location, doubles as the largest and capital city of Ekiti State in southwestern Nigeria with a population density of 1,100/km2 and human population of 308,621 who are mainly Ekiti dialect-speaking people of Yoruba extraction [35]. The community has health facilities providing reproductive health services via women's clinics at the various tiers of health care delivery. The study settings were three (3) public health facilities – one each, providing primary, secondary and tertiary healthcare – chosen because of their strategic locations and client load. These are: (i) Comprehensive Health Centre, Okeyinmi, Ado – Ekiti, (ii) Oba Adejugbe General Hospital, Ado – Ekiti, and (iii) Ekiti State University Teaching Hospital, Adebayo, Ado – Ekiti. Their clients come from the capital, other communities in Ekiti State, and from the neighbouring Kogi, Osun, and Ondo states.

Sample Size Calculation and Sampling Technique

The sample size was calculated using the Cochran's formula: n = z2pq/d2, where n = number needed for the study, z = standard normal deviate = 1.96, p = prevalence of cervical cancer screening from a previous study, q = 1 – p, and d = 5% error margin [36]. Using the uptake of cervical cancer screening of 13.5% obtained from a previous study conducted at Ibadan, another city in southwest Nigeria [37], p = 0.135, and thus, n = 179. Considering a 10% attrition, the sample needed for the study = 198.

Simple random sampling was used to select women that attended the clinics in any of the health facilities, who were within the reproductive age group (15 – 49 years), were aware of cervical cancer screening, and consented to participate were included in the study. The participants were informed about the purpose of the survey and the confidentiality of their responses, and that they could opt-out of the study any time they felt the need to do so.

Data Collection Tool and Procedures

The instrument for the survey was a semi-structured self-administered and interviewer-assisted questionnaire recoded into the framework developed by Jacobs et al [34] to capture the determinants and access barriers to the uptake of cervical cancer screening among the respondents. Four dimensions/groups of barriers were identified according to O'Donnell [33]– accessibility (geographical), availability, affordability and acceptability – and these were sub-divided into demand- and supply-side factors with sub-themes based on the reported reasons identified from previously published literature (Table 1). Access to health services can be hindered via 'demand-side' or 'supply-side' factors. Factors that influence the ability of individuals, families, or communities to utilize healthcare services were classified as demand-side barriers, while determinants within the health system affecting the uptake of health services by communities, households, or individuals were regarded as supply-side factors. This distinction can guide the design of strategic and targeted public health interventions [33,38]. The questionnaire also included the socio-demographic details of the respondents (age, marital status, religion, employment status, level of education, ethnicity, and parity), their uptake of cervical cancer screening and the methods used. On completion of the questionnaires, the assistants ensured that they were completely filled.

Pilot-testing: Twenty questionnaires were randomly distributed to women in the study centres to pretest the survey instrument to ascertain comprehensibility and clarity of the content. These were not included in the final analysis.

Data Analysis

The data were imported into the Statistical Package for the Social Sciences (SPSS) version 25 (IBM, Chicago), and analyses done using descriptive statistics for the responses and chi-square test for inferences. The level of statistical significance was set at $p < 0.05$.

The survey was granted ethical approval by the Ethics and Research Committee of the Ekiti State University Teaching Hospital, Ado – Ekiti (EKSUTH/A67/2023/08/013), and the National Primary Health Care Development Agency, Ekiti State (EK/PHCDA/ADM/316/220).

RESULTS

The mean age of the respondents was 30.23

Table 1: Typology of access barriers to the uptake of health services [34]

Classification	Determinant	Access barriers
Access (geographical)	Supply-side	Service location
	Demand-side	Indirect costs
		Transport means
Availability	Supply-side	Health workers
		Waiting time
		Staff motivation
		Drugs & consumables
		Non-integration of health services
		Lack of opportunity
		Late referral
	Demand-side	Information on health care
		Education
Affordability	Supply-side	Cost and prices of services
		Private-public dual practice
	Demand-side	Household resources
		Opportunity costs
		Cash flow
Acceptability	Supply-side	Billing system
		Interpersonal skills
	Demand-side	Expectations
		Low self-esteem
		Preferences
		Stigma
		Health awareness

± 6.74 years. Forty-three (21.7%) respondents were adolescents and young adults. Most of the respondents were married 147 (74.2%), practiced Christianity 177 (89.4%), and were presently employed 155 (78.3%). More than four-fifths (84.1%) were educated to the tertiary level and were of Yoruba ethnicity (83.8%). Nearly one-quarter (24.2%) of the participants were nulliparous women (Table 2).

From Table 3, twenty-one women reported having had at least a method of cervical cancer screening, giving a screening rate of 14.1%. Two of the women (7.1%) who had been screened had both HPV DNA testing and the cytological examination using Papanicolaou smear.

Table 4 showed that of the socio-demographic features of the respondents, only religion was significantly associated with the uptake of screening, with the practice of Christianity being significantly associated with utilization of cervical cancer screening among the women studied ($\chi 2 = 8.441$; $p = 0.015$).

The most commonly reported barriers to accessing cervical cancer screening from this study 1158/2746 (42.2%) were related to acceptability of the procedure, and these were largely demand-side factors. Majority of the respondents refrained from the screening because of their negative expectations (44.6%) – of pain from undergoing a "surgical procedure," developing an infection or painful sexual experience, or unnecessary worry and anxiety – after the exercise. Also, women did not accept the screening because of their preferences (15.4% reported that they were unlikely to undergo a cervical cancer screening) and health awareness

Table 2: Socio-demographic characteristics of the respondents (n = 198)

Characteristics	Groups	Frequency	Percentage
Age (years)	15 – 24	43	21.7
	25 – 34	104	52.5
	35 – 44	47	23.7
	≥ 45	4	2.0
Age (Mean ± SD)	30.23 ± 6.74 (Range: 18 – 49 years)		
Marital status	Single	51	25.8
	Married	147	74.2
Religion	Christianity	177	89.4
	Islam	20	10.1
	Traditional	1	0.5
Occupation	Unemployed	43	21.7
	Employed	155	78.3
Level of education	No formal	3	1.5
	Primary	2	1.0
	Secondary	26	13.1
	Tertiary	167	84.3
Tribe	Yoruba	166	83.8
	Igbo	20	10.1
	Hausa	3	1.5
	Others	9	4.5
Parity	0	48	24.2
	1 – 2	101	51.0
	3 – 4	43	21.7
	5 or more	6	3.0

which was reflected in the perception of their risk of having cervical cancer (12.9% of the women did not agree that early detection of cervical lesion can significantly improve the prognosis of the disease, and that they will only go for screening when they have a non-resolving vaginal discharge). Other reasons for not accepting cervical cancer screening were loss of self-esteem when examined by male health workers (7.9%) and religious stigma (8.5%) of undressing before a man who is not your husband (Table 5).

Availability-related barriers constituted 1099/2746 (40%) of the responses. They were significantly supply-side determinants including non-availability of personnel for the screening, non-recommendation of the procedure by health

Table 3: Utilization of cervical cancer screening modalities (n = 198)

Category	Frequency	Percentage
Never been screened for cervical neoplasia	170	85.9
Had been screened for cervical neoplasia	28	14.1
Type of cervical cancer screening method utilized (n = 28)		
Pap smear	22	78.6
Human Papilloma Virus (HPV) DNA test	4	14.3
Pap smear + HPV DNA test	2	7.1

Table 4: Utilization of cervical cancer screening services versus Socio-demographic characteristics of the respondents (n = 198)

Characteristics	Categories	Had screening		χ2	p-value
		Yes (%)	No (%)		
Age (years)	15 – 24	5 (17.9)	38 (22.4)	1.814	0.612
	25 – 34	13 (46.4)	91 (53.5)		
	35 – 44	9 (32.1)	38 (22.4)		
	≥ 45	1 (3.6)	3 (1.8)		
Marital status	Single	6 (21.4)	45 (26.5)	0.320	0.572
	Married	22 (78.6)	125 (73.5)		
Religion	Christianity	22 (78.6)	155 (91.2)	8.441	0.015*
	Islam	5 (17.9)	15 (8.8)		
	Traditional	1 (3.6)	0 (0)		
Occupation	Unemployed	5 (17.9)	38 (22.4)	0.286	0.593
	Employed	23 (82.1)	132 (77.6)		
Education	No formal	0 (0)	3 (1.8)	1.063	0.786
	Primary	0 (0)	2 (1.2)		
	Secondary	3 (10.7)	25 (13.5)		
	Tertiary	25 (89.3)	142 (83.5)		
Tribe	Yoruba	25 (89.3)	141 (82.9)	6.634	0.085
	Igbo	0 (0)	20 (11.8)		
	Hausa	0 (0)	3 (1.8)		
	Others	3 (10.7)	6 (3.5)		
Parity	0	6 (21.4)	42 (24.7)	2.195	0.533
	1 – 2	12 (42.9)	89 (52.4)		
	3 – 4	9 (32.1)	34 (20.0)		
	≥ 5	1 (3.6)	5 (2.9)		

*χ2 = Chi-square; * = significant at p < 0.05*

workers, long waiting times at the clinics, and discouraging attitude of the healthcare providers. At least 40% of the responses were related to supply-side affordability barriers created by the cost of the screening tests. From the study, only 210/2746 (7.6%) of the women admitted that accessing the location of the screening facilities was a barrier to the uptake of the procedure for them (Table 5).

DISCUSSION

In spite of their awareness of cervical cancer screening and its benefits, only 14.1% of the respondents in this study had ever been screened. This is similar to findings from studies that had consistently documented low rates of screening among women in LMIC, including southwest Nigeria – 10% in Somolu, Lagos [22] and 13.5% in Ibadan, Oyo State [37]. This abysmally low uptake of the intervention is frequently noted among women with poor perception of their risk of developing cervical cancer [13,22], fear of obtaining a positive screen-result, poverty, and in communities with weak health systems without comprehensive screening referrals by health care providers [14,39].

Religion of the respondents in this study was also associated with their decision to utilize cervical cancer screening, a finding similar to that documented by Shrestha et al. [40]. Women's preferences, based on their faith and religious beliefs, should be sensitively factored into all public health strategies aimed at improving cervical

Table 5: Self-reported barriers to cervical cancer screening (number of respondents = 170; multiple options allowed/included)

Determinant	Access barriers	Frequency	Percentage
Access (geographical) (n = 210)			**210/2746 = 7.6%**
Supply-side	Service location	82	39.0
Demand-side	Indirect costs	64	30.5
	Transport means	64	30.5
Availability (n = 1099)			**1099/2746 = 40.0%**
Supply-side	Health workers	170	15.5
	Waiting time	117	10.6
	Staff motivation	123	11.2
	Drugs & consumables	106	9.6
	Non-integrated services	106	9.6
	Lack of opportunity	106	9.6
	Late referral		
Demand-side	Information on healthcare	244	22.2
	Education	127	11.6
Affordability (n = 279)			**279/2746 = 10.2%**
Supply-side	Cost & prices of services	114	40.9
	Private-public practice		
Demand-side	Household resources	55	19.7
	Opportunity costs	55	19.7
	Cash flow	55	19.7
Acceptability (n = 1158)			**1158/2746 = 42.2%**
Supply-side	Billing system		
	Interpersonal skills	123	10.6
Demand-side	Expectations	517	44.6
	Low self-esteem	92	7.9
	Preferences	178	15.4
	Stigma	99	8.5
	Health awareness	149	12.9

cancer screening uptake.

Using the typology designed by Jacobs et al, the commonest class of barriers to the use of cervical cancer screening among the population studied was acceptability. Various studies have identified barriers largely related to poor knowledge, perception and attitude, and this has informed the introduction of programmes to increase awareness and knowledge about cervical cancer and its detection, and encourage positive attitudinal disposition to the screening [3,9,13,22,25,41,42].

The classification employed in this study showed that increasing awareness through information dissemination and education of the populace only addressed 33.8% of the availability barriers. There were more enormous availability and acceptability issues responsible for the non-use of the screening by the respondents. This could explain why studies have shown that despite an improvement in knowledge of cervical cancer and favourable attitude towards its screening, less than one-fifth of women in studies from southwest Nigeria had

ever been screened [2,22,28,37]. Also, affordability and geographical accessibility barriers together constituted less than 20% of the total responses. Thus, addressing the cost barriers alone through financial interventions will certainly not improve uptake of the preventive measure [34].

While a considerable number of studies had listed a bunch of barriers limiting the utilization of cervical cancer screening, only a limited amount of published literature had addressed effective interventions to overcome these barriers [30,31]. The typological segregation of these barriers into demand-side and supply-side components will make it easier to introduce appropriate and effective monetary and non-monetary interventions to eliminate these barriers, thus ensuring increased utilization of cervical cancer screening. These interventions must not only be complementary and comprehensive, they must be introduced concurrently in other to achieve the greatest effect [33,34]. For example, well co-ordinated community participation and social marketing strategies could lead to the design of interventions that will meet the expectations, satisfy the preferences, eliminate the stigma, and improve the self-esteem of women who wish to have the screening (addressing the demand-side of acceptability). Specifically, the use of self-sampling by women for cervical cancer screening is an initiative that could increase acceptability of screening and improve its uptake. This could be complemented with the provision of quality care by ensuring the availability of trained and motivated health workers, drugs and consumables and a performance management scheme that will ensure effective integration of the health services (addressing the supply-side of availability). Another example is the blending of non-monetary interventions like satellite/outreach centres for screening, provision of subsidized/free transportation to health facilities, and religion/culturally-sensitive care (addressing geographical accessibility) with monetary interventions that can protect the women/families from financial harm such as cash transfers after screening, pre-payment for scheduled screening, health insurance schemes and community funds (covering the demand and supply sides of affordability).

Our study has a few limitations. First, a facility-based study may not completely reflect the situation in the community. However, selecting a cohort of screen-aware women across the three tiers of healthcare delivery in the nation makes it more likely that the results from this study will be generalizable to the population of women with similar characteristics. Secondly, qualitative studies are expected to explore perceptions and opinions better than quantitative studies. We addressed this limitation by using an analytical framework which can be adjusted to meet region-specific needs without losing its essence. Thirdly, the interventions and their contextual blends have not been subjected to evaluation with scientific rigour. Real life influences such as policies, legislation, and the resilience of health systems may make them impracticable in many communities. Future research should explore the acceptability from the demand- and supply-side in order to obtain in-depth understanding and chart better interventions. Also, studies should focus on 'modifiers'of the efficiency and effectiveness of the public health interventions, and how the strategic programmes can be combined to produce the biggest benefits to the recipients.

CONCLUSION

The uptake of cervical cancer screening must be significantly increased, especially in LMIC, if the global 90-70-90 objectives must be realized by 2030. The use of the analytical framework will help to segregate barriers to uptake of screening into four dimensions and subthemes, making it easier to design strategies to address these barriers and also evaluate the effectiveness of the various interventions. A comprehensive and complementary blend of interventions targeting demand- and supply-side access barriers using a combination of monetary and non-monetary strategies is most likely to produce the greatest good to the populace. Stakeholders should urgently consider the provision of self-sampling kits and develop awareness and implementation packages to enhance their acceptability, utilization and feedback.

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