

RESEARCH ARTICLE

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Institutional and Demographic Barriers to Cervical Cancer Screening among Women in Rivers State, Nigeria

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Abstract

Objective: The global goal of reaching a 70% cervical cancer screening rate by 2030 can hardly be achieved in the presence of screening constraints, especially in low- and middle-income countries. This study investigated institutional and demographic barriers to cervical cancer screening among women in the Rivers East District of Rivers State, Nigeria. **Methods:** This community-based cross-sectional study sampled 1,200 respondents from a population of 3,871,377 women of reproductive age. Data were collected using a validated questionnaire with a reliability index of 0.83, obtained using Cronbach's alpha. Data collected from the 1,182 valid returned questionnaires were analysed using SPSS version 27, with descriptive statistics (mean and standard deviation) and inferential statistics (multiple regression) at $\alpha = 0.05$. **Results:** The findings of the study revealed that all institutional factors independently reduced screening uptake, $R^2 = 0.271$, $F(4, 1179) = 109.83$, $p < 0.001$; standardized effects were largest for health personnel unavailability ($\beta = -0.203$) and inconvenient clinic hours ($\beta = -0.189$). Demographic determinants were positively associated with uptake, $R^2 = 0.296$, $F(4, 1179) = 123.34$, $p < 0.001$, led by location ($\beta = 0.231$), religion ($\beta = 0.218$), age ($\beta = 0.204$), and marital status ($\beta = 0.089$). **Conclusions:** It was concluded that institutional and demographic factors constituted significant barriers to cervical cancer screening uptake among women in Rivers State and that government intervention is needed to increase staffing levels in screening centres and provide targeted outreach, especially in local communities.

Keywords: Cervical cancer Screening, Institutional barriers, Demographic barriers, Nigeria

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Introduction

Globally, cancer contributes a great deal to morbidity and mortality associated with non-communicable diseases (NCDs). Cervical cancer (CC) is a type of cancer which affects the lower part of the womb (cervix) and is caused by human papillomavirus (HPV) infection. In 2022, 661,021 new cases and 348,189 deaths from cervical cancer were recorded globally [1]. The report shows that more than 85% of these deaths occur in low- and middle-income countries. In Nigeria, cervical cancer accounts

for a large percentage of cancer-related morbidity and mortality, with 14,943 women diagnosed annually and 10,403 deaths in 2018 [2].

With the surge in the prevalence of cervical cancer, screening for early detection was one of the basic prevention and control measures of the disease adopted globally. Early detection and treatment of precancerous lesions are crucial in preventing its progression, underscoring the need for screening among women aged 25–65. The global goal to eliminate cervical cancer as a public health problem has a target of achieving “90-70-

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90% by 2030 [3]. This goal which is interpreted as 90% of girls fully vaccinated with HPV vaccine by age 15; 70% of women screened at least twice in a lifetime (ages 35 and 45); and 90% of women with pre-cancer or cancer receiving appropriate treatment represents three main pillars: prevent, screen and treat. The high incidence and mortality rate in developing countries like Nigeria have been linked to limited access to healthcare and lack of screening programs [4- 6].

Countries, especially the industrialized ones, that have massively and successfully implemented cervical cancer screening (CCS) among its female population have made significant progress in reducing incidence and mortality from the disease [7]. Although several African countries are in the early stages of exploring and developing tailored strategies in cervical cancer prevention and control, records show that most countries in Africa have no organized and sustainable cervical cancer screening programmes mainly because of poor medical infrastructures and funding [8]. Nevertheless, for the available screening services to be impactful, uptake needs to be optimal.

Uptake of cervical cancer screening is the percentage of eligible individuals who participate in recommended screening tests [9]. Higher uptake rates will undoubtedly lead to earlier detection, reduced mortality, and improved public health outcomes [10]. However, studies show low uptake rates among African women [11-12]. For instance, in Cameroon, only 19.6% of women used screening services [13]. In Nigeria, uptake of cervical cancer screening reduced from 13.5% in a 2019 study [14] to 9% [15] in 2022, an indication of possible barriers to uptake.

Many developing countries are reportedly encountering a number of barriers in the implementation of the CCS intervention [8]. Barriers to cervical cancer screening are obstacles that prevent women from accessing cervical cancer screening services [4]. These barriers range from factors associated with the beneficiary of the services to service providers and social circumstances. A variety of strategies targeting individual behaviour/lifestyle changes and government interventions especially in scaling up existing screening services to achieve wider coverage and improving quality of services can be employed. However, scale-up of cervical cancer screening has remained a significant challenge in most low and middle income countries (LMIC) with governments demonstrating inability to address existing barriers to screening services and uptake.

It has been reiterated that inability to access healthcare services significantly impact quality of life, as well as physical and mental health of women [16]. This study was an attempt to determine the institutional and demographic factors that have constituted barriers to the uptake of CCS as perceived by women residing in Rivers State, Nigeria.

The study anchored on the Determinants of Screening upTake model (DOST) propounded by Dsouza and Broucke [17] to explain the roles of institutional and personal barriers in influencing cervical cancer screening uptake in Rivers State of Nigeria. The model categorized determinants into beneficiary-related factors and health system-related factors. This study focused on beneficiary-related factors, specifically socio-demographic profile

referred to here as demographic barriers. It additionally focused on perceived structural and health system related factors which is referred to here as institutional barriers. Demographic variables addressed in this study include age, marital status, religion and location of residence. Institutional variables examined include perceived structural factors namely: availability of service, perceived unavailability of staff, lack of equipment and lack of time to attend screening; and perceived health systems related factors namely: lack of equipment and poor quality staff.

Institutional barriers refer to laws, policies, guidelines, or procedures that systematically disadvantage certain groups of people [18]. These include limited healthcare facilities, insufficient healthcare providers, long waiting times, and high cost of services [19]. These institutional barriers can significantly hinder women from accessing potentially life-saving cervical cancer screening. Understandably, some women may not present themselves for the screening even though they are of age except a doctor or other healthcare provider has recommended [20]. This is because they probably have not felt any signs or symptoms and do not understand the need for pre-cancer screening. Previous researchers have consistently reported poor access [21-25]; lack of qualified healthcare personnel [23, 26, 27]; lack of equipment [23, 26]; cost of service [20-22, 25, 28]; and service time as institutional barriers to the uptake of CCS services.

On another hand, demographic barriers are population characteristics like age marital status, and location that impede healthcare access. Demographic barriers to cervical cancer screening identified by previous researchers include: age [4, 29, 30]; religion [4, 20, 31]; location of residence [4, 32, 33]; and marital status [4, 29]. However, most of these studies were carried out not in Rivers State but in other parts of Nigeria, Africa and globally.

The Rivers State Ministry of Health, the District Primary Healthcare Management Board, and public health NGOs have in the past initiated screening and treatment programmes in government health facilities to raise awareness and reduce maternal mortality. Unfortunately, apathy and poor utilization of healthcare services have consistently been reported among Nigerian women. This situation is worrisome and requires further investigation to document factors constituting barriers to the utilization of healthcare services especially CCS services which are very critical to the elimination of the morbidity and mortality burden posed by cervical cancer. Identifying these barriers is critical for developing targeted interventions.

Materials and Methods

This study is a community-based cross-sectional study. Rivers State is an oil producing state located in the Niger Delta Region of Nigeria. It has a big city, Port Harcourt, which is the capital, few semi-urban, and a lot of rural communities. Most parts of the state are riverine and a lot of the citizens engage in subsistence farming. The population for the study consisted of 3,871,377 females of reproductive age projected yearly from 2006 to 2023 using 3.2% national growth [34].

A sample of 1200 respondents made up of females of reproductive age (25-65) participated in the study. The Taro Ya mane's formula for sample size calculation was used in determining the sample size with the formula $n = \frac{N}{1+N(e^2)}$ which yielded a sample of 399. However, the researchers decided to increase the sample size to 1200 as to avoid unnecessary marginal errors in a study of this kind. A multistage sampling procedure was used in six stages. In the first stage, stratified random sampling technique was used in the selection of 4 Local Government Areas - LGAs (2 urban, 2 rural): Port-Harcourt, Obi/Akpor, Emohua and Ikwerre. From each of the LGAs, three communities were randomly selected using the systematic random sampling technique to arrive at a total of 12 communities. The respondents were sampled from the various women groups accessed during their monthly/quarterly meetings. Hence 100 women were selected from each of the sampled communities using the technique of balloting with replacement.

A structured, adapted instrument titled: Uptake and Barriers to Cervical Cancer Screening Questionnaire (UBCCQ) was used for data collection. The UBCCSQ was made up of 18 items. The UBCCSQ instrument consisted of 2 sections. Section A elicited the demographic variables of the respondents which consisted of 4 items (age of respondents, marital status, religion, location), section B consisted of 14 items on barriers to cervical cancer screening which has Likert-style response option of strongly agree, agree, disagree, and strongly disagree. Barriers to CC screening aspects of the UBCCSQ was adapted from Ama et al. [35] and Ndejjo et al. [36].

The reliability of the UBCCSQ instrument was ascertained using the split- half method of reliability testing. The instruments were administered to a sample of (40) respondents from an area which were outside the study frame namely, Ahoada East in Rivers West Senatorial District, Rivers State. The total set of items(questions) relating to a construct of interest was divided into two parts and then both parts were administered to the 40 selected respondents at the same time and the result obtained from the two subsets of items were coded and analyzed and compared using Cronbach-Alpha. Cronbach-Alpha part 1 was 0.76, Cronbach-Alpha part 2 was 0.82, correlation between forms was 0.704, Cronbach Alpha coefficient otherwise called Guttman split-half reliability coefficients on uptake and barriers to cervical cancer screening sections of the instrument was 0.82.

Data from the 1200 women of reproductive age

were collected by the researchers using the face-to-face direct distribution procedure. Ethical approval to carry out this research was obtained from Ethics and Research Committee of the University of Port Harcourt, Rivers State, Nigeria. The 1200 respondents were given a form containing the study aim, the procedures for filling the questionnaire, conditions of anonymity and consent for participation. Out of the 1200 copies of the questionnaire administered to the respondents, 1182 copies were returned, which gave a percentage return rate of 98.7%.

The Statistical Package for Social Sciences (SPSS) version 27, was used in analyzing the data collected. After retrieving the copies of the questionnaire, the dataset was cleaned and coded. Descriptive statistics of simple percentage was used in analyzing the demographic variables and the results from demographic variables are presented in charts. A multiple Regression analysis was done to establish the institutional and demographic factors influencing the cervical cancer screening uptake.

Results

Analysis of demographic data (Figure 1) showed that majority, 510 (43.1%) of the respondents were within the age bracket of 25-29years, followed by those in the age bracket of 30-35, 201 (17.0%) and the least were those in the age bracket of 40-44years, 136 (13.8%). Also, Figure 2 showed that there were 412 (34.8%) single female residents that took part in the study. One hundred and ninety-five (16.5%) were married, while 102 (8.6%) were separated from their marriage. Regarding religion of the respondents (Figure 3), 538 (45.4%) were Christians, 333 (28.1%) were traditionalists and 313(26.4%) were Muslims. Information contained in Figure 4 showed that majority of the residents lived in the rural areas

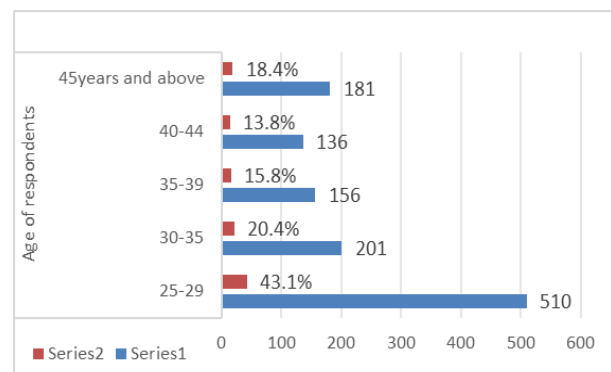


Figure 1. Age Distribution of the Residents

Table 1. Regression Analysis of the Institutional Factors Influencing Cervical Cancer Screening Uptake Residents in Rivers East Senatorial District, Rivers State

Predictor	B (Unstd.)	Std. Error	Beta (β)	t-value	Sig. (p)
(Constant)	4.125	0.189	—	21.82	0
Lack of Equipment (X ₁)	-0.133	0.041	-0.179	-4.56	0
Health Personnel Unavailability (X ₂)	-0.195	0.043	-0.203	-4.98	0
Inconvenient Clinic Time (X ₃)	-0.214	0.047	-0.189	-4.15	0
Low-Quality Resources (X ₄)	-0.187	0.039	-0.121	-3.41	0.001

Model Fit: R² = 0.271; Adjusted R² = 0.267; F(4, 1179) = 109.83, p < .001

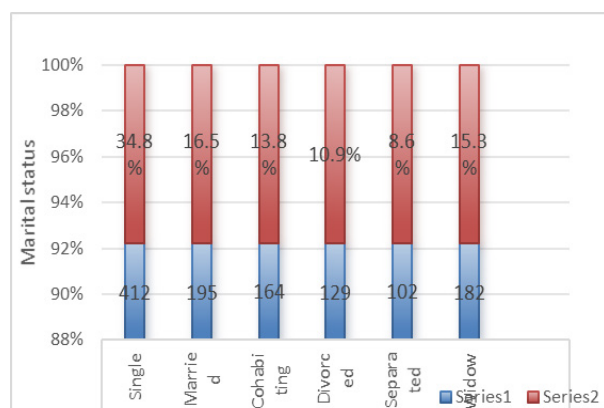


Figure 2. Distribution of the Respondents by Marital Status

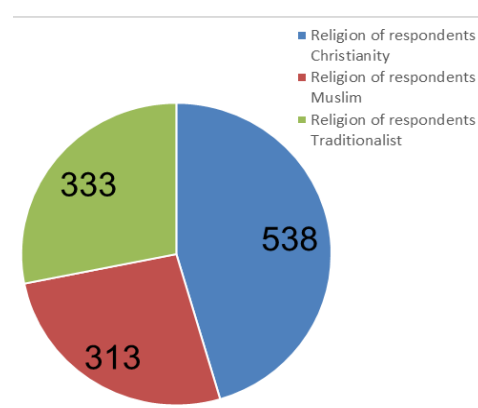


Figure 3. Distribution of the Respondents by Religion

Table 2. Regression Analysis of the Demographic Factors Influencing Cervical Cancer Screening Uptake Residents in Rivers East Senatorial District, Rivers State

Predictor	B (Unstd.)	Std. Error	Beta (β)	t-value	Sig. (p)
(Constant)	2.105	0.172	—	12.24	0
Age (X_1)	0.212	0.038	0.204	5.58	0
Marital Status (X_2)	0.097	0.041	0.089	2.37	0.018
Religion (X_3)	0.226	0.039	0.218	5.79	0
Location (X_4)	0.241	0.037	0.231	6.51	0

Model Fit: $R^2 = 0.296$; Adjusted $R^2 = 0.293$; $F(4, 1179) = 123.34$, $p < 0.001$

(Emohua and Ikwerre LGAs) 603 (50.9%), other of their counterparts lived in Port-Harcourt and Obio-Akpo LGAs (Urban) 581 (49.1%).

The regression results for institutional factors affecting cervical cancer screening uptake in Rivers East Senatorial District (Table 1) showed that the model is statistically significant ($F(4, 1179) = 109.83$, $p < .001$), explaining 27.1% of the variance ($R^2 = 0.271$). All predictors significantly and negatively influenced screening uptake. The strongest effect is from health personnel unavailability ($\beta = -0.203$), followed by inconvenient clinic time ($\beta = -0.189$), lack of equipment ($\beta = -0.179$), and low-quality resources ($\beta = -0.121$). also, the high F statistics of ($F(4, 1179) = 109.83$, $p < .001$) revealed that there is a statistically significant difference in the influence

of these institutional barriers on the uptake of cervical cancer screening.

Table 2 displays the regression analysis of demographic factors influencing cervical cancer screening uptake among residents in Rivers East Senatorial District. The model accounts for 29.6% of the variance in screening uptake ($R^2 = 0.296$), with a significant model fit ($F(4, 1179) = 123.34$, $p < .001$). All four demographic predictors have statistically significant positive effects. Location ($\beta = 0.231$) has the strongest influence, followed by religion ($\beta = 0.218$), age ($\beta = 0.204$), and marital status ($\beta = 0.089$). These results indicate that geographic location, religious affiliation, and age are key demographic factors driving cervical cancer screening behavior in the State.

■ Location of respondents Port-Harcourt and Obio-Akpo(Urban)
 ■ Location of respondents Emohua and Ikwerre(Rural)

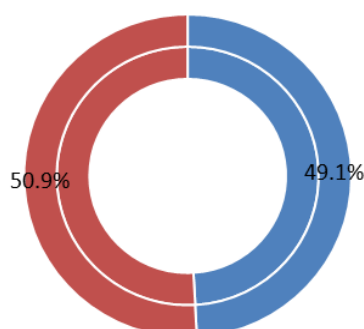


Figure 4. Distribution of the Respondents by Location

Discussion

This study examined how institutional and demographic factors shape women's participation in cervical cancer screening in Rivers State. It assessed perceived service barriers and demographic characteristics to explain uptake patterns.

The study found that the key institutional determinants shaping cervical cancer screening were health personnel unavailability and inconvenient clinic time, which women experienced most directly as empty clinics or hours that do not fit their daily routines. Low-Quality Resources also discouraged attendance, but to a lesser extent, while Lack of Equipment was noted yet mattered less than time and staff presence.

The dominance of clinic time and inadequate staffing as key constraints to uptake of cervical cancer screening

is widely reported across low- and middle-income settings. Systematic reviews link rigid facility schedules to high time costs for women juggling unpaid care and informal work, with predictable drops in preventive uptake when hours are inflexible [21, 22]. The findings of a study by Mugassa and Frumence [26] echo that irregular staffing erodes confidence and creates missed opportunities during routine contacts, especially where reminder systems are weak. Similarly, a study in Cameroon found that long waiting hours at the clinic and health worker scarcity suppress participation in cervical cancer screening [29]. Furthermore, some reviews of cost barriers agree that financial strain matters but often interacts with time and reliability costs, not replacing them [28, 24]. These studies collectively validate the findings of this study that institutional factors remain critical impediments to women uptake of cervical cancer screening.

However, not all studies agreed with the findings of this study. While several African reviews position equipment scarcity as the primary structural obstacle [23], women in this study judged time and personnel as more constraining. This may reflect recent hardware improvements in our setting or a sharper sensitivity to day-to-day logistics after service disruptions. One of the significance of this study's findings is the insight that programmatic changes to cervical cancer screening in Rivers State should start with re-engineering access by extending clinic hours, adding weekend and evening slots, and stabilising staffing rosters. Research consistently shows that flexible scheduling increases health service use by accommodating the realities of women's care-giving and work responsibilities [22]. These modifications, alongside mobile or outreach days, can target peripheral settlements and markets, where proximity remains a major barrier [21].

On the demographic angle, location was the strongest determinant because it reflects transport options, safety, and proximity to functioning facilities. Religion influenced norms and encouragement from faith groups. Age mattered as older women felt more at risk and had more contact with care. Marital Status had a smaller effect through support and decision making at home. Qualitative work by Ndejjo et al. [36] shows that religion functions as a social pathway through which stigma is reduced and screening is normalised via trusted messengers. Patterns of age-related uptake are also consistent with studies where older women, perceiving higher risk and having more system contact, are more likely to screen [14]. Faith and women groups are trusted messengers that can bridge the gap between knowledge and action, as seen in studies where community-based interventions have increased health service uptake [39]. Within facilities, standardising client flow and integrating screening prompts into routine encounters are simple yet effective solutions for making health visits predictable, an approach shown to improve patient adherence in diverse settings [37]. Finally, prioritising equity by tracking participation across location, age, and religion ensures that resources are focused where they are most needed, in line with calls for data-driven planning in health systems [22].

The Andersen's Behavioral Model clarifies how our

findings arise from predisposing, enabling, and need factors in combination. Predisposing factors such as age, marital status, and religion shape beliefs and readiness to act, which mirrors evidence that social position and norms condition screening intent [37]. Enabling factors capture the service context; here inconvenient clinic time, health personnel unavailability, low quality resources, lack of equipment, and location limit practical access, consistent with reviews showing that the model works well for qualitative and service design questions [38]. Need factors reflect perceived risk which tends to rise with age and contact with care, a pathway also seen in cancer screening research that applies Andersen to women's services use [39]. The strong effects of time and staffing suggest giving temporal access and provider continuity greater weight, and treating location as a bundle of transport, safety, and local information.

In conclusions, the study demonstrates that cervical cancer screening uptake in Rivers State is constrained by institutional factors which are related to service delivery. Demographically, location, religion, age, and marital status shape the uptake, with location exerting the greatest influence, indicating that geography encapsulates transport, safety, information flow, and facility density. The evidence supports an Andersen style account in which predisposing and enabling conditions jointly predict behaviour. Consequently, the credible pathway to rapid gains is to re-time and increase reliable staff for better services. Also, it suggest the need to extend outreach to rural areas, and embed local data use to target efforts by place and subgroup. Investments in equipment should complement, not precede, these changes. Policy and program design that align access, provider continuity, and community engagement can translate intention into sustained screening.

Recommendations

Based on the study findings, the following recommendations were made:

1. Rivers State Ministry of Health and the Primary Health Care Board should extend clinic hours to evenings and weekends and publish monthly timetables per facility, using shift rosters and small overtime allowances to ensure predictable access for women who work or provide care during the day.

2. Local Government Health Authorities and facility managers should make screening an opt-out offer during routine services such as antenatal care, postnatal visits, family planning, immunisation, and outpatient checks using simple prompts in registers, same-day referrals, and SMS reminders to convert routine contact into completed screening.

3. State Monitoring and Evaluation units with LGA health teams should deploy a one-page dashboard that tracks screening uptake by ward, age group, and faith community, review the data monthly with facility heads and community leaders, and adjust outreach and staff deployment accordingly so resources follow areas of lowest coverage.

4. The government should increase the staff size, carry out targeted outreach especially to the local communities.

Author Contribution Statement

All authors contributed equally in this study.

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