



Awareness Levels and Attitudinal Barriers to Cervical Cancer Screening: A Comparative Study of Urban and Rural Women in Plateau State, Nigeria.

Aminat Omope Yusuf¹, Ebenezer Kolawale Adeosun³, Chukwuekezie Chidiebere Nkemakonam⁵, Timothy Olugbenga Ogundeko², Ethel Ihemjiaba Ekam⁴, Catherine Nadabo¹, Michael Kehinde Olujoba⁶

¹Department of Medical Microbiology and Parasitology, College of Medical Sciences, Bingham University, Jos Campus, Nigeria.

²Department of Pharmacology and Therapeutics, College of Medical Sciences, Bingham University, Jos Campus, Nigeria.

³Department of Medical Laboratory Sciences, College of Allied Health Sciences, McPherson University.

⁴Department of Health Planning, Federal Ministry of Health, FCT Abuja.

⁵Department of Medical Microbiology, Federal Medical Center, Birnin Kudu, Jigawa, Nigeria.

⁶Department of Medical Microbiology, Our Lady of Apostle Hospital Jos.

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ABSTRACT

Cervical cancer remains a major public health concern in low- and middle-income countries, including Nigeria, where inadequate awareness and low utilization of screening services contribute significantly to late diagnosis and high mortality. **Objective:** This study assessed and compared awareness and attitudinal barriers to cervical cancer screening among women in urban and rural areas of Plateau State, Nigeria. **Method:** A comparative cross-sectional study design was adopted, involving 203 women aged 21–65 years selected through multistage sampling from Jos Metropolis (urban) and Bassa Local Government Area (rural). Data were collected using a structured interviewer-administered questionnaire that assessed socio-demographic characteristics, awareness of cervical cancer and screening methods, and attitudes toward screening and HPV vaccination. Data was analyzed using IBM SPSS version 27. Descriptive statistics summarized key variables, while binary logistic regression identified factors associated with cervical cancer awareness, with statistical significance set at $p < 0.05$.

INTRODUCTION

Cervical cancer continues to pose a major public health concern worldwide, especially in low- and middle-income countries, where more than 85% of global deaths from the disease occur (World Health Organization [WHO], 2023). Although cervical cancer is largely preventable and highly treatable when detected early, it still contributes significantly to illness and death because many women are not screened, often present late, and lack access to essential preventive healthcare services. Persistent infection with high-risk human papillomavirus (HPV) types remains the main cause of cervical cancer, and the long period before the disease becomes invasive offers a vital opportunity for early detection through screening methods such as the Papanicolaou (Pap) smear and Visual Inspection with Acetic Acid (VIA) (Bruni et al., 2021).

In Nigeria, cervical cancer is one of the leading causes of cancer-related deaths among women, second only to breast cancer in both incidence and mortality (International Agency for Research on Cancer [IARC], 2023). Each year, thousands of new cases are reported (Okunade, 2020). Despite the availability of effective screening approaches, the number of women who undergo screening remains very low—between 5% and 15%—a figure far below the WHO recommendation of 70% coverage (WHO, 2020; Akinyemiju et al., 2018). Routine screening has been shown to significantly reduce both the incidence of cervical cancer and related deaths by identifying precancerous changes before they progress (Sankaranarayanan et al., 2019). Yet, gaps in awareness, attitudes, and service utilization persist, especially between urban and rural populations.



Cervical cancer begins in the cervix and is usually caused by persistent infection with high-risk HPV types, particularly HPV 16 and 18, which account for nearly 70% of cases worldwide (WHO, 2023). The disease progresses slowly over several years, moving from precancerous lesions to invasive cancer, a pattern that makes it highly preventable when effective screening and early treatment are available. Globally, cervical cancer is the fourth most common cancer among women, following breast, colorectal, and lung cancers. Recent global estimates show about 600,000 new cases and more than 340,000 deaths each year (IARC, 2023).

Despite improvements in prevention and treatment, the disease remains disproportionately burdensome in low- and middle-income countries, which account for nearly 90% of global deaths. These inequalities largely stem from limited access to screening services, inadequate HPV vaccination coverage, weak health systems, and frequent delays in diagnosis (Bray et al., 2018).

Sub-Saharan Africa has the highest rates of cervical cancer incidence and mortality worldwide, with incidence rates in many countries exceeding 30 per 100,000 women—far above the fewer than 10 per 100,000 seen in high-income countries (IARC, 2023). Mortality remains high across the region due to late-stage diagnosis and limited availability of diagnostic and treatment facilities. Low awareness, cultural barriers, insufficient health system capacity, and poor implementation of screening and vaccination programs all contribute to these outcomes (Sung et al., 2021).

In Nigeria, cervical cancer remains a major health concern, with more than 12,000 new cases and around 8,000 deaths recorded each year (IARC, 2023). Most women are diagnosed at advanced stages, when treatment options are limited and survival rates are poor (Okunade, 2020). National screening rates remain below 10%, hindered by low awareness, cost, fear, cultural norms, and limited-service availability, especially in rural communities (Akinyemiju et al., 2018; Nwankwo et al., 2019).

The situation in Plateau State mirrors Nigeria's broader pattern. Although screening services such as Pap smears and VIA are available in tertiary and some secondary healthcare facilities, utilization remains inadequate. Urban areas like Jos metropolis have better access to healthcare and trained professionals, yet screening uptake is still low. Rural areas, such as Bassa Local Government Area, face additional obstacles, including limited health infrastructure, long distances to facilities, low health literacy, and deep-rooted cultural beliefs that further discourage screening (Eze et al., 2021). These disparities highlight the need for targeted strategies that address both urban and rural contexts to improve awareness, attitudes, and screening practices.

Awareness of cervical cancer and its screening options is a major factor influencing screening uptake, yet it remains low in many low- and middle-income countries, particularly among rural women (WHO, 2023). Awareness encompasses understanding risk factors like persistent HPV infection, knowing available screening methods, knowing when screening should occur, and understanding the benefits of early detection. Studies in Nigeria consistently show that urban women tend to have higher levels of awareness due to better access to education, health information, and healthcare services (Hyacinth et al., 2012; Nwankwo et al., 2019). Rural women, however, often have limited knowledge of the disease and its preventability, a challenge worsened by misconceptions and low literacy levels (Abiodun et al., 2014; Eze et al., 2021).

Attitudes toward cervical cancer screening also play a major role in determining whether women undergo screening. Fear—whether of the procedure, pain, embarrassment, or the possibility of a positive result—is one of the most frequently cited attitudinal barriers (Okunade, 2020). Misconceptions about personal risk further reduce uptake, especially among women who are asymptomatic, older, or no longer sexually active (Abotchie & Shokar, 2009). Cultural and religious beliefs often restrict open discussions about reproductive health and, in some cases, require spousal approval before screening (Eze et al., 2021). Mistrust of healthcare systems, particularly in rural areas, also discourages screening, especially when women fear misdiagnosis or poor treatment outcomes (Nwankwo et al., 2019). Positive attitudes, however, are more common among women with higher education, previous healthcare engagement, counseling, peer support, or exposure to community education programs (Hyacinth et al., 2012; Akinyemiju et al., 2018).

Urban–rural comparisons across Nigeria and sub-Saharan Africa consistently show that urban women are more likely to undergo screening due to better infrastructure, closer proximity to health facilities, higher socioeconomic status, and broader exposure to health information (Bruni et al., 2021; Sung et al., 2021). Rural



women continue to face misconceptions, negative attitudes, and numerous logistical constraints such as long travel distances, transportation costs, limited personnel, time pressures, and domestic responsibilities, all of which contribute to low screening turnout (Eze et al., 2021).

Despite the existing body of research, few studies in Plateau State have examined awareness and attitudinal barriers by directly comparing urban and rural women, leaving a notable gap in the literature. The present study aims to address this gap by assessing awareness and attitudes toward cervical cancer screening among women in Jos metropolis and Bassa Local Government Area. The findings are expected to guide interventions and policies that reduce urban–rural inequalities and improve screening uptake (Bruni et al., 2021; Sung et al., 2021; Eze et al., 2021).

METHODOLOGY

Study Design

This study adopted a comparative cross-sectional study design to assess and compare levels of awareness and attitudes toward cervical cancer screening among women in urban and rural settlements of Plateau State, Nigeria. The design is appropriate for describing population characteristics and identifying differences between groups at a single point in time. By comparing urban and rural respondents simultaneously, the study provides insights into how place of residence influences awareness and attitudinal barriers to cervical cancer screening.

Study Locations

The study was conducted in Plateau State, specifically in selected urban and rural settlements: Urban settlements: *Jos North and Jos South Local Government Areas*, which together constitute Jos Metropolis. These areas represent the state capital and are characterized by relatively better access to healthcare facilities, higher concentration of health professionals, and greater exposure to health information through media and organized health programs. Rural settlement: *Bassa Local Government Area*, a predominantly rural area with dispersed communities, limited healthcare infrastructure, and reduced access to preventive health services, including cervical cancer screening.

The selection of these locations was based on their contrasting urban–rural characteristics, which are central to the comparative nature of the study.

Study Population

The study population comprised women aged 21–65 years residing in Jos North, Jos South, and Bassa Local Government Area. Only women who had lived in the selected areas for at least six months were eligible to participate, to ensure adequate exposure to the health and social environments of the study locations. This age range aligns with international and national cervical cancer screening recommendations, which target sexually active adult women who are at risk of developing cervical cancer.

Inclusion and Exclusion Criteria

Inclusion criteria:

- Women aged 21–65 years
- Permanent residents of the selected urban or rural areas for ≥ 6 months
- Women who were present during the period of data collection
- Women who provided informed consent to participate in the study

Exclusion criteria:

- Women with a previous diagnosis of cervical cancer
- Women currently undergoing treatment for cervical cancer
- Women who declined consent or were too ill to participate at the time of data collection



These criteria were applied to ensure that participants could reliably report awareness and attitudes without bias introduced by prior diagnosis or treatment experience.

Sample Size Determination

The sample size was determined using the formula for comparing two proportions, based on expected differences in awareness of cervical cancer screening between urban and rural women. The following assumptions were used: Estimated awareness among urban women: 50% (used to maximize sample size), Estimated awareness among rural women: 35%, Confidence level: 95% and Power: 80% Based on these assumptions, a minimum sample size of approximately 250 respondents per group was calculated. After adjusting for possible non-response and incomplete questionnaires, the final targeted sample size was approximately 200 women.

In practice, a total of 204 women successfully participated in the study, drawn from both urban (Jos North and Jos South) and rural (Bassa LGA) settlements. This sample size was considered adequate to meet the study objectives and allow for meaningful comparative analysis.

Sampling Method

A multistage sampling technique was employed to select participants from both urban and rural areas.

Urban sampling (Jos North and Jos South): Selected wards within Jos North and Jos South LGAs were chosen using simple random sampling, within selected wards, households were randomly selected, systematic sampling was then used to identify eligible women within households, Where more than one eligible woman was present, simple random selection was applied.

Rural sampling (Bassa LGA): Villages were selected using simple random sampling, households within selected villages were chosen systematically, eligible women were identified and randomly selected for participation. This approach ensured representativeness while minimizing selection bias in both urban and rural settings.

Data Collection Tools and Procedure

Data was collected using a structured questionnaire specifically designed for this study, drawing on previously validated instruments used in cervical cancer screening research. The questionnaire was structured into the following sections: Socio-demographic characteristics (age, marital status, education, occupation, residence), awareness of cervical cancer and screening (knowledge of cervical cancer, risk factors, screening methods, and sources of information), attitudes and perceived barriers to screening, assessed using Likert-type scale items covering fear, perceived susceptibility, cultural beliefs, stigma, and trust in health facilities

The questionnaire was pretested in a population with similar characteristics outside the study areas to ensure clarity, validity, and reliability. Necessary adjustments were made based on feedback from the pretest. Data collection was conducted through face-to-face interviews by trained research assistants to enhance response accuracy and accommodate participants with limited literacy.

Method of Sample Collection:

Prior to data collection, informed consent was obtained from all participants. Interviews were conducted in English and local languages, depending on the participant's preference. Both electronic questionnaires (using tablets or mobile devices) and hard-copy paper questionnaires were utilized to ensure flexibility and completeness of data collection, especially in rural areas with limited internet or power supply. Completed paper questionnaires were later checked for completeness and entered the electronic database.

Data Management and Statistical Analysis

Collected data were cleaned, coded, and entered into IBM SPSS Statistics using version 27 for analysis. Descriptive statistics: Frequencies, percentages, means, and standard deviations were used to summarize sociodemographic variables, awareness levels, and attitude scores. Binary logistic regression was performed to identify predictors of cervical cancer screening awareness and positive attitudes, controlling for potential confounders such as age, education, and residence. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1: Awareness of Cervical Cancer Among Respondents (N = 203)

Q1. Awareness of Cervical Cancer		
Response	Frequency (n)	Percentage (%)
Yes	67	33
No	136	67
Total	203	100
Q2. Knowledge of Causes of Cervical Cancer		
Perceived Cause	Frequency (n)	Percentage (%)
Human Papillomavirus (HPV)	57	28.1
Smoking	7	3.4
Poor hygiene	7	3.4
Multiple sexual partners	6	3
Early sexual activity	4	2
Combination of causes	14	6.9
I don't know	111	54.7
Total	203	100
<i>Note: "Combination of causes" includes all multiple-response options reported by respondents.</i>		
Q3. Knowledge of Symptoms of Cervical Cancer		
Reported Symptom	Frequency (n)	Percentage (%)
Abnormal vaginal bleeding	161	79.3
Unusual vaginal discharge	32	15.8
Pelvic pain	1	0.5
All of the above	9	4.4
Total	203	100

Table 2: Attitude Towards HPV Vaccination and Cervical Cancer Screening (N = 203)

Variable	Category	Frequency (n)	Percentage (%)
Willingness to take or recommend HPV vaccine	Yes	149	73.4
	No	54	26.6
Ever had Pap smear or HPV test	Yes	22	10.8
	No	181	89.2
Time of last screening test	Recently	6	3
	6 months ago	2	1
	1 year ago	6	3
	2 years ago	6	3
	Never	183	90.1
Reasons for not getting screened	No symptoms	27	13.3
	Recently screened	20	9.9
	Fear of results	6	3
	Lack of awareness	147	72.4
	High cost	3	1.5
Openness to HPV vaccination (if not vaccinated)	Yes	66	32.5
	No	137	67.5



Table 3: Sociodemographic Characteristics of Respondents (N = 203)

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Age Distribution	Age Group	Frequency (n)	Percentage (%)
	14–24 years	97	47.8
	25–34 years	48	23.6
	35–44 years	44	21.7
	≥45 years	14	6.9
	Total	203	100
Level of Education	Educational Level	Frequency (n)	Percentage (%)
	Ph.D	5	2.5
	Master's	6	3
	Bachelor's (B.Sc)	25	12.3
	Diploma	33	16.3
	Secondary education	46	22.7
	Primary education	5	2.5
	No formal education*	83	40.9
Total	203	100	
Occupation	Occupation	Frequency (n)	Percentage (%)
	Farmer	107	52.7
	Self-employed	49	24.1
	Student	21	10.3
	Health worker	11	5.4
	Unemployed	10	4.9
	Civil servant	5	2.5
Total	203	100	
Marital Status	Marital Status	Frequency (n)	Percentage (%)
	Married	110	54.2
	Single	91	44.8
	Divorced	2	1
Total	203	100	
Location Based	Location	Frequency	Percent
	Bassa(Rural Area)	92	45.3
	Jos Metropolis(Urban Area)	111	54.7
	Total	203	100.0

RESULTS

The findings reveal generally low awareness of cervical cancer among the respondents. As shown in Table 1, only 33.0% had ever heard of cervical cancer, while the majority (67.0%) reported no prior awareness. More than half of the respondents (54.7%) did not know the cause of cervical cancer, although 28.1% correctly identified Human Papillomavirus (HPV) as the primary causative agent. With regard to symptoms, most participants (79.3%) recognized abnormal vaginal bleeding, but only 15.8% identified unusual vaginal discharge and 0.5% identified pelvic pain. Overall, only 4.4% demonstrated comprehensive knowledge by identifying all listed symptoms.

Table 2 shows that nearly half of the respondents (47.8%) were aged 14–24 years, indicating that the sample was predominantly young. Educational attainment was low, with 40.9% having no formal education and only 5.5% reporting postgraduate qualifications. This has critical implications for health literacy and the level of understanding related to cervical cancer and its screening. Over half of the respondents (52.7%) were farmers, reflecting a largely rural population structure. A slight majority (54.2%) were married, while 44.8% were single.

Findings presented in Table 3 show that although 73.4% of the respondents expressed a positive attitude toward HPV vaccination, actual utilization of cervical cancer screening services was extremely low. Only 10.8%



reported having undergone screening, while 89.2% had never been screened. Similarly, 90.1% confirmed they had no history of screening. The primary barrier to screening was lack of awareness (72.4%). Other barriers included absence of symptoms (13.3%), fear of results (3.0%), and high cost (1.5%). When asked about willingness to be screened, only 32.5% expressed willingness, while 67.5% were unwilling.

According to Table 4, level of education emerged as a strong and statistically significant predictor of cervical cancer awareness ($p < 0.001$). Women with higher educational levels were 2.4 times more likely to have heard of cervical cancer than those with lower education. Place of residence was also a significant determinant ($p = 0.010$). Women residing in rural areas (Bassa) had approximately 79% lower odds of being aware of cervical cancer compared to those living in urban areas (Jos Metropolis). Although younger age groups had lower odds of awareness relative to women aged 45 years and above, these differences were not statistically significant ($p > 0.05$). Occupation ($p = 0.170$) and marital status ($p = 0.404$) were not significantly associated with awareness. The extremely large coefficients and odds ratios indicate quasi-complete separation in the model.

The study findings highlight a generally low level of cervical cancer awareness, with nearly one-third of respondents reporting no knowledge of the disease. This pattern is consistent with trends widely documented across sub-Saharan Africa and other low- and middle-income countries (Abiodun et al., 2014; Eze et al., 2012). Poor awareness remains a key contributor to delayed health-seeking behavior, low screening uptake, and persistently high cervical cancer mortality rates in resource-limited settings (WHO, 2022). Among respondents who had some awareness, health facilities were the primary source of information, underscoring the important role that healthcare workers play in educating women (Oyedunni & Opemipo, 2012). Community outreach programs also contributed significantly, supporting the effectiveness of community-driven strategies in reaching women with limited formal education (Ndikom & Ofi, 2012). In contrast, mass media and social media played relatively minor roles in dissemination, which differs from findings in high-income settings where digital platforms dominate health information sharing (Dunn et al., 2017).

Preferred educational approaches further reinforced the importance of trusted, community-oriented channels. School-based programs were the most preferred, reflecting high trust in educational institutions as credible venues for delivering long-term health education (Hoque et al., 2014). Community outreach, as well as church and mosque-based health talks, were also highly favored, demonstrating the value of culturally sensitive and faith-based approaches that align with community norms (Adekanle et al., 2011; Adejuyigbe et al., 2015). Social media was the least preferred method, likely due to limited digital access and unfamiliarity with online health resources—an issue common in low-resource environments (Akinlotan et al., 2017). Overall, these preferences highlight the need for integrated, community-based education strategies consistent with global recommendations emphasizing local engagement in cervical cancer prevention (WHO, 2022).

The sociodemographic profile of respondents further illuminates the context of the findings. Nearly half were young women aged 14–24 years, similar to studies in Nigeria and other African countries where young women are more accessible for survey participation (Eze et al., 2012; Adekanle et al., 2011). However, younger women often perceive themselves as being at low risk, contributing to poor screening uptake (Binka et al., 2016). The high number of women with no formal education is concerning, as low educational attainment is strongly associated with reduced health literacy, poor awareness of cervical cancer, and low participation in screening programs (Ndikom & Ofi, 2012; Abiodun et al., 2014). The predominance of farming as the major occupation indicates a largely rural, economically constrained population with limited access to healthcare facilities and information (Akinlotan et al., 2017). While many respondents were married, which can increase healthcare engagement through reproductive services, cultural norms and spousal influence may limit autonomous decision-making regarding screening (Ezeanochie & Olagbuji, 2014). These demographic characteristics provide essential context for understanding the low awareness and low screening participation observed.

Although respondents expressed generally positive attitudes toward HPV vaccination, screening uptake remained extremely low, reflecting a discrepancy reported in numerous studies across Nigeria and other African countries (Ndikom & Ofi, 2012; Eze et al., 2012). Lack of awareness was the most prominent barrier to screening, consistent with previous research showing that inadequate knowledge and misconceptions—such as believing screening is unnecessary without symptoms—significantly reduce screening participation (Abiodun et al., 2014; Adekanle et al., 2011; WHO, 2022). Fear and cost played comparatively minor roles, suggesting that



informational gaps rather than socioeconomic or psychological barriers are the primary challenges in this population. Although attitudes toward HPV vaccination were favorable, low willingness among unvaccinated women reflects vaccine hesitancy influenced by misinformation, cultural beliefs, and uncertainty about vaccine safety (Dunn et al., 2017).

CONCLUSION

Overall, the findings highlight substantial deficits in awareness and knowledge of cervical cancer, particularly regarding its causes, symptoms, and preventive strategies. Addressing these gaps requires sustained health education interventions. Such programs should emphasize the role of HPV, the importance of screening regardless of symptoms, and the benefits of HPV vaccination. Evidence supports the effectiveness of community-based education, school-centered initiatives, and counseling by healthcare providers in improving awareness and promoting preventive behaviors (Adekanle et al., 2011; WHO, 2022).

Education and place of residence are critical determinants of cervical cancer awareness. Targeted interventions focusing on women with low or no formal education and those living in rural areas are urgently needed. Community outreach programs, adult education initiatives, and rural-focused awareness campaigns could significantly improve awareness and contribute to earlier screening and prevention, consistent with World Health Organization recommendations (WHO, 2022).

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