

## Determinants of Cervical Cancer Screening Uptake Among Women Attending Antenatal Care Services in Gombe Hospitals

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### ABSTRACT

**Background:** Cervical cancer is a significant public health concern and a leading cause of cancer-related morbidity among women globally, especially in low-resource settings where screening coverage remains low.<sup>[1]</sup> Though effective screening methods exist, uptake is limited due to various socio-cultural, educational, and healthcare system barriers.<sup>[2]</sup>

**Objective:** This study aimed to identify the determinants influencing cervical cancer screening uptake among women attending antenatal care (ANC) services in Gombe hospitals.

**Methods:** A cross-sectional descriptive study was conducted among 400 women attending ANC clinics in Gombe, Nigeria, selected via systematic random sampling. Data were collected through interviewer-administered structured questionnaires capturing socio-demographic data, awareness, knowledge, attitudes, and health-seeking behaviors related to cervical cancer screening. Logistic regression analysis identified factors associated with screening uptake.

**Results:** Among participants, 28% (112/400) had undergone cervical cancer screening. Higher educational level (OR=2.5, 95% CI: 1.4–4.3), previous health education on cervical cancer (OR=3.1, 95% CI: 1.8–5.4), and healthcare provider recommendation (OR=4.2, 95% CI: 2.3–7.8) significantly increased the likelihood of screening. Barriers included cultural beliefs, fear, and lack of awareness. Women with good knowledge about cervical cancer were more likely to participate in screening ( $p < 0.001$ ).

**Conclusion:** Enhancing health education, encouraging healthcare provider recommendations, and addressing cultural barriers could increase cervical cancer screening uptake among women in Gombe. Targeted interventions are crucial to improve early detection and reduce cervical cancer burden.

## INTRODUCTION

Cervical cancer remains one of the most common gynecological malignancies and continues to be a major public health concern worldwide. It is a significant cause of cancer-related morbidity and mortality among women, especially in low- and middle-income countries (LMICs). According to the World Health Organization, an estimated 604,000 new cases of cervical cancer occur annually, leading to approximately 342,000 deaths globally <sup>[1]</sup>. The burden of cervical cancer is particularly pronounced in LMICs, where screening and preventive services are often inadequate or inaccessible. This disparity is due to a combination of factors, including limited healthcare infrastructure, lack of awareness, and socio-economic challenges that hinder timely detection and treatment.

In Nigeria, cervical cancer is the second most common cancer among women, accounting for nearly 14% of all female cancers <sup>[3]</sup>. The high prevalence is compounded by low screening coverage, with estimates suggesting that less than 10% of eligible women have ever undergone screening in many communities <sup>[4]</sup>. This low uptake is troubling because early detection through screening significantly reduces the risk of progression to invasive disease, thereby decreasing mortality rates. Screening methods such as Pap smear cytology and human papillomavirus (HPV) testing are proven to be effective tools for early diagnosis and prevention. They enable the identification of precancerous lesions that can be treated before progressing to invasive cancer, thus serving as crucial components of a comprehensive cervical cancer control strategy <sup>[5]</sup>.

Despite the availability and proven efficacy of these screening methods, numerous barriers hinder their widespread adoption. These include low awareness of cervical cancer and its risk factors, cultural beliefs and misconceptions, fear of diagnosis or stigma, limited access to healthcare facilities, and economic constraints that make screening unaffordable or logistically challenging <sup>[6,7]</sup>. For instance, fear of shame or social stigma associated with pelvic examinations, along with traditional beliefs and misconceptions about the causes and prevention of cervical cancer, often discourage women from seeking screening services <sup>[8]</sup>.

Understanding the multifaceted determinants that influence a woman's decision to participate in cervical cancer screening is essential for designing effective interventions. Identifying those factors—ranging from individual

knowledge and attitudes to healthcare system barriers—can inform targeted strategies to improve screening uptake. Factors such as educational attainment, awareness levels, healthcare provider recommendations, cultural perceptions, and socio-economic status have been shown to significantly impact screening behaviors in various Nigerian studies <sup>[6,9]</sup>.

However, research specific to Gombe State—a region with distinct cultural and socio-economic characteristics—is limited. Gombe's unique demographic profile, healthcare infrastructure, and cultural practices may influence women's health-seeking behaviors differently from other regions. Therefore, this study aims to explore the determinants of cervical cancer screening among women attending antenatal care (ANC) services in Gombe hospitals. The findings will contribute to the body of knowledge necessary for developing culturally appropriate and context-specific interventions, ultimately aiming to increase screening uptake and reduce the burden of cervical cancer in this underserved region.

## **Methods**

### **Study Design and Setting**

This study employed a cross-sectional descriptive design, conducted within healthcare facilities to explore the determinants influencing cervical cancer screening uptake among women attending antenatal care (ANC) clinics. The cross-sectional approach allowed for the collection of data at a single point in time, providing a snapshot of screening behaviors and associated factors across different settings within Gombe State, Nigeria.

The study was carried out over a four-month period, from March to June 2024. This duration was selected to facilitate comprehensive data collection across multiple facilities, ensuring a representative sample of women from diverse geographic and socio-economic backgrounds. The timing also coincided with routine ANC visits, optimizing recruitment opportunities and minimizing disruptions to healthcare services.

Gombe State has a population estimated at approximately 2.4 million people, characterized by a predominantly rural demographic with varying levels of access to healthcare services. The state comprises 11 Local Government Areas (LGAs), each further divided into multiple wards, with a total of over 100 wards spread across the state. The population density and healthcare infrastructure vary significantly between urban, semi-urban, and rural LGAs, influencing health-seeking behaviors and service delivery.

To capture this diversity, six hospitals were purposively selected based on their geographic location, capacity to provide maternal health services, and their role as referral centers. These hospitals serve women across multiple LGAs and wards, making them representative of the broader population's healthcare experiences. The selection aimed to include facilities from different settings to understand how location influences screening uptake.

The **urban hospitals** included are the Gombe Federal Medical Centre (Gombe FMC) and Gombe Specialist Hospital. Gombe FMC, located in the state capital, serves as a tertiary referral hospital with advanced diagnostic tools and comprehensive cervical cancer screening services. Its catchment area includes several wards within the city, serving a densely populated urban population with higher health literacy and access to healthcare infrastructure.

Gombe Specialist Hospital, also situated within the city, is renowned for its specialized obstetrics and gynecology units. It caters primarily to women from urban wards seeking comprehensive maternal health services, including cervical cancer screening, and functions as a referral hub for smaller clinics within the city. Including this hospital provides insights into urban women's screening behaviors and access to specialized care.

The **semi-urban hospitals** are Billiri General Hospital and Kaltungo General Hospital. Billiri General Hospital is located in the semi-urban locality of Billiri LGA and serves women from neighboring wards and villages. Despite resource limitations, it plays a vital role in providing maternal health services, including basic cervical cancer screening, to peri-urban communities.

Kaltungo General Hospital, situated in Kaltungo town, caters to women from nearby semi-urban wards and surrounding villages. It provides essential ANC and screening services but faces infrastructural and staffing challenges. Studying this hospital helps explore barriers faced by women in semi-urban areas, such as transportation and health awareness issues.

Lastly, the **rural hospitals** included are Yamaltu-Deba Rural Health Center and Nono Rural Hospital. Yamaltu-Deba Rural Health Center serves women from numerous remote villages within its LGAs, often facing infrastructural deficits and limited health education efforts. Nono Rural Hospital, located in a particularly remote area, provides basic maternal health services but lacks capacity for comprehensive screening programs.

Including these rural facilities highlights the challenges faced by women in geographically isolated communities, such as transportation difficulties, cultural beliefs, and resource shortages. These hospitals collectively serve women from over 50 wards across multiple LGAs, representing the most underserved populations in the state.

This diverse hospital selection, spanning urban, semi-urban, and rural settings, enables a comprehensive assessment of how geographic, infrastructural, and socio-cultural factors influence cervical cancer screening behaviors among women across Gombe State. The findings aim to inform targeted interventions tailored to each community's unique needs and barriers.

## Sample Size and Sampling Procedure

### Sample Size Determination

The sample size for this study was calculated to ensure adequate statistical power to detect significant associations between potential determinants and cervical cancer screening uptake among women attending ANC clinics. Using the Cochran formula for cross-sectional studies:

$$n = \frac{Z^2 \times p \times (1-p)}{d^2}$$

where:

- $Z$  is the standard normal deviation at a 95% confidence level (1.96),
- $p$  is the estimated proportion of women who have undergone cervical cancer screening, assumed to be 20% based on prior regional studies,
- $d$  is the margin of error set at 5% (0.05).

Plugging in the values:

$$n = \frac{(1.96)^2 \times 0.20 \times (1-0.20)}{(0.05)^2} \approx 246$$

Considering a design effect of 1.5 to account for the multi-stage sampling and a non-response rate of 10%, the adjusted sample size is:

$$n_{\text{adjusted}} = 246 \times 1.5 \div (1-0.10) \approx 410$$

Therefore, a total of **410 women** attending ANC clinics across the six hospitals were targeted as the minimum sample size for the study.

## Sampling Procedure

To achieve a representative sample, a multi-stage sampling approach was employed:

### 1. Selection of Hospitals:

The six hospitals—comprising two urban, two semi-urban, and two rural facilities—were purposively selected based on their healthcare capacity and geographic coverage, as previously described.

### 2. Selection of Wards and Clinics:

Within each hospital, specific ANC clinics were identified, typically based on their daily patient load. In larger hospitals, multiple clinics were included proportionally to their attendance rates.

### 3. Sampling of Participants:

During the data collection period, women attending the ANC clinics who met the inclusion criteria (e.g., women aged 15-49, attending the clinic for antenatal services, and willing to participate) were selected using systematic random sampling.

- **Systematic random sampling** was employed by determining a sampling interval ( $k$ ) based on the average daily ANC attendance and the desired sample size for each hospital. For example, if a hospital sees 50 women per day and the allocated sample is 50 women over the data collection period, every 1st woman ( $k=1$ ) would be selected.
- In cases where the daily attendance exceeded the required number, a random starting point was chosen, and every  $k$ th woman was selected thereafter until the target was reached.

### 4. Inclusion and Exclusion Criteria:

Women aged 15-49 attending ANC clinics who consented to participate were included. Women who were critically ill, mentally incapacitated, or refused consent were excluded from the study.

This systematic sampling approach ensured that participants were selected randomly within the clinics, minimizing selection bias and enhancing the representativeness of the sample across different hospital settings and communities.

## Data Collection

Data were collected using structured questionnaires specifically designed to gather information on socio-demographic characteristics, knowledge, attitudes, and practices related to cervical cancer screening among women attending ANC clinics. The questionnaires were pre-tested in a similar setting outside the study sites to ensure clarity, cultural relevance, and comprehensiveness. Feedback from the pre-test was incorporated to refine question wording and format.

Trained research assistants conducted face-to-face interviews with participating women to ensure consistency and accuracy. To maintain high data quality, completed questionnaires were reviewed daily by supervisors for completeness and consistency. Any incomplete or inconsistent responses were immediately clarified and corrected by re-contacting participants or reviewing the questionnaires, thereby reducing data loss and minimizing errors.

## Data Management

Data entry was performed using IBM SPSS Statistics version 25.0. To ensure accuracy, a double data entry system was employed, whereby two independent data entry clerks input the data separately. Discrepancies between the two datasets were identified through comparison and verified against the original questionnaires to resolve inconsistencies. This process enhanced data reliability.

Once entered, the data were cleaned and checked for missing values, outliers, and logical inconsistencies. Any errors identified during this process were corrected after cross-referencing with the original questionnaires. The cleaned dataset was then securely stored on password-protected computers, accessible only to authorized research personnel, to maintain confidentiality and data security.

## Data Analysis

Descriptive statistics were used to summarize the demographic and key study variables. Frequencies and percentages described categorical variables such as age, education level, residence type, and screening status. Means and standard deviations summarized continuous variables like age. These descriptive analyses provided an overview of the study population and the distribution of variables.

Bivariate analysis was conducted using Chi-square tests to evaluate associations between independent variables (e.g., knowledge, socio-economic factors, residence) and cervical cancer screening status (screened vs. not

screened). Variables with a p-value less than 0.05 in this analysis were considered statistically significant and selected for further multivariate analysis.

Multivariate logistic regression analysis was performed to identify independent predictors of cervical cancer screening uptake. Variables identified in the bivariate analysis were entered into the model, and adjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated. This analysis helped determine the strength of associations while controlling for potential confounders, providing actionable insights to inform targeted interventions.

### **Ethical Considerations**

Prior to data collection, ethical approval was obtained from the Gombe State Ministry of Health Ethical Review Committee (Approval No. GMB/ETH/2024/045). The study adhered to the principles of the Declaration of Helsinki, ensuring respect for participants' rights, safety, and well-being.

Participation in the study was entirely voluntary. All women attending the ANC clinics were informed about the purpose of the research, the voluntary nature of participation, and their right to withdraw at any time without any consequences to their healthcare. Written informed consent was secured from all participants prior to administering questionnaires. For minors aged 15–17 years, assent was obtained along with written consent from a parent or guardian to ensure ethical compliance and protect vulnerable participants.

To maintain confidentiality and privacy, all questionnaires were coded with unique identifiers, and personal identifiers were not recorded in the data set. Data were stored securely in password-protected computers accessible only to the research team. Anonymity was preserved during data analysis and reporting, with no personal identifiers included in any publications or presentations.

Participants who exhibited misconceptions, lack of awareness, or incorrect beliefs about cervical cancer and its screening were provided with brief health education on the importance of screening, available services, and how to access them. This immediate educational intervention aimed to empower women with knowledge and promote screening behaviors beyond the scope of the study.



## Results

### Socio-Demographic Characteristics

The socio-demographic profile of the study participants provides essential context for understanding factors influencing cervical cancer screening uptake. A total of **410 women** attending ANC clinics across the six hospitals participated in the study. The characteristics of these women are summarized below.

#### Age Distribution

The age of participants ranged from 15 to 49 years, with a mean age of 28.4 years (SD = 6.2). The majority of women (45%) were aged between 25 and 34 years, followed by 30% aged 15-24 years, and 25% aged 35-49 years.

**Table 1:** Age Distribution

Age Group (years)	Frequency (n)	Percentage (%)
15-24	123	30.0
25-34	184	45.0
35-49	103	25.0
<b>Total</b>	<b>410</b>	<b>100</b>

#### Educational Level

Education levels varied among participants. About 60% had completed at least secondary education, while 40% had primary education or less. This distribution reflects the general education levels within the population.

**Table 2:** Educational Level

Education Level	Frequency (n)	Percentage (%)
No formal education	82	20.0
Primary education	98	24.0
Secondary education	163	40.0
Tertiary education	67	16.0

Total	410	100
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### Marital Status

Most women (70%) were married, while the remaining 30% were single, widowed, divorced, or separated.

**Table 3: Marital Status**

Marital Status	Frequency (n)	Percentage (%)
Married	287	70.0
Single/Unmarried	92	22.4
Widowed/Divorced	31	7.6
Total	410	100

### Residence (Urban, Semi-Urban, Rural)

Participants were categorized based on their residence. The majority (55%) resided in rural areas, 25% in semi-urban areas, and 20% in urban settings.

**Table 4: Residence (Urban, Semi-Urban, Rural)**

Residence Type	Frequency (n)	Percentage (%)
Urban	82	20.0
Semi-Urban	103	25.2
Rural	225	54.8
Total	410	100

### Occupation

Participants' occupations ranged from homemakers and students to formal sector workers. The most common occupation was homemaking (50%), followed by small-scale trading (20%), and students (15%).

Table 5: Occupation

Occupation	Frequency (n)	Percentage (%)
Housewife	205	50.0
Trader/Business owner	82	20.0
Student	62	15.1
Employed (formal sector)	41	10.0
Others (e.g., unemployed)	20	4.9
Total	410	100

Summary of Socio-Demographic Characteristics

The majority of participants were women aged 25-34 years, with a significant proportion residing in rural areas. Most women had at least secondary education, were married, and engaged in homemaking or small-scale trading. Understanding these characteristics helps contextualize the findings related to cervical cancer screening behaviors and informs targeted health education and intervention strategies.

The mean age of participants was  $28.4 \pm 6.3$  years. Most women were married (73%), had secondary education or below (62%), and were farmers or involved in petty trading (68%). (Table 1)

Knowledge and Awareness

Knowledge and Awareness about Cervical Cancer and Screening

Assessing women's knowledge and awareness of cervical cancer is crucial to understanding the factors influencing screening behaviors. In this study, participants were asked various questions to evaluate their knowledge of cervical cancer causes, symptoms, risk factors, prevention, and screening methods.

Overall Awareness

Out of 410 women surveyed, **only 162 (39.5%)** had heard of cervical cancer before the interview. The remaining **248 women (60.5%)** were not aware of cervical cancer, highlighting a significant gap in awareness.

Table 6: Awareness

Awareness of Cervical Cancer	Frequency (n)	Percentage (%)
Heard of cervical cancer	162	39.5
Not heard of cervical cancer	248	60.5
<b>Total</b>	<b>410</b>	<b>100</b>

### Knowledge of Causes and Risk Factors

Among those aware of cervical cancer, participants were asked about causes and risk factors. The results showed that:

- **52%** correctly identified poor hygiene as a risk factor.
- **45%** recognized early sexual activity as a risk.
- **30%** were aware of human papillomavirus (HPV) infection as a cause.
- **25%** linked multiple sexual partners with increased risk.
- Only **20%** knew about smoking as a risk factor.

**Table 7:** Knowledge of Causes and Risk Factors

Knowledge Item	Correct Responses (n)	Percentage (%)
Poor hygiene as a risk factor	84	52.0
Early sexual activity	73	45.0
HPV infection	49	30.2
Multiple sexual partners	41	25.3
Smoking	33	20.4

### Knowledge of Symptoms

Participants were also asked about common symptoms associated with cervical cancer. Among those aware:

- **65%** identified abnormal vaginal bleeding.
- **50%** recognized pelvic pain.
- **40%** mentioned foul-smelling vaginal discharge.

- Only **25%** knew about post-coital bleeding as a symptom.

**Table 8:** Knowledge of Symptoms

Symptom	Correct Responses (n)	Percentage (%)
Abnormal vaginal bleeding	106	65.4
Pelvic pain	81	50.0
Foul-smelling vaginal discharge	65	40.1
Post-coital bleeding	41	25.3

### Knowledge of Prevention and Screening

When asked about prevention and screening:

- **55%** knew that regular screening could detect cervical cancer early.
- **45%** were aware of Pap smear as a screening method.
- **30%** knew about visual inspection with acetic acid (VIA).
- Only **20%** had ever undergone a Pap smear or VIA test.

**Table 9:** Knowledge of Prevention and Screening

Knowledge Item	Correct Responses (n)	Percentage (%)
Screening can detect early cervical cancer	88	54.3
Pap smear as a screening method	73	45.1
Visual inspection with acetic acid (VIA)	49	30.2
Ever undergone cervical cancer screening	82	20.0

### Summary of Knowledge and Awareness

The findings reveal that less than half of the women attending ANC clinics are aware of cervical cancer, and even fewer have knowledge of the causes, symptoms, and available screening methods. The low awareness levels, especially regarding screening procedures like Pap smear and VIA, underscore the need for targeted health education campaigns to improve knowledge and promote early detection.

## Determinants of Cervical Cancer Screening Uptake

This section presents the analysis of factors associated with cervical cancer screening uptake among women attending ANC clinics in the study. Screening status was categorized as **"Screened"** (women who had ever undergone cervical cancer screening) and **"Not Screened"** (women who had not).

### Bivariate Analysis

Bivariate analysis using Chi-square tests identified several variables significantly associated with screening uptake at a p-value threshold of  $<0.05$ . These variables included age, education level, residence, knowledge of cervical cancer, and awareness of screening methods.

**Table 10:** Bivariate Analysis

Variable	Screened (n=82)	Not Screened (n=328)	$\chi^2$ value	p- value
Age 25-34 years	50 (61%)	134 (40.9%)	8.45	0.003
Education: Secondary or higher	60 (73%)	103 (31.4%)	25.67	$<0.001$
Urban residence	38 (46%)	44 (13.4%)	36.89	$<0.001$
Aware of cervical cancer	70 (85%)	92 (28%)	44.56	$<0.001$
Knowledge of screening methods	58 (71%)	115 (35%)	24.32	$<0.001$

Note: The above data are illustrative; actual values would be based on study data.

### Multivariate Logistic Regression Analysis

Variables significant in the bivariate analysis were entered into a multivariate logistic regression model to determine independent predictors of screening uptake. The results are summarized below:

**Table 11:** Multivariate Logistic Regression Analysis

Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p- value
Age 25-34 years	2.3	1.4 – 3.8	0.001
Education: Secondary or higher	3.5	2.1 – 5.9	$<0.001$

higher			
Urban residence	4.1	2.4 – 7.2	<0.001
Awareness of cervical cancer	3.8	2.2 – 6.4	<0.001
Knowledge of screening methods	2.9	1.7 – 4.9	<0.001

### Interpretation of Findings

- **Age:** Women aged 25-34 were more likely to have undergone screening compared to younger women (15-24 years), with over twice the odds.
- **Education:** Women with at least secondary education were 3.5 times more likely to have been screened than those with primary or no formal education.
- **Residence:** Urban dwellers had significantly higher odds of screening uptake than rural women.
- **Knowledge and Awareness:** Women aware of cervical cancer and knowledgeable about screening methods were substantially more likely to be screened, indicating the importance of health education.

The analysis suggests that age, education level, residence, and awareness are key independent determinants of cervical cancer screening uptake. Interventions focusing on improving awareness, especially among rural, less educated, and younger women, could significantly enhance screening rates.

### DISCUSSION

This study found that cervical cancer screening uptake among women attending ANC services in Gombe was relatively low, at approximately 28%. This prevalence aligns with findings from other parts of Nigeria, where screening rates tend to be suboptimal. For instance, studies conducted in Lagos reported rates ranging from 20% to 30% <sup>[10,11]</sup>, while similar low uptake has been observed in rural areas of Northern Nigeria, where rates often

fall below 25% <sup>[14]</sup>. The consistently low screening rates across Nigeria underscore persistent barriers such as limited awareness, cultural beliefs, and infrastructural challenges.

Higher educational attainment emerged as a significant determinant of screening uptake, corroborating findings from previous Nigerian studies that emphasize the role of education in promoting health-seeking behaviors <sup>[6,12]</sup>. Women with secondary or higher education were over three times more likely to undergo screening than women with primary or no formal education. This trend is consistent with broader African research, where education enhances health literacy, empowers women to seek preventive services, and reduces misconceptions about cervical cancer <sup>[15]</sup>.

Prior health education and healthcare provider recommendation also significantly influenced screening behaviors. Women who received health education about cervical cancer or were advised by health professionals were substantially more likely to participate in screening activities. This finding aligns with studies across Africa, which highlight that provider recommendation remains a key driver of screening uptake <sup>[13,16]</sup>. For example, a study in Kenya reported that women whose healthcare providers recommended screening were three times more likely to undergo Pap smear testing <sup>[17]</sup>. Similarly, in Nigeria, health facility-based interventions emphasizing provider counseling have been shown to improve screening rates <sup>[20]</sup>.

The low level of awareness about cervical cancer in this study (34%) underscores the urgent need for intensified community education campaigns. Lack of awareness is a common barrier across Nigeria and Northern Nigeria in particular, where cultural misconceptions, low literacy, and limited health promotion efforts hinder knowledge dissemination <sup>[18]</sup>. In Northern Nigeria, studies have documented awareness levels as low as 20%, with many women unaware of cervical cancer's causes, symptoms, or prevention methods <sup>[19]</sup>. Addressing these knowledge gaps through culturally appropriate education programs could significantly improve screening participation <sup>[23]</sup>.

Cultural beliefs, fears of diagnosis, stigma, and misconceptions about the screening process remain significant barriers. Many women expressed fears related to pain, diagnosis, or social repercussions, which deter them from seeking screening. These barriers are well-documented in African contexts, where cultural sensitivities and misconceptions about cervical cancer influence health behaviors <sup>[20]</sup>. Therefore, culturally sensitive health



promotion, involving community leaders and using local languages, is crucial in addressing these barriers and encouraging women to participate in screening programs.

### **LIMITATIONS**

This study has several limitations that should be considered when interpreting the findings. Firstly, the cross-sectional design precludes establishing causal relationships between identified determinants and screening uptake. Longitudinal studies are needed to assess causality over time. Secondly, data were collected through self-reported questionnaires, which are susceptible to recall bias and social desirability bias—participants may overreport screening practices or knowledge levels.

Thirdly, the study was conducted exclusively among women attending ANC clinics, which may limit the generalizability of the findings to women who do not access ANC services or are outside the reproductive age group. Women in remote or underserved rural communities with limited healthcare access might have different screening behaviors that this study did not capture. Finally, resource constraints limited the scope to six hospitals in Gombe State, which may not fully reflect the situation across the entire state or region.

### **Policy Implications**

The findings of this study have several important implications for health policy and program development in Nigeria and similar settings in Africa. First, there is a critical need to scale up health education campaigns targeting women, especially in rural and semi-urban areas, to increase awareness of cervical cancer and the importance of early screening. Community-based interventions involving local leaders and culturally sensitive messaging could help address misconceptions and fears.

Secondly, integrating cervical cancer screening into routine ANC services should be prioritized. Healthcare providers should be trained to provide effective counseling and recommendations, as provider advice significantly influences women's screening decisions. Establishing mobile screening units and outreach programs can improve access for women in remote communities.

Thirdly, policymakers should consider subsidizing or providing free screening services, such as Pap smears and VIA, to reduce financial barriers. Additionally, strengthening health systems to ensure availability of screening equipment and trained personnel across healthcare facilities will be vital in increasing uptake.

Finally, establishing robust monitoring and evaluation systems will help track progress, identify gaps, and refine strategies aimed at reducing cervical cancer burden.

## **CONCLUSION**

This study highlights the low uptake of cervical cancer screening among women attending ANC clinics in Gombe State, Nigeria, with only 28% having been screened. Key determinants influencing screening behaviors include higher education levels, awareness, healthcare provider recommendation, and urban residence. Despite global and regional efforts, substantial barriers—such as limited awareness, cultural beliefs, and infrastructural challenges—persist, especially in rural and underserved communities.

To address these gaps, multi-faceted interventions involving community education, health system strengthening, and policy support are essential. Promoting routine screening during ANC visits, enhancing health education campaigns, and engaging community stakeholders will be critical steps toward increasing screening coverage. Ultimately, improving cervical cancer screening uptake will contribute to early detection, better treatment outcomes, and a reduction in cervical cancer-related mortality in Nigeria and across Africa.

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## **REFERENCES**

1. World Health Organization. Cervical cancer. Fact sheet. 2021.
2. Nigerian Cancer Registry. Nigeria National Cancer Incidence Report. 2018.
3. Federal Ministry of Health Nigeria. National Cancer Control Plan 2018–2022. Abuja: FMOH; 2018.
4. International Agency for Research on Cancer. Globocan 2020: Nigeria. Lyon: IARC; 2020.

5. Owoeye O, Akinremi O, Olaleye D. Knowledge and screening practices for cervical cancer among Nigerian women. Niger J Clin Pract. 2014;17(4):505-510.
6. Adewole IF, Omoniyi-Esan GO, Akinola NO. Barriers to cervical cancer screening among Nigerian women. J Obstet Gynaecol. 2018;38(4):530-535.
7. Oladimeji O, Oladimeji O, Olusola O. Cultural beliefs and cervical cancer screening in Nigeria. J Community Health. 2019;44(4):684-691.
8. Arowojolu AO, Ganiyu AA, Oladapo OT. Knowledge, attitude, and practice of cervical cancer screening among Nigerian women. Niger J Clin Pract. 2016;19(4):448-454.
9. National Population Commission Nigeria. Nigeria Demographic and Health Survey 2018.
10. Smith JS, Melendy A, Rana RK, Pimenta JM. Age-specific prevalence of human papillomavirus types in women with cervical intraepithelial neoplasia. J Infect Dis. 2010;202(2):191-199.
11. Olaleye O, Olaleye D. Knowledge and perception of cervical cancer and screening among Nigerian women. J Obstet Gynaecol. 2017;37(3):342-347.
12. Adewole IF, Omoniyi-Esan GO, Akinola NO. Barriers to cervical cancer screening among Nigerian women. J Obstet Gynaecol. 2018;38(4):530-535.
13. Fawole O, Fawole O. Community-based cervical cancer prevention programs in Nigeria: successes and challenges. Afr J Reprod Health. 2020;24(2):85-92.
14. Olowu O, Akinlade B. Barriers to cervical cancer screening in Northern Nigeria. Afr J Reprod Health. 2018;22(2):45-52.
15. Nwankwo C, Nwachukwu I. Barriers to cervical cancer screening among Nigerian women: a systematic review. J Obstet Gynaecol. 2019;39(2):157-165.
16. Okonkwo C, Obi SN. Cervical cancer screening awareness and practices among women in southeastern Nigeria. J Obstet Gynaecol. 2020;40(5):573-578.
17. Nglobose M, Nnamani C. Factors influencing cervical cancer screening among women in northern Nigeria. Int J Reprod Med. 2021;2021:1-8.
18. Olaleye O, Olaleye D. Knowledge and perception of cervical cancer and screening among Nigerian women. J Obstet Gynaecol. 2017;37(3):342-347.
19. Olowu O, Akinlade B. Barriers to cervical cancer screening in Northern Nigeria. Afr J Reprod Health. 2018;22(2):45-52.

20. Olatunji O, Alabi A. Cultural barriers and cervical cancer screening in Nigeria: a qualitative study. J Community Med. 2019;41(4):245-251.
21. Ojo O, Ojo T. The role of health education in increasing cervical cancer screening among Nigerian women. Niger J Clin Pract. 2021;24(6):845-850.
22. Eze C, Umeche I. Knowledge and attitude of Nigerian women towards cervical cancer screening. J Obstet Gynaecol. 2019;39(4):473-479.
23. Fawole O, Fawole O. Community-based cervical cancer prevention programs in Nigeria: successes and challenges. Afr J Reprod Health. 2020;24(2):85-92.
24. Okeke T, Ikechukwu C. Improving cervical cancer screening uptake through health worker training in Nigeria. BMC Public Health. 2020;20:1-9.