

Research Article

Knowledge of Cervical Cancer Screening Among Women of Reproductive Age Living With HIV in Akamkpa Local Government Area, Cross River State

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Abstract

Cervical cancer is largely preventable, yet women living with HIV remain at substantially increased risk because immunosuppression favours persistent high risk human papillomavirus infection. This study evaluated knowledge of cervical cancer screening among women of reproductive age living with HIV in Akamkpa LGA, Cross River State. A health facility based cross sectional study was conducted among 340 women receiving HIV care in five selected facilities. Data were collected with a structured interviewer administered questionnaire and analysed using IBM SPSS Statistics version 25. Descriptive statistics summarised knowledge, while binary logistic regression examined associated factors. Although 92.4% of respondents had heard of cervical cancer screening, detailed knowledge was uneven. While 83.5% knew that women living with HIV had higher cervical cancer risk, only 58.2% identified vaginal bleeding as a warning sign and 49.1% recognised pain during sexual intercourse. 13.8% incorrectly believed that antiretroviral therapy removed the need for cervical screening, while 22.1% were uncertain. Overall, 64.1% had good knowledge and 35.9% had poor knowledge. Secondary education, tertiary education, monthly income of N70,000 to N100,000, and previous screening experience were significantly associated with good knowledge. Women who had previously screened had more than four times the odds of good knowledge compared with those never screened. The findings show that general awareness does not necessarily provide the specific knowledge required for timely prevention. Cervical cancer counselling should be routinely integrated into HIV care and linked to accessible screening services.

1. Introduction

Cervical cancer develops mainly after persistent infection with oncogenic human papillomavirus. Its progression from infection to precancer and invasive disease usually provides a long period during which screening and treatment can prevent cancer. Despite this opportunity, the burden remains concentrated in countries where organised screening, diagnosis, and treatment are limited. Global evidence has consistently shown that cervical cancer disproportionately affects women in low income and middle income settings [1, 2].

Women living with HIV require particular attention because HIV weakens the immune response to human papillomavirus. A major global analysis found that women living with HIV were about six times more likely to develop cervical cancer than women without HIV [3].

The World Health Organization therefore recommends earlier and more frequent cervical screening for women living with HIV, with primary HPV DNA testing beginning at age 25 and repeated every three to five years where that approach is used [4, 5].

Knowledge is essential to the use of cervical cancer prevention services. It includes more than awareness that cervical cancer exists. Women need accurate information about risk factors, warning signs, prevention, screening methods, recommended timing, service locations, and the continuing need for screening while receiving antiretroviral therapy. A woman may have heard of screening and still believe that it is only required when symptoms develop, that cancer is invariably fatal, or that effective HIV treatment removes her cervical cancer risk. Such misconceptions weaken the value of general awareness.

Research among women living with HIV in Africa has repeatedly identified inadequate knowledge as a barrier to screening. A systematic review and meta analysis reported substantial knowledge deficits across African studies, while another review identified lack of cervical cancer information as the most common barrier among women living with HIV in low income and middle income countries [6, 7]. Studies in Tanzania and Zambia similarly found that knowledge was incomplete even among women receiving regular HIV care [8–10].

In Nigeria, cervical screening is still largely opportunistic, and policy commitments have not produced uniform access across facilities. A systematic review found that limited information, misconceptions, fear, cost, and health service problems continued to reduce screening use [11]. Recent policy analysis also identified implementation and resource gaps within Nigeria's cervical cancer prevention framework [12]. These weaknesses are important for women living with HIV because routine antiretroviral therapy visits should provide repeated opportunities for counselling and screening.

Akamkpa Local Government Area contains urban, semi urban, and rural communities with different levels of access to health information and specialised care. Local evidence was needed to establish whether women receiving HIV services understood their increased risk and the practical requirements for cervical screening. This article therefore focuses on Objective Two of the source study by evaluating the content and level of cervical cancer screening knowledge among women living with HIV in Akamkpa.

Statement of the Problem

Cervical cancer is preventable when women receive appropriate vaccination, screening, and treatment of precancerous lesions. However, prevention depends partly on whether women recognise their risk and understand the action required. This is particularly important for women living with HIV, whose biological risk is elevated but whose routine care may remain focused mainly on antiretroviral treatment.

High awareness can conceal weak practical knowledge. Women may recognise the term cervical cancer screening without knowing its purpose, recommended interval, relationship with HIV, or availability. Nigerian evidence has shown that many women who report awareness cannot identify major risk factors, prevention methods, or treatment possibilities [13]. When knowledge is incomplete, women may delay screening until symptoms occur or assume that stable HIV treatment provides sufficient protection.

Before the source study, there was limited local evidence on these knowledge gaps among women living with HIV in Akamkpa. Without item level information, health programmes could continue delivering broad awareness messages while overlooking the misconceptions most likely to delay screening. The study therefore assessed knowledge of risk factors, warning signs, prevention, treatment, screening timing, and the role of antiretroviral therapy, and examined the characteristics associated with good knowledge.

Aim and Objective

The aim was to evaluate knowledge of cervical cancer screening among women of reproductive age living with HIV in Akamkpa Local Government Area. The specific objective was to determine their knowledge of cervical cancer risk, warning signs, prevention, treatment, screening timing, and screening recommendations.

Research Question

What is the level of knowledge of cervical cancer, its risk factors, warning signs, prevention, treatment, and screening recommendations among women of reproductive age living with HIV in Akamkpa Local Government Area?

2. Literature Review

2.1. Cervical Cancer and HIV Related Risk

Cervical cancer begins in the cells of the cervix and is caused mainly by persistent infection with high risk human papillomavirus. Most HPV infections resolve naturally, but persistent infection can produce precancerous cellular changes. Screening identifies these changes before they progress to invasive disease. The preventable nature of cervical cancer explains why differences in screening access produce large inequalities in incidence and mortality [1].

HIV changes the natural history of HPV infection. Immunosuppression makes persistent infection, recurrent lesions, and progression to cervical disease more likely. The increased risk remains relevant even when a woman is receiving antiretroviral therapy. ART is essential for HIV control, but it does not replace HPV vaccination, cervical screening, or treatment of precancer. Women need this distinction to avoid a false sense of protection [3].

2.2. Cervical cancer screening

Cervical cancer screening is performed among women who may have no symptoms. The principal methods are HPV DNA testing, cervical cytology, and visual inspection with acetic acid. HPV DNA testing detects oncogenic viral types, cytology identifies abnormal cervical cells, and visual inspection permits immediate observation of acetowhite lesions. The appropriate method depends on national guidance, available equipment, trained personnel, laboratory capacity, and referral systems.

WHO guidance prioritises women living with HIV because they face higher risk. It recommends HPV DNA based screening beginning at age 25 and repeated every three to five years for women living with HIV, compared with longer intervals for the general population [4, 5]. Knowledge of this risk based schedule is important because women may otherwise wait for symptoms or assume that the screening schedule for the general population applies to them.

Effective screening knowledge is practical. Women should know that the test is preventive, that it is useful before symptoms appear, where it is provided, what the procedure involves, and what follow up is required. Information should also explain that abnormal results do not automatically mean invasive cancer and that treatment of precancer can prevent progression.

2.3. Knowledge of Cervical Cancer Screening

Knowledge contains several connected domains. Disease knowledge covers HPV, cervical cancer, and warning signs. Risk knowledge concerns factors that increase susceptibility, including HIV. Prevention knowledge includes vaccination, screening, and early treatment. Procedural knowledge addresses the type of test, timing, interval, service location, and follow up. Actionable knowledge is present when a woman can translate these facts into a specific preventive decision.

Awareness questions alone may overestimate meaningful understanding. Dozie et al. [13] found that many women attending antenatal clinics in South Eastern Nigeria had heard of cervical screening, but considerably fewer understood the cause, risk factors, prevention, and treatment of cervical cancer. This distinction is relevant to programme evaluation because a campaign may increase recognition of the term without improving the knowledge required for action.

Women living with HIV should have repeated opportunities to receive information during clinic visits. However, reviews continue to identify poor knowledge as a major barrier, suggesting that contact with an HIV clinic does not automatically ensure adequate cervical cancer counselling [7, 14]. Information must be intentionally integrated into routine care, reinforced over time, and linked to an available service.

Knowledge may influence screening by increasing perceived risk, clarifying the benefits of early detection, reducing fear of the procedure, and strengthening confidence in accessing care. Screening experience may also improve knowledge because women receive counselling during the procedure. The relationship can therefore operate in both directions. Studies among women living with HIV have found positive relationships between knowledge, attitudes, and screening practice [8, 10].

2.4. Socio Demographic and Clinical Influences

Education commonly influences cervical cancer knowledge because it affects literacy, comprehension, exposure to health information, and confidence in communicating with providers. Women with limited schooling may be disadvantaged when counselling relies on technical language or written materials. This makes plain language, local language explanations, illustrations, and teach back methods essential.

Income may affect access to phones, media, transportation, preventive services, and provider consultation. Women who believe screening is unaffordable may also give limited attention to information about it. Clinical contact creates opportunities for counselling, but the value of contact depends on whether cervical cancer prevention is routinely included. Previous screening is especially important because it provides practical information that cannot be gained from general awareness alone.

2.5. Theoretical Framework

Health Belief Model

The Health Belief Model explains preventive behaviour through perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self efficacy [15]. It is suitable for cervical screening because women must assess their risk, the seriousness of cervical cancer, the value of screening, and the practical or emotional costs of the procedure.

For women living with HIV, accurate knowledge should strengthen perceived susceptibility by explaining the connection between HIV, persistent HPV infection, and cervical cancer. Knowledge that screening can identify treatable precancer increases perceived benefit. Clear information about the procedure can reduce fear and embarrassment, while provider recommendation can serve as a cue to action. Practical information about service location, timing, cost, and follow up can strengthen self efficacy.

The model also shows why information alone may be insufficient. A knowledgeable woman may remain unscreened when cost, distance, service unavailability, stigma, or fear is overwhelming. Knowledge interventions should therefore be linked to accessible and respectful services.

Empirical Review

Bogale et al. [6] systematically reviewed knowledge, attitude, and practice of cervical cancer screening among women infected with HIV in Africa. The pooled evidence showed inadequate knowledge and wide variation between settings. The heterogeneity indicated that local service organisation, education, information exposure, and measurement methods strongly influence reported knowledge.

Guillaume et al. [7] reviewed barriers to cervical screening among women living with HIV in low income and middle income countries. Lack of knowledge was the most frequently reported barrier, alongside fear, stigma, financial limitations, and weak health systems. The review concluded that education should be combined with service improvement rather than delivered as an isolated intervention.

Kimondo et al. [8] assessed women living with HIV in northern Tanzania after cervical screening had been integrated into routine HIV care. Knowledge remained inadequate despite generally favourable attitudes. Mrema et al. [9] also found important knowledge gaps among women living with HIV in northern Tanzania and recommended tailored education within HIV services. These studies show that service integration must include deliberate counselling.

Mukosha et al. [10] studied women living with HIV in public facilities in Lusaka, Zambia. Knowledge was positively associated with attitudes and screening practice. This supports the view that knowledge is an important foundation for preventive behaviour, although the difference between knowledge and actual screening shows that structural barriers also matter.

Within Nigeria, [11] found that inadequate information, misconceptions, fear, cost, and health service factors consistently reduced screening use. [16] documented an innovative cervical screening programme across Nigerian ART sites, showing that HIV platforms can be used to provide screening for large numbers of women. [12] nevertheless found continuing gaps in policy implementation and health system resource mapping. The present study adds local evidence by identifying the precise areas of knowledge strength and weakness in Akamkpa.

3. Methodology

3.1. Study Area and Design

The study was conducted in Akamkpa Local Government Area of Cross River State, Nigeria. The area contains urban, semi urban, and rural communities, and many residents depend on farming, fishing, petty trading, and other informal livelihoods. Five facilities providing HIV care were included: General Hospital Akamkpa, Mma Effa Health Centre, Mfamosing Health Centre, Oban Health Centre, and Aningeje Health Centre.

A descriptive health facility based cross sectional design was used to assess cervical cancer screening knowledge among women receiving HIV care.

3.2. Study Population and Sampling

The study population comprised women aged 18 to 49 years who had a confirmed HIV diagnosis, were receiving care in a selected facility, had been on HIV treatment for at least six months, and provided informed consent. Pregnant women and women who were seriously ill were excluded.

Cochran's formula produced an initial sample of 370, which was increased to 407 to allow for nonresponse. A multistage procedure was used. The five HIV treatment facilities were purposively selected, eligible women were identified from ART clinic registers, proportional allocation was applied across facilities, and participants were selected by simple random sampling. A total of 340 complete responses were available for analysis.

3.3. Instrument, Validity, and Reliability

Data were collected through a structured interviewer administered questionnaire and a health record extraction form. The questionnaire covered socio demographic characteristics, HIV related information, screening history, and knowledge of cervical cancer and screening. Trained case managers assisted participants who preferred Pidgin English or local languages, and interviews were conducted privately after routine appointments.

Content and face validity were established through literature review, expert assessment, and a pilot study involving 30 women in a facility outside the selected sample. The knowledge scale produced a Cronbach alpha coefficient of 0.78, indicating acceptable internal consistency.

3.4. Measurement and Data Analysis

Correct responses to the knowledge items received one point, while incorrect and uncertain responses received zero. Respondents who scored at least 7 out of 12 were classified as having good knowledge, while those who scored below 7 were classified as having poor knowledge.

Data were analysed using IBM SPSS Statistics version 25. Frequencies and percentages described item level and overall knowledge. Binary logistic regression produced crude odds ratios, 95% confidence intervals, and p values for factors associated with good knowledge. Statistical significance was set at p less than 0.05.

3.5. Ethical Considerations

Ethical approval and administrative permissions were obtained before data collection. Participation was voluntary and based on informed consent. No personal identifiers were recorded, interviews were private, and data were reported in aggregate form.

4. Results

4.1. Knowledge of Cervical Cancer and Screening

Almost all respondents, 92.4%, had heard of cervical cancer screening. Most knew that multiple sexual partners increased cervical cancer risk and that women living with HIV had higher risk. Knowledge of warning signs was weaker. Only 58.2% recognised vaginal bleeding and 49.1% recognised pain during sexual intercourse as possible symptoms.

Most respondents knew that cervical cancer was preventable, that screening was preventive, and that early detection improved the possibility of treatment. However, only 67.9% recognised vaccination as a preventive measure. The study item on prompt screening after HIV diagnosis was answered correctly by 61.5%. A total of 13.8% incorrectly believed that ART removed the need for cervical screening, while 22.1% were uncertain. Three quarters knew that women should screen every three years even when healthy Table 1.

Table 1: Knowledge of Cervical Cancer and Screening Among Respondents, N = 340

Knowledge item	Correct n (%)	Incorrect n (%)	Uncertain n (%)
Had heard of cervical cancer screening	314 (92.4)	26 (7.6)	Not applicable
Multiple sexual partners increase risk	272 (80.0)	34 (10.0)	34 (10.0)
Women living with HIV have higher risk	284 (83.5)	27 (7.9)	29 (8.6)
Vaginal bleeding is a warning sign	198 (58.2)	78 (22.9)	64 (18.8)
Pain during sexual intercourse is a warning sign	167 (49.1)	102 (30.0)	71 (20.9)
Cervical cancer is preventable	276 (81.2)	34 (10.0)	30 (8.8)
Vaccination can prevent cervical cancer	231 (67.9)	62 (18.2)	47 (13.8)
Screening can prevent cervical cancer	293 (86.2)	28 (8.2)	19 (5.6)
Screening should begin promptly after HIV diagnosis	209 (61.5)	76 (22.3)	55 (16.2)
Early detected cervical cancer can be treated	286 (84.1)	38 (11.2)	16 (4.7)
ART does not remove the need for screening	218 (64.1)	47 (13.8)	75 (22.1)
Women should screen every three years when healthy	255 (75.0)	56 (16.5)	29 (8.5)

Source: Field survey, 2026.

4.2. Overall Knowledge Level

Overall, 218 respondents, representing 64.1%, had good knowledge, while 122 respondents, representing 35.9%, had poor knowledge. The result indicates moderate knowledge, but the item level pattern shows that substantial misconceptions remained Table 2.

Table 2: Overall Knowledge Level, N = 340

Knowledge category	Score	Frequency	Percentage
Good knowledge	At least 7 out of 12	218	64.1
Poor knowledge	Below 7 out of 12	122	35.9
Total		340	100.0

Source: Field survey, 2026.

4.3. Factors Associated With Good Knowledge

Education, monthly income, and previous screening experience were significantly associated with good knowledge. Compared with women who had primary education or less, women with secondary education had 2.52 times the odds of good knowledge, while those with tertiary education had 2.36 times the odds.

Women earning N70,000 to N100,000 monthly had 1.93 times the odds of good knowledge compared with those earning below N70,000. Previous screening showed the strongest association. Women who had ever screened had 4.11 times the odds of good knowledge compared with those never screened. Age, marital status, household size, CD4 count, and duration on ART were not statistically significant Table 3.

Table 3: Significant Factors Associated With Good Knowledge

Comparison	Good knowledge n (%)	Crude odds ratio	95% confidence interval	p value
Primary education or less, reference	60 (50.4)	1.00	Reference	
Secondary education	110 (71.9)	2.52	1.52 to 4.16	less than 0.001
Tertiary education	48 (70.6)	2.36	1.26 to 4.42	0.007
Income below N70,000, reference	119 (58.3)	1.00	Reference	
Income N70,000 to N100,000	62 (72.9)	1.93	1.11 to 3.35	0.020
Never screened, reference	98 (51.0)	1.00	Reference	
Ever screened	120 (81.1)	4.11	2.50 to 6.76	less than 0.001

Source: Field survey, 2026.

5. Discussion

The study identified a clear difference between general awareness and actionable knowledge. More than nine in ten respondents had heard of cervical cancer screening, yet only 64.1% met the threshold for good knowledge. The result is more encouraging than the low knowledge reported in several African studies, but it does not indicate complete understanding. Important gaps remained in warning signs, vaccination, screening timing, and the role of ART.

The high awareness found in Akamkpa may reflect repeated contact with HIV services and broader public health messaging. However, [13] reported a similar pattern in South Eastern Nigeria, where awareness was considerably higher than detailed knowledge of cervical cancer causes, prevention, risk factors, and treatment. Programme monitoring should therefore assess the content of knowledge rather than relying on a single awareness question.

Most women knew that HIV increased cervical cancer risk. This is important because perceived susceptibility is a central construct of the Health Belief Model. Yet fewer respondents answered the study item on prompt screening after HIV diagnosis correctly. This suggests that awareness of increased risk was not always linked to a clear preventive action. Counselling should state the relevant WHO guidance

directly: women living with HIV should begin HPV DNA based screening at age 25 and repeat it every three to five years, depending on the screening approach and national guidance [4, 5].

The ART misconception requires specific attention. More than one third either believed or were uncertain that ART removed the need for cervical screening. ART improves immune function and life expectancy, but women living with HIV continue to have elevated cervical cancer risk. Counselling should therefore present HIV treatment and cervical cancer prevention as complementary rather than interchangeable services.

Knowledge of possible warning signs was weaker than knowledge of general prevention. This may delay diagnostic assessment when symptoms occur. However, symptom education must not imply that screening is symptom driven. The correct message is that regular screening is needed when a woman feels healthy, while abnormal bleeding, persistent discharge, pelvic pain, or pain during sexual intercourse requires prompt clinical evaluation.

The overall knowledge level was higher than the pooled pattern reported by [6], but comparisons should be cautious because studies use different questions and scoring systems. Findings from Tanzania and Zambia also show that women living with HIV can have favourable attitudes or regular clinic attendance while retaining important knowledge gaps [8–10]. This consistency supports structured cervical cancer education within HIV services.

Education was significantly associated with good knowledge. Women with secondary or tertiary education were more than twice as likely to have good knowledge as women with primary education or less. This does not mean that limited schooling is the cause of poor knowledge. It shows that health communication may favour women who can read technical materials or ask questions confidently. Providers should use plain language, local language explanations, pictures, and teach back methods so that understanding is not dependent on formal education.

Monthly income also influenced knowledge. The significant association for women earning N70,000 to N100,000 may reflect better access to media, transportation, consultations, and screening services. It may also show that women facing severe financial pressure pay less attention to a service they expect to be unaffordable. Education should therefore include accurate information about cost and service availability, while programmes should reduce financial barriers through integrated or subsidised screening.

Previous screening experience was the strongest associated factor. Women who had screened had more than four times the odds of good knowledge. The cross sectional design cannot determine whether knowledge led to screening or screening improved knowledge. Both processes are plausible. A screening encounter usually includes an explanation of the procedure and result, while knowledgeable women may be more willing to accept screening. This finding supports combining education and service delivery in the same visit.

Nigerian programme evidence shows that large scale screening can be delivered through ART sites, although quality, treatment completion, and follow up require continued strengthening [16]. In Akamkpa, each HIV clinic visit should become a routine opportunity to assess screening status, provide brief counselling, correct misconceptions, and offer screening or a documented referral. This would convert repeated HIV care contact into comprehensive preventive care.

The absence of significant associations for age, marital status, CD4 count, and duration on ART is also informative. Knowledge gaps were present across demographic and clinical groups. Long engagement in HIV care did not guarantee adequate cervical cancer information. A standard counselling protocol is therefore preferable to assumptions that older women, married women, or long term ART clients already understand screening.

The findings agree with systematic reviews that identify poor knowledge as a major but modifiable barrier [7, 11, 14]. However, knowledge should not be treated as the sole explanation for screening behaviour. Women may understand the benefits and remain unable to screen because of cost, distance, service interruptions, fear, or stigma. Education must be accompanied by reliable supplies, trained providers, privacy, affordable services, and functional referral pathways.

The study was facility based and may not represent women living with HIV who are disengaged from care. Self reported responses may be affected by recall or social desirability. The cross sectional design also prevents causal conclusions about the relationship between screening and knowledge. Nevertheless, the item level findings provide a useful local guide for targeted counselling.

6. Conclusion

Cervical cancer screening knowledge among women living with HIV in Akamkpa was moderate but incomplete. General awareness was high, and most respondents understood that HIV increased risk and that screening and early detection were beneficial. Important gaps remained in warning signs, vaccination, screening timing, and the continuing need for screening while receiving ART.

Education, income, and previous screening experience significantly influenced knowledge. The strong association with previous screening shows the value of linking counselling directly to service delivery. Routine, personalised cervical cancer education within HIV care is needed so that every woman understands her risk, the recommended screening schedule, the role of ART, and the practical steps required to screen.

Recommendations

- Every ART initiation, refill, clinical review, and adherence counselling session should include brief cervical cancer information and documentation of screening status.
- Providers should clearly explain that ART is essential for HIV control but does not replace cervical screening.
- Health education should use plain language, local languages, illustrations, and teach back methods, with additional support for women with limited formal education.
- Facilities should offer same visit screening where possible or provide a clear appointment and referral pathway.
- Screening should be free or subsidised for women receiving HIV care, and information about cost and service availability should be explicit.
- Women who have completed screening can be trained to reinforce accurate messages and reduce fear within HIV support groups.
- Programme indicators should assess risk, screening timing, ART misconceptions, and service location rather than awareness alone.
- Longitudinal and qualitative studies should examine how counselling, screening experience, and service barriers influence knowledge and behaviour over time.

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Data Availability: Data available on reasonable request

Disclaimer (Artificial Intelligence): The author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.), and text-to-image generators have been used during writing or editing of manuscripts.

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