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Original Research

Awareness of cervical cancer prevention among rural dwellers in Enugu State, Nigeria: findings from Ituku outreach

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Abstract

Introduction: WHO's global target of eliminating cervical cancer is just 5 years away, and women living in low-resource settings like Nigeria may be left behind, because a significant proportion may not be aware of cervical cancer and its preventive measures. Thus, there is an urgent need to review and possibly scale up awareness of cervical cancer prevention among women residing in rural communities in Nigeria through free medical outreach programs. The aim of this study was to assess the level of awareness and perceptions of cervical cancer prevention among participants of a community health outreach program in Ituku, Enugu State, Nigeria.
Methods: This mixed-methods study was a quantitative survey of 352 participants and qualitative interviews of 10 purposively selected women attendees at the 2024 free medical outreach at the community of Ituku, Awgu local government area, Enugu State. A pre-tested and validated questionnaire was used to collect data from participants. Quantitative data analysis was done using the Statistical Package for the Social Sciences, while thematic analysis was done for qualitative components.
Results: Out of 525 eligible women who attended the health outreach, 352 (67.0%) were recruited into the study. Awareness of cervical cancer was reported by 27.8% (*n*=98) of respondents, while 27.3% (*n*=96) were aware of cervical cancer screening methods. Only 9.1% (*n*=32) had heard of HPV vaccination as a preventive measure, and 4.5% (*n*=16) were aware that HPV infection is a causative factor for cervical cancer. Only 4.5% (*n*=16) of respondents had ever undergone cervical cancer screening. Awareness of screening methods was associated with age of 40 years or less and being Roman Catholic, while willingness to vaccinate children was associated with having formal education.
Conclusion: In a rural community in Enugu State, Nigeria, only 3 out of every 10 women were aware of cervical cancer and its preventive measures. Although 1 in every 10 knew that HPV vaccination prevents against cervical cancer, over 9 of 10 of them were willing to vaccinate their children. To join the global community in eliminating cervical cancer by 2030, there is an urgent need to intensify awareness campaigns through outreach programs targeting rural dwellers in low- and middle-income countries about cervical cancer, its etiology and prevention.

Keywords

cancer aetiology, cancer awareness, cervical cancer, HPV vaccine, vaccination willingness.

Introduction

Cervical cancer remains a significant public health issue in Nigeria, particularly in rural areas, where access to information and medical services is limited. It is one of the leading causes of cancer-related deaths in women globally, especially in low- and middle-income countries. Each year, nearly 350,000 women die from cervical cancer, which is one death every two minutes[1]. In Nigeria, this imposes a considerable financial burden, as well as psychological and emotional stress on affected families, communities and the country at large[2].

Cervical cancer is often described as a preventable cancer[3]. This is because its primary cause, persistent infection with high-risk strains of HPV, is preventable through vaccination[2]. Furthermore, the disease typically progresses slowly, offering a window of opportunity for timely detection and treatment of premalignant lesions[3,4].

However, evidence suggests that many rural dwellers are not aware of preventive measures such as HPV vaccination and screening for precancerous changes[5,6]. This lack of awareness in rural Nigeria[5] is considered a major barrier to the success of the global cervical cancer elimination initiative, which aims to achieve its targets by 2030[7].

If a critical population, such as rural dwellers, is unaware that cervical cancer is preventable through HPV vaccination, it is unlikely that Nigeria will achieve the goal of vaccinating 90% of girls aged 9–14 years[7]. Similarly, it is anticipated that 70% of women would be screened by age 35 years using high-performance tests like HPV testing, but lack of knowledge about screening may make it an unrealistic hope[6]. Additionally, without awareness of the early signs and symptoms of cervical cancer such as postcoital bleeding, copious foul-smelling vaginal discharge and postmenopausal bleeding, it would be nearly impossible for 90% of affected women to access timely and appropriate treatment[7].

The knowledge gap about cervical cancer prevention among rural residents may stem from several factors, including limited access to print and electronic media (such as television and radio), lack of mobile phones or internet connectivity, and low literacy levels[8]. These barriers highlight the need for health interventions such as targeted medical outreach programs designed to bridge the information gap. Such programs can increase awareness and uptake of cervical cancer prevention strategies, thereby reducing mortality and supporting Nigeria's contribution to the global goal of eliminating cervical cancer.

To eliminate cervical cancer as a public health threat, WHO has set a global strategy that includes achieving the 90–70–90 targets by 2030: 90% of girls fully vaccinated against HPV by age 15 years, 70% of women screened by age 35 years and again by 45 years, and 90% of women identified with cervical disease receiving appropriate treatment[7]. Achieving these targets requires increased awareness of cervical cancer – particularly its causes, preventive measures such as screening, and the availability of HPV vaccination. In Nigeria, this need is especially critical in rural populations, which often face disproportionately limited access to health education and preventive services[9].

Therefore, evaluating awareness and perceptions of cervical cancer etiology and prevention during the Ituku town health outreach could help identify effective strategies for health education and outreach in similar rural communities. This approach would strengthen Nigeria's efforts toward aligning with WHO's cervical cancer elimination goals by 2030.

Methods

Study design

This mixed-methods study comprised cross-sectional quantitative surveys and qualitative interviews of the women at the 2024 Ituku free medical outreach program.

Study area

Ituku is a rural community in the Awgu local government area of Enugu State, Nigeria[10]. It is one of the host communities of the University of Nigeria Teaching Hospital, Ituku-Ozalla. The town is located approximately 21 km from Enugu City, along the Enugu–Port Harcourt Expressway. Geographically, Ituku lies at latitude 6°17′25″ N and longitude 7°27′15″ E, with a land area of about 2000 hectares[10].

The population of Ituku is estimated at about 5000 residents. The majority were born in Ituku, with a smaller proportion comprising immigrant settlers, particularly staff of the University of Nigeria Teaching Hospital. The community is predominantly agrarian, with most residents engaged in farming, while a minority work as civil servants. Women constitute an estimated 60% of the population.

Study population

The study population comprised adult inhabitants of Ituku town including women and men aged 18 years or more who attended the Ituku free medical outreach program. The outreach was a day program organized by Ituku medical practitioners and the Society of Obstetricians and Gynaecologists of Nigeria, Enugu branch. The free medical outreach was approved by the Enugu State Ministry of Health and attended by approximately 700 men, women and children. They were seen by a consultant gynecologist, gynaecology resident doctors, consultant ophthalmologists and GPs.

Sampling

For the cross-sectional arm of the study, convenience sampling of eligible health outreach attendees was utilized. A total sample size of 352 respondents was used for the study. The minimum required sample size was calculated using the Kish formula for prevalence studies: $n = Z^2 \times P \times (1 - P)/d^2$[11].

Using a prevalence (P) of cervical cancer awareness in a rural community in the state of Lagos of 15%[12], 5% margin of error (d), Z being 1.96 at 95% confidence level, a minimum sample size of 234 after adding 20% non-response rate was obtained. A sample population of 352 was used to increase the study power.

Inclusion criteria

The study eligibility criteria included sexually active women aged 25–65 years, with no history of cervical cancer diagnosis or total hysterectomy. Ten women who were aware of cervical cancer screening methods were purposively selected and interviewed.

Exclusion criteria

Men and children were excluded from the study, as well as women who had resided in Ituku for less than 6 months prior to the health outreach.

Data collection

Prior to data collection, written permission was obtained from Enugu State Ministry of Health, and all eligible participants signed a consent form.

A face-validated and structured interviewer-administered questionnaire assessing knowledge about cervical cancer prevention was used for data collection. An in-depth interview to gain insights into perceived barriers to cervical cancer screening was carried out on selected participants who were aware of cervical cancer. After the questionnaires were administered to the participants by the corresponding author and the obstetrics and gynecology resident doctors (research assistants), we reviewed and identified the 98 who were aware of cervical cancer. With their numbers in the attendance register, a random selection (balloting) was done to select 10 out of the 98 to have the in-depth interview. The selected women answered an extra question: what are the perceived barriers to screening for cervical cancer? This was administered by us on one-by-one basis.

Participants who had ever heard of cervical cancer were considered to be aware of the disease, while those who had heard of any screening method were considered to be aware of cervical cancer screening.

Data analysis

Quantitative analysis was done using the Statistical Package for the Social Sciences v20.0 for Windows (IBM Corp; https://www.ibm.com/products/spss-statistics). Analysis was essentially descriptive, with basic characteristics being illustrated as frequencies and percentages, and presented in tables and figures. Thematic analysis was conducted to identify patterns and key themes from participants' responses regarding perceived barriers to cervical cancer screening. The analysis followed the six-step framework outlined by Braun and Clarke[13].

Ethics approval

Ethics approval was obtained from the Health Research Ethics Committee (HREC) of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State; NHREC/05/01/2008B-FWA00002458-1RB00002323.

Results

Of the 525 eligible women who attended the health outreach, 352 (67.0%) were enrolled in the cross-sectional component of the study, with a response rate of 97%. Additionally, 10 women participated in the in-depth interview component. The mean age of respondents was 51±12.6 years while those aged 40 years or more constituted 70% of the population. All respondents were Christians, with a majority (72.7%) being Roman Catholics. In terms of occupation of the participants, many (59.1%) were farmers, with pockets of other occupations. Regarding educational status, 109 (30.9%) respondents had primary education while 38 (10.9%) had tertiary education. Details of the basic sociodemographic characteristics, obstetric and gynecological features of the respondents are as shown in Table 1.

Table 2 shows that only 98 (27.8%) of the respondents were aware of cervical cancer while 16 (4.5%) knew there was an etiological link between persistent HPV infection and cervical cancer. A total of 96 (27.2%) were aware of screening methods. Also, 32 (9.1%) knew that HPV vaccine prevented against cervical cancer. Only 15 (4.0%) of the respondents had ever had cervical cancer screening.

When we explored the association between basic characteristics such as age and educational status, and some variables such as awareness of cervical cancer, awareness of screening methods, awareness of HPV vaccine and respondents' willingness to vaccinate their daughters, the result showed age was significantly associated with awareness of cervical cancer screening ($p<0.0001$),

HPV vaccination ($p<0.0001$) and respondents' willingness to vaccinate their daughters against HPV infection ($p<0.0001$). Having formal education was also significantly associated with respondents' willingness to vaccinate their daughters ($p<0.0001$). Further details of the relationship between these factors can be seen in Table 3.

Among the 96 respondents who were aware of cervical cancer screening, 77 (80.2%) were aware of the Pap smear. Awareness of other screening methods was as follows: 10 respondents (10.4%) were aware of visual inspection with acetic acid, 14 (14.6%) of visual inspection with Lugol's iodine, 2 (2.1%) of HPV testing, and only 1 respondent (1.0%) was aware of colposcopy.

Additionally, when the willingness of the respondents to vaccinate their daughters against HPV infection was assessed, the study showed that almost all 319 (90.6%) of the respondents were willing. When the 33 (9.4%) who were not willing were asked the reason, 63.6% said it may cause sterility (infertility) in their daughters, 18.1% said they were afraid of the side effects, 12.1% said they did not know much about the vaccine while the remaining 6.2% did have any reason.

During the in-depth interviews, which were conducted by the corresponding author, participants were asked, 'What are the perceived barriers to screening for cervical cancer?' The following key barriers emerged from their responses: lack of awareness that screening methods exist, limited access to screening services, the perception that screening may be unaffordable, concerns about pain or discomfort associated with the procedure, and fear of receiving a cancer diagnosis. These themes are summarized in Table 4, with illustrative quotes from participants.

Table 1: Sociodemographic characteristics of study participants (*N*=352)

Characteristic	Variables	*n*	%
Age (years) (mean 51±12.6 years)	<20	0	0.0
	20–40	96	27.3
	>40	256	72.7
Christianity	Yes	352	100.0
	No	0	0.0
Church denomination	Roman Catholic	256	72.7
	Anglican	32	9.1
	Pentecostal	64	18.2
Occupation	Farming	208	59.1
	Teaching (primary and secondary)	112	31.8
	Civil servants	16	4.5
	Petty traders	16	4.5
Level of education	No formal education	99	28.1
	Primary	109	30.9
	Secondary	106	30.1
	Tertiary	38	10.9
Parity (number of births)	0	38	10.8
	1	10	2.9
	2–4	80	22.7
	>4	224	63.6
Menstrual status	Menstruating	202	57.4
	Postmenopausal	150	42.6
BMI (kg/m^2)	<18.5	4	1.2
	18.5–24.9	60	17.0
	25–29.9	265	75.3
	≥30	23	6.5

Table 2: Awareness of cervical cancer and preventive measures (*N*=352)

Characteristic	Variables	*n*	%
Awareness of cervical cancer	Yes	98	27.8
	No	254	72.2
Aware that persistent HPV infection causes cervical cancer	Yes	16	4.5
	No	336	95.5
Awareness of screening methods	Yes	96	27.2
	No	256	72.2
Aware that HPV vaccine prevents cervical cancer	Yes	32	9.1
	No	320	90.9
Ever screened for cervical cancer	Yes	15	4.0
	No	337	96.0

Table 3: Associations of respondent's characteristics with cervical cancer prevention and awareness

Characteristic	Variables	Respondent awareness/willingness		*p*-value	Odds ratio	95%CI
		Yes	No			
		n (%)	*n* (%)			
Cervical cancer awareness						
Age (years)	>40	62 (63.3)	194 (76.4)	0.08	1.60	0.87–2.94
	≤40	36 (36.7)	60 (23.6)			
Educational status	Any formal education	68 (69.4)	185 (72.8)	0.30	0.85	0.51–1.41
	No formal education	30 (30.6)	69 (27.2)			
Roman Catholic?	Yes	74 (75.5)	182 (71.7)	0.54	1.23	0.65–2.28
	No	24 (24.5)	72 (28.3)			
Awareness of any cervical cancer screening method						
Age (years)	>40	27 (28.1)	229 (89.5)	<0.0001	0.05	0.03–0.08
	≤40	69 (71.9)	27 (10.5)			
Educational status	Any formal education	65 (67.7)	188 (73.4)	0.18	0.76	0.46–1.26
	No formal education	31 (32.3)	68 (26.6)			
Roman Catholic?	Yes	59 (60.2)	197 (77.0)	0.03	0.52	0.29–0.95
	No	37 (39.8)	59 (23.0)			
Awareness of HPV vaccine for cervical cancer prevention						
Age (years)	>40	16 (50.0)	256 (80.0)	<0.0001	0.25	0.12–0.53
	≤40	16 (50.0)	64 (20.0)			
Educational status	Any formal education	26 (81.3)	227 (70.9)	0.15	1.78	0.71–4.45
	No formal education	6 (18.7)	93 (29.1)			
Roman Catholic?	Yes	19 (59.4)	237 (74.1)	0.03	0.51	0.28–0.93
	No	13 (40.6)	83 (25.9)			
Willingness to vaccinate children						
Age (years)	>40	238 (74.6)	18 (54.5)	<0.0001	0.25	0.12–0.53
	≤40	81 (25.4)	15 (45.5)			
Educational status	Any formal education	245 (76.8)	8 (24.4)	<0.0001	10.3	5.34–19.7
	No formal education	74 (23.2)	25 (75.6)			
Roman Catholic?	Yes	249 (78.1)	7 (21.2)	<0.0001	13.3	6.76–26.0
	No	70 (21.9)	26 (78.8)			

CI, confidence interval

Table 4: Perceived barriers to cervical cancer screening among participants

Emerging theme	Illustrative participant quote
Lack of awareness	'Before today, I didn't even know there's a test to check for cervical cancer, not to mention that it can be cured if caught early.'
Limited access to screening	'All these things are sounding strange to most of us, such service is not in Ituku health center.'
Perceived unaffordability	'I think one of the problem[s] is that we think it may be high cost.'
Fear of pain or discomfort	' ... hmmm me, I am afraid of it oh, is that thing not even painful ... '
Fear of diagnosis	' ... what do they want to see, hmm, I don't want them to just find out I have cancer, so that I will start worrying about it every day ... '

Discussion

This study, conducted among women in a rural community in Enugu State, Nigeria, found low levels of awareness about cervical cancer and its screening methods, and identified key barriers to screening uptake within the community. The present study shows that only 27.8% of participants were aware of cervical cancer. This level of awareness is low, particularly when compared to other low- and middle-income countries such as rural South India, where 67% of women were reportedly aware of the disease[14]. The difference in the rate of awareness between rural South India and Ituku may stem from the differences in the demographic and socioeconomic status of the two populations. In Ituku, despite the predominance of rural farmers who were older, had high parity, low levels of education, predominantly Christian and had limited access to reproductive health information[15], these characteristics were not associated with cervical cancer awareness.

The findings align with studies in rural Zimbabwe and parts of Southwest Nigeria like Lagos, which have reported cervical cancer awareness levels of 25% and 27.7%, respectively[12,15]. However, awareness in Ituku was still considerably higher than the 6.2% reported in rural Benin Republic[15] and 12.8% in urban slums of Lagos[16]. These disparities may be attributed to differences in literacy rates, media exposure and community outreach activities in the various settings. For example, communities with more frequent use of electronic media and mobile health campaigns often report higher levels of awareness[17,18]. Although being Roman Catholic was not significantly associated with awareness of cervical cancer in this study, religion has been reported as an impediment, especially to screening[19]. It has also been speculated that religious leaders have strong influence over their followers, which can significantly impact attitudes toward health messages, including those related to the etiology and prevention of cervical cancer. Furthermore, faith communities frequently organize medical outreaches, which can serve as platforms for cervical

cancer awareness creation[20]. Contrary to this, all participants in this study were Christians, yet the level of awareness was very low. Perhaps this low awareness may stem from either a lack of such outreaches or misinformation by religious leaders.

One of the most alarming findings from the study is that only 4% of women reported having ever been screened for cervical cancer. This falls drastically short of WHO's 70% target and even the Nigerian National Strategic Plan's more modest goal of screening 50% of eligible women at least once in their lifetime by 2027[7,21]. The low screening uptake seen here mirrors the national trend. Previous studies show generally poor screening rates across Nigeria, with uptake often below 10%, particularly in rural and underserved regions[18].

The 4% reported in Ituku is especially low and represents a critical gap in the cervical cancer prevention and control program. If such trends persist, Nigeria risks missing not only global goals but also its own national targets[7,21]. The data underscore the urgent need for innovative, cost-effective and community-integrated strategies to improve screening uptake in rural and hard-to-reach areas[22].

This is particularly pressing considering that screening remains one of the most effective ways to detect cervical lesions early, allowing for timely treatment and greatly reducing mortality. Without improved screening efforts, rural communities will continue to face disproportionately high rates of late-stage diagnosis and cervical cancer-related deaths.

The disproportionate awareness of screening methods, with Pap smear being the most commonly known, may be due to its longer history of use, occasional mentions in antenatal and reproductive health clinics and the fact that age less than 40 years was significantly associated with level of awareness of screening methods in this study. However, the almost negligible awareness of HPV testing and colposcopy is troubling, considering these are central to modern cervical cancer screening algorithms[23]. The low awareness of visual inspection with acetic acid and visual inspection with Lugol's iodine, which are cost-effective and recommended by WHO for low-resource settings, suggests missed opportunities in deploying scalable screening solutions in communities like Ituku. These methods are recommended by WHO for low-resource settings due to their simplicity, affordability and effectiveness in detecting precancerous lesions[24]. Perhaps, even more worrying is the very low awareness of HPV testing, which is now regarded as the most sensitive screening method globally[23]. HPV testing allows for self-sampling, which can address barriers such as embarrassment and discomfort often associated with clinician-collected samples[25]. Low awareness of this among rural Nigerian women suggests a missed opportunity to modernize and scale up cervical cancer screening in a way that fits the realities of rural healthcare delivery.

Participants who identified as Roman Catholic had significantly lower odds (75% reduction) of being aware of cervical cancer screening methods compared with non-Catholics. Given that Roman Catholics constituted over 70% of the study population, this finding warrants further investigation. It is unclear whether this association reflects differences in exposure to health information, church-based outreach activities, or other sociocultural factors.

This knowledge gap contrasts starkly with practices in high-income countries, where women are more familiar with and routinely undergo HPV testing[26]. For Nigeria to achieve meaningful progress, there is a need to popularize HPV testing and make it accessible through primary healthcare centers, especially in rural communities.

The study also identified multiple barriers to cervical cancer screening, which include lack of awareness, limited access to screening services, perceived high cost of screening, fear of pain or discomfort and fear of receiving a cancer diagnosis. These barriers are consistent with a study conducted in Nigeria[27]. In rural settings, logistical challenges such as transportation, service availability and out-of-pocket costs can deter women from seeking preventive care. Cultural and emotional factors, particularly fear of cancer diagnosis, may also play a role, as many perceive a cancer diagnosis as a death sentence due to poor access to treatment facilities[27].

Interestingly, when participants were asked about HPV vaccination for their children, 90.6% expressed willingness to vaccinate. Although such high willingness has been expressed by women in Nigeria[28,29], our study showed that it was associated with attaining formal education and age more than 40 years. It also shows a remarkably high level of acceptability and offers a promising opportunity to expand vaccine coverage among adolescents, which is a key pillar in the global cervical cancer elimination strategy.

Among the small proportion who were unwilling to vaccinate their children, 63.6% cited fear of infertility as the main reason. This concern is deeply rooted in a lack of formal education, as well as misinformation and cultural beliefs that tie a woman's value to her ability to bear children. Fertility-related myths have been documented as barriers to vaccine uptake in many parts of Africa[30]. These findings indicate the importance of culturally sensitive education campaigns, involving trusted community and religious leaders to dispel myths and reinforce accurate health information.

Overall, the low awareness rate found in this study reflects limited knowledge about the disease's causes and prevention methods. It underscores the urgent need for intensified, community-focused awareness campaigns that are tailored to the sociocultural and educational context of rural Nigerian women. Such community interventions should be an effective and innovative strategy, as demonstrated by some studies in Africa[31,32].

We hope that future researchers can leverage the findings of this study and focus on innovative and culturally sensitive approaches, peer-group education, home visitation or outreach programs tailored for hard-to-reach communities. Emphatically, we recommend more research to understand the reason why being Roman Catholic is associated with low awareness of cervical cancer prevention in Christian-dominated rural communities in Nigeria.

Despite the positive findings of this study it must be carefully interpreted, considering the inherent limitations in questionnaire-based studies. For instance, participants may have had some recall bias, social desirability bias and misinterpretation of questions. Despite this, the qualitative component of the study enabled us to explore the participants' perceived barriers to screening, hence giving some credence to internal validity of the study.

Conclusion

The findings from this study in the rural community of Ituku paint a stark but clear picture of the current realities surrounding cervical cancer prevention in rural Nigeria. While awareness and uptake of screening remain critically low, there is a promising level of willingness to adopt preventive practices such as HPV vaccination. The study emphasizes the need for multifaceted, community-based strategies that address not just service delivery gaps but also deep-rooted sociocultural barriers.

Achieving WHO's target of cervical cancer elimination in Nigeria will require bold, sustained and inclusive public health interventions. Rural communities like Ituku must not be left behind. Instead, they should be placed at the heart of these efforts, ensuring that no woman, regardless of where she lives, is denied the right to cervical cancer prevention and care.

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Conflicts of interest

The authors declare no conflicts of interest.

AI disclosure statement

The authors used ChatGPT-5 to revise article content. The authors have verified the accuracy of, and take responsibility for, the content.

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