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Knowledge and Awareness of Cervical Cancer and Screening Methods Among Women in the Northern Regional Hospital, Tamale

Authors: Ana Maria Simono Charadan[1]; Linda Akungila[2]; Sasha Hernandez[3].

[1]School of Medicine of the University for Development Studies. Tamale Teaching Hospital. Obstetrics and Gynaecology Department. Northern Region, Tamale. Ghana.

[2]School of Medicine of the University for Development Studies. Northern Region, Tamale.

[3]Department of Obstetrics & Gynaecology. Section for Global Health, Department of Population Health, NYU Grossman School of Medicine. NYU. USA. Corresponding Author:

Ana Maria Simono Charadan

Consultant in Obstetrics and Gynaecology and Senior Lecturer of the School of Medicine at the University for Development Studies. Tamale. Northern Region of Ghana

Address: Zagyuri Hse No: 41/42. Tamale, NR. Ghana

+233240809414

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Abstract

Cervical cancer is the fourth most common cancer in women globally. In 2022, the WHO reported an estimated 660,000 new cases and 350,000 deaths, mostly in developing countries. The Africa Health Organization estimates it accounts for over 22% of female cancers in the region, while in Ghana prevalence is 18.3 per 100,000 women. This study evaluated knowledge and awareness of cervical cancer and its screening methods among women attending the Northern Regional Hospital, Tamale. A descriptive cross-sectional design was employed involving 333 women aged 18–49 years, selected through convenience and simple random sampling. Data were collected using a structured, validated questionnaire. Only 18.5% of participants knew that human papillomavirus (HPV) is the cause of cervical cancer. The most commonly identified symptoms were intermenstrual bleeding (93.9%) and dyspareunia (67.7%). Recognized risk factors included having a partner with multiple sexual partners (71.3%) and persistent HPV infection (62.9%). Although 40.2% of women recognized the Pap smear as a screening test, 86.8% had never undergone screening. Key barriers were lack of awareness (89.2%), perceived cost (59.2%), fear of results, limited access, and concerns about stigma from positive outcomes. The findings underscore critical knowledge and awareness gaps contributing to low screening uptake. Strengthening education, expanding access, and addressing misconceptions are essential to improve cervical cancer prevention. Collaboration between healthcare providers, policymakers, and partners such as AMPATH and the Ghana Health Service has already contributed to raising awareness, but more comprehensive interventions are needed to reduce cervical cancer incidence and mortality in Ghana.

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Keywords: screening methods, precancerous lesions, acetic acid, via, Cervical cancer, Awareness

Introduction

Background of the study

Cervical cancer is preventable and curable, as long as it is detected early and managed effectively. Yet it is the fourth most common form of cancer among women worldwide, according to WHO (2025)1, an estimated six hundred and sixty thousand (660,000) new cases of cervical cancer and three-hundred and fifty (350,000) deaths were reported in the year 2022. Interestingly, most of these cases and deaths are reported in developing countries (Africa Health Organisation, 2025)2. Besides, the Africa Health Organisation (2025) indicated that in the region, it is the commonest female cancer, accounting for more than one-fifth (22.0%) of all female cancers2. In Ghana, the crude prevalence of cervical cancer was 18.3 per 100,000 women (WHO, 2020). A report by WHO (2025)1 on Ghana cervical cancer profile, revealed that 2,200 women died of cervical cancer in 2020.

Countries are increasingly implementing HPV DNA testing following recommendations from the World Health Organization. This new method, particularly the option for self-collection, offers greater choice for women living with HIV. Despite this advancement, visual inspection using acetic acid remains the primary screening method in many regions, largely due to the need for further investments and systems to support widespread HPV DNA testing. Additionally, thermal ablation has gained popularity as a cost-effective treatment option, allowing for the decentralization of services and improving access to care1.

The high incidence and mortality from a largely preventable cancer is a consequence of the limited access to Human papillomavirus (HPV) vaccination, routine cervical cancer screening and treatment of cervical precancerous lesions3-5, and the impact of human immunodeficiency virus (HIV)6 in these settings

The WHO's triple-intervention strategy to achieve elimination rests on three pillars progress towards the 90–70–90 targets for cervical cancer elimination (that 90% of girls are fully vaccinated with the HPV vaccine by the age of 15, 70% of women are screened using a high performance test by the age of 35, and again by the age of 45, and 90% of women with precancer are treated and 90% of women with invasive cancer managed) vary by geographic setting and access to prevention tools1, Thus, all levels of prevention, ranging from primary to tertiary are needed in eradicating cervical cancer7

A report by the World Health Organization in 2024 has indicated that almost 99 percent of cases of cervical cancer is attributed to HPV8 The disease is commoner among persons endulging in unprotected vaginal, anal, and oral sexual intercourse9. The risk factors of cervical cancer are early sexual debut, multiple sexual partners, high consult sexual partner and prolonged use of

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oral contraceptives10. Other risk factors include smoking, low screening uptake, Human immunodeficiency virus (HIV) infection, multiparity and persistent HPV infection with serotypes 16 and 1811.

The staggering new cases and mortalities associated with cervical cancer are largely due to the low level of awareness of screening services12. Besides, the low level of uptake of cervical cancer screening of 4.3 percent in Ghana is due to low level of awareness of screening services13. In this respect, the study aimed to assess the level of knowledge and awareness of cervical cancer and its screening methods among women from the Northern Regional Hospital, Tamale, Northern Region of Ghana

Problem Statement

Last year, June 2024, the Northern Regional Hospital established a fully functional cervical cancer screening centre Northern Regional Hospital, 2025. Prior to the establishment of the centre, women were not screened at the facility. Women who presented with symptoms and signs of cervical cancer were referred to Tamale Teaching Hospital14 The available evidence suggests that the majority of the women referred to the Tamale Teaching Hospital presented at advanced stages of the disease after symptoms had developed144

The screening centre has screened a total number of five hundred and eighty-nine women primarily during outreach programmes, sadly, 80 of these women tested positive using the visual inspection with acetic acid (VIA), however, there is no report indicating the number of cervical cancer cases and the stages of presentation at the center.

Furthermore, the staff at the newly established centre have made great efforts in awareness creation. According to a report, the centre has carried out four community outreach programmes in and outside Tamale township. The communities where the team carried the programmes were Lamashegu, Mion, Youth Fong and Wa14. Despite these efforts, there is no studies to assess the level of awareness and knowledge of the women on cervical cancer screening services. Therefore, this study sought to assess the level of knowledge and awareness of cervical cancer and its screening methods among women who visited the Northern Regional Hospital, Tamale, Northern Region of Ghana.

Hypothesis Statement

- Low awareness is a major barrier contributing to the low uptake of cervical cancer screening among women.

Despite the availability of screening methods such as Pap smears, VIA (visual inspection with acetic acid), and HPV testing, utilization remains suboptimal in many low- and middle-income countries, including Ghana. Existing evidence suggests that women's awareness and understanding of cervical cancer significantly influence their willingness and ability to

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participate in screening programs. Therefore, it is expected that inadequate knowledge about cervical cancer risk factors, symptoms, and preventive measures contributes to the underutilization of screening services. By testing this hypothesis, the study seeks to generate evidence that can inform health education interventions, awareness campaigns, and policies aimed at improving screening uptake and reducing cervical cancer morbidity and mortality.

Research questions

1. What is the level of knowledge of women who visited the Northern Regional Hospital about the symptoms and risk factors of cervical cancer?
2. What is the level of awareness of women who visited the Northern Regional Hospital on cancer screening services?
3. What factors prevent women who have visited the Northern Regional Hospital from using cervical cancer screening services?

Objectives of the Study

Main objective

To assess the level of knowledge and awareness of cervical cancer and its screening methods among women from the Northern Regional Hospital, Tamale.

Specific objectives

1. To determine the sociodemographic characteristics of women who visited the Northern Regional Hospital, Tamale.
2. To assess the level of knowledge on symptoms and risk factors of cervical cancer among women who visited the Northern Regional Hospital, Tamale.
3. To assess the level of awareness of cervical cancer screening services among women who visited the Northern Regional Hospital, Tamale.
4. To determine the barriers to cervical cancer screening among women who visited the Northern Regional Hospital, Tamale.

Significance of the study

This study will contribute to the improvement of cervical cancer screening in the Northern Region of Ghana. The findings will inform the development of effective cervical cancer prevention programmes. The study will also contribute to the existing body of knowledge on cervical cancer prevention and inform health policy decisions. The findings of this study will serve as a health promotional tool in educating women in order take control of their health.

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Scope of the Study

The study used women between 18 and 49 years who visited the Northern Regional Hospital for healthcare services. Women who were diagnosed with cervical cancer, younger than 18 years and older than 49 years were not used for the study.

Organisation of the Study

This study had six chapters. The background and problem were introduced in chapter one. The relevant literature was reviewed in Chapter Two. The methodology used in the study was described in Chapter Three. The findings of the study are presented in Chapter Four. Chapter Five discussed the findings of the study. Chapter Six drew a conclusion and made recommendations based on the findings of the study.

Literature Review

Cervical Cancer and Cervical Cancer Screening

Across the world, cervical cancer is the fourth most common malignancy in women15, the disease contributes immensely to a greater proportion of cancer deaths among women globally and in developing countries16. In Ghana, it is the second most common cause of female cancers17. Women in Africa present with symptoms and signs of cervical cancer at advanced stages18. It is believed that most of the cervical cancer-related deaths and cases diagnosed with cervical cancer could be halved if women are encouraged to undergo cervical cancer screening19.

Similarly, it is reiterated that cervical cancer screening is very necessary for early diagnosis, treatment and reduction in cases of cervical cancer20. Al-Oseely et al. (2023)21 also indicated that screening aids in early detection of cancerous lesions, increasing the probability of cure and having a better prognosis. Besides, premalignant cervical lesions that are detected early and treated promptly offer the best protection against cancer. The Papanicolaou (Pap) smear, the HPV DNA test, visual inspection of the cervix with acetic acid (VIA), and colposcopy are all techniques of cervical cancer screening21.

Knowledge on Cervical Cancer

In India, Masood et al. (2024)22 found that a little over three-quarters (77.5%) of the respondents had heard of cervical cancer. A study in Ethiopia, although few of the women knew about cervical cancer by virtue of its symptoms, most of them did not know cervical cancer by its name and had never heard about HPV as its cause23, also indicated that the respondents lacked knowledge on the risk factors, mode of transmission, prevention, vaccination, screening, or treatment of cervical cancer. A study in Ghana revealed that 52.0% of the respondents did not know that cervical cancer is a sexually transmitted infection; an inter-sectoral approach is needed to increase the level of knowledge, leading to an increase in uptake of cervical cancer screening15.

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In another study in the Central Region of Ghana17, it was reported that 61.3% of their respondents did not know of the organ affected by cervical cancer. In Kenya, 55% of the respondents knew about the disease 24. In addition, in Bangladesh, a study conducted by Nazrul et al. (2024)25 revealed that as few as 20 respondents knew that the causative agent of cervical cancer was HPV, and also stated that though most of the women were conversant with the name cervical cancer, they did not know that non-adherence to screening services predisposes one to the condition. A similar study revealed that only 34.8 percent of the population were aware of HPV infection associated with cervical cancer, while 25.0 percent were familiar with HPV vaccination26.

A study conducted in Saudi Arabia, Tobaiqi et al. (2024)27 found that 59.4 of the women had heard about HPV, 37.0 percent knew that HPV infection is sexually transmitted, and 37.4 percent knew that HPV causes cervical cancer. Social media and the internet were the primary sources of information on cervical cancer and HPV27

In Ethiopia, only 50.7 percent had knowledge of cervical cancer, 27.9 percent of the respondents could identify vaginal bleeding as a symptom of cervical cancer28. Sousa et al. (2024)29 also stated that although most of the respondents in Cabo Verde (94.6%) had heard about cervical cancer, most (86.2%) had a low level of knowledge about this disease. In a different study in Ethiopia, they found that more than three quarters (78.1%) of the respondents had heard about cervical cancer, and the commonest sources of information about cervical cancer were mass media (54.3%), health personnel (18.0%), partners (4.9 %) and newspapers (0.8%)30.

Another study in Ethiopia revealed that 70 percent had heard about cervical cancer, and the most common source of information was social media (35.2%). Interestingly, 38 percent knew that the main cause of cervical cancer was HPV31. A study in Tanzania, reported that though 83 percent of the respondents affirmed that they knew about cervical cancer, 82 percent did not know the cause of cervical cancer, only 9 percent mentioned HPV infection as the viral infection linked to cervical cancer and 57.3 percent never heard about the HPV vaccine, Furthermore, they stated that 66 percent of the respondents did not know any warning signs, whereas 47 cited regular medical checkup as a preventive measure against cervical cancer32.

In a study in Cape Coast, a Ghanaian town, Diallo et al. (2023)33 indicated that only 35 percent of the women interviewed were aware of cervical cancer, the respondents who were of cervical cancer, 63.0 percent of them knew it could lead to a terminal illness, 52.0 percent knew cervical cancer is caused by an infective agent and 64.8 percent knew about the existence of preventive methods. The study affirmed that of the 22.8 percent of the respondents who knew about the existence of preventive methods against cervical cancer, the pap smear was the most commonly known (85.7%), while only a few of them (20.0%) knew about the existence of HPV vaccines33.

Demas et al. (2024)34reported that in Ethiopia, 64.9 percent of women in their study had heard about cervical cancer, with the media being the primary source of information (63.7%).

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According to the studyt35.5 percent of those had heard about cervical cancer rightly indicated that the disease that affects only women, Besides, 47.7 percent of them knew the risk factors for cervical cancer, with most of them citing multiple sexual partners (37.7%), family history (27.9%), and beginning sexual intercourse before the age of 17 years (26,2%). Also, the study indicated that 36.3 percent of the respondents did not know any symptoms of cervical cancer, while 30.9 percent of them mentioned vaginal discharge as a symptom of cervical cancer.
Other significant findings were the belief that cervical cancer is preventable by early screening (73.3%), mentioning early HPV vaccination (23.9%), 34

Awareness of Cervical Cancer Screening Methods

Sampson et al. (2021)17 indicated that in Ghana, 36 percent of the women opined that the Pap smear test is done once. According to Eshete (2021)19, in Ethiopia, only 2.1 percent of the women were aware of cervical cancer screening services. The study found that knowledge on cervical cancer, multiparity, and perceived severity of cervical cancer were associated with increased use of cervical cancer screening services..According to Ngari et al. (2021) 24, 45 percent of the women were aware of when to seek screening, while 40 percent knew the interval between screening services.

Yosef et al. (2024)28 also found that in Ethiopia, only 39.5 percent were aware of cervical cancer screening services; they indicated that public media (55.2%) was the primary source of information. Still in Ethiopia, Tesfaw et al. (2022)30 revealed that only 20.3 percent of the respondents knew about cervical cancer screening. Another study in Ethiopia by Gelassa and Nagari (2023)31 revealed that more than half (53.5%) of the respondents had good level of knowledge about cervical cancer screening. In Nigeria, a study conducted by Maitanmi et al. (2023)35 revealed that more than two-thirds (68.4%) of the respondents were aware of cervical cancer screening. According to Maitanmi et al. (2023), 35, while 47.5 per cent had a favourable attitude towards cervical cancer screening, 76.2 per cent were ready to undergo the screening if a healthcare professional performed the procedure, and 66.1 per cent indicated that they would recommend the screening test to their family members.

In a study in Cape Coast, Diallo et al. (2023)33 reported that of the respondents who knew that cervical cancer can be prevented, 85.7 percent knew that a pap smear is a screening method of cervical cancer. In Addis Ababa, according to Demas et al. (2024)34,20.7 percent of the respondents knew of cervical cancer screening tests, with most of them citing Pap smear (37.7%), VIA and VILI procedures (34.0%). The researchers also mentioned that 38.3 percent of the respondents knew of cervical cancer screening centers 34-36

Barriers to Cervical Cancer Screening

A study in Ghana done by Nyaaba et al. (2023)15 indicated that factors that impeded the uptake of cervical cancer screening services were fear of being misdiagnosed (83.9%), and fear of losing their partners should they be diagnosed with cervical cancer (68.6%). According to the study

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91.1 percent of the women indicated that their religion or cultural practices did not prevent them from partaking in cervical cancer screening. The study highlighted that a significant barrier to utilizing the services was the perception of high costs, with 20.5% of participants citing this concern. Additionally, 15.7% felt that the services were time-consuming, which further deterred them from seeking assistance. In a similar study in Ghana, they stated that 57.1 percent of the women did not use cervical cancer screening services because of the perception that the test was expensive17. Other barriers to the use of cervical cancer screening services were no perceived susceptibility (65.8%), fear of the outcome of the test (48.8%), and believed that the disease cannot be cured and hence unnecessary (46.7%)17.

In South Africa, according to Mathivha et al. (2023)20, barriers to cervical cancer screening were no perceived risk or being healthy (31%), feeling embarrassed (30%) and fear of positive results (15%). Ngari et al. (2021)24 revealed that in Kenya, reasons for failure to seek cervical cancer screening were the belief that screening was not helpful, the procedure being uncomfortable, painful, the procedure leading to low self-esteem, unavailability of screening services, high cost of services, fear of wrong results and the diagnosis of cancer. Additionally, in Vietnam, a study by Phaiphichit et al. (2022)36 stated that the barriers to screening were the absence of clinical features (45.3%) and never having heard about cervical cancer (13.3%).

Furthermore, in a study in Ethiopia by Jemal et al. (2023)37, barriers to low screening were a lack of health educational materials, limitation of service to a specific area, service interruption, provider incompetency, and mistrust and lack of attention by a trained provider. A study using Saudi women by Alfareh et al. (2024)38 showed that the primary reasons for failure to undergo cervical cancer screening were lack of knowledge regarding its importance (40.2%), and lack of information from their healthcare providers (17.0%). Besides, a study among Indian women by Kulkarni et al. (2025)39 also reported that the identified barriers to screening were lack of confidence in persons performing self-test, fear that the test would be painful and anxiety about test results.

A study in Ghana revealed that barriers to cervical cancer screening the tests being burdensome, time-consuming, and capital intensive, also stated that other reasons for failure for use of screening services were sexual inactiveness following the screening, fear of discomfort, and the screening results40. Besides, another study in Ghana by Abubakari et al. (2025)41 reported that poor knowledge, and lower perceived benefits of cervical cancer screening were identified as barriers to cervical cancer screening. Moreover, in a study among Jordanian women, Al-amro et al.(2020)42 found that the barriers to the uptake of screening services were lack of encouragement from the healthcare provider, few number of years of marriage, and use of the public healthcare sector.

In Ethiopia, according to Ziyad et al. (2024)43, the commonly cited reasons for not using cervical cancer screening were being busy and lack of time for screening (18.2%), feeling healthy (16.4%), lack of information (13.6%), being afraid of the test (12.3%), shyness (10.9%),

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and fear of positive result (11.8%). Additionally, in Shanghai, a study by Shao et al. (2024)44 found that being married and lack of sexual activity were associated with low cervical cancer screening. Still in Ethiopia, Tesfaw et al. (2022) revealed that only 14.1 percent of the women were screened for cervical cancer at least once. According to Tesfaw et al. (2022)30, reasons for not having cervical cancer screening were having no health education programmes to promote screening (20.3%), being afraid that a screening test would reveal cervical cancer positive results (37.9%) and belief that the cost of the screening was expensive (27.7%).

In a study conducted in Romania, Covaliu et al. (2025)45 found that personal beliefs about cancer prevention, health misconceptions, perceived costs, and stigma emerged as significant contributors to cervical cancer screening participation. A study in Bhpall, India, found only 5 percent of the respondents had undergone Pap smear screening during their lifetime46. The identified factors associated with low utilization of screening services were lack of awareness (25.1%), lack of adequate health care facilities (22.7%), lack of symptoms (11.7%), not feeling at risk (11.9%) and social stigma (9.6%)46

Methodology

Study Area

The study was conducted at the Northern Regional Hospital. The hospital, also known as the Tamale Central Hospital is located Teshigu, Tamale. The hospital has a bed complement of 141. It is a secondary hospital. The hospital provides specialize medical, surgical, gynaecological, obstetric, child health, mental health services and public health services. The hospital is also a training center for all cadres of health professionals. An operational cervical cancer screening center was established in partnership with Ampath Ghana in June 2024. In all, a total of 589 women had undergone screening since the inauguration of the center (Northern Regional Hospital, 2025).

Study Design

A descriptive cross-sectional study was conducted. A quantitative approach using a structured questionnaire was used. This design was chosen to provide a point-in-time description of the level of knowledge and awareness of women who visited the Northern Regional Hospital on cervical cancer and its screening methods.

Study Population

Women between 18 and 49 years, who visited the Northern Regional Hospital, Tamale, were used for the study. Women who came to the screening center, the general outpatient department, the obstetrics and gynaecology department and the female wards were used. All women who were diagnosed with cervical cancer, or were younger than 18 years and older than 49 years were excluded from the study.

Sample Size Determination

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According to Statistics from the Records Unit of the Northern Regional Hospital (2025), the monthly female outpatient attendance (N) is 3,886. The sample size was calculated using the Yamane formula:
n=N/(1+N*e^2) i

Where is=required isample isize; ie=margin iof ierror=5%=0.05 i
n=3886/(1+3886*〖0.05〗^2) i
n=3886/(1+3886*〖0.05〗^2) i
n=3886/(1+9.715) i
n=3886/10,715 i
n=333 i

A sample size of 333 respondents was used for the study using the Yamane formula. The formula was chosen because the proportion, that is, the level of awareness and knowledge, was not available in the study area. The formula, therefore, provided a sample that is representative of the study area.

Sampling Techniques

A convenience and simple random sampling methods were used in selecting the respondents. Women who visited the hospital for healthcare services, who gave their consent, were randomly selected using computer-generated numbers.

Data Collection Instrument

A structured questionnaire was designed by the researcher and fine-tuned by the supervisor. The questionnaire had four sections. The first section was named Section A, contained closed-item questions on socio-demographic characteristics of the respondents. Section B, contained questions that assessed the knowledge of the respondents on cervical cancer. Section C assessed respondents' awareness on cervical cancer screening methods. The final Section D asked questions to determine the barriers to cervical cancer screening among women who visited the Northern Regional Hospital, Tamale.

Pre-Testing

A pretesting was done prior to actual data collection. The pre-testing was done on 20 women at the Northern Regional Hospital. The results were not included in the final analysis. After the pretesting, minimal changes were made to the questions in terms of wording and sentence structure.

Validity and Reliability

To ensure validity, the questionnaire was fine-tuned by the research supervisor and pretested. Some minimal changes were made to ensure that the instrument measures what it purports to

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ensure (Polit & Beck, 2001). These processes also invariably enhanced reliability of the questionnaire.

Data Collection Procedure

The questionnaire was then captured in a Google Form to ensure easy administration and data collection. The researcher interviewed respondents from 2nd May to 12th June, 2025. The respondents were interviewed between 9:00 am and 12:00 noon during the period. The data were collected from Monday to Saturday. Each respondent was interviewed after they had given their consent. Each interview took about six (6) minutes. Questions were read in English. With an assistant who was trained and persons who understood Dagbani only, appropriate translation was done in the local language.

Data Analysis

The data was saved in Excel from Google and exported to the Statistical Package for Social Sciences (SPSS) version 27.0 for windows. The data was cleaned and reconciled before data analysis. The socio-demographic characteristics were presented on pie charts, bar graphs and in tables. The SPSS software was chosen because it is user friendly.

Ethical Consideration

The study team obtained ethical clearance from the Health Directorate of Northern Regional Hospital, which approved its use for data collection. Before starting data collection, informed consent was obtained from the respondents, and the information was treated confidentially.

Results

Socio-Demographic Characteristics of Respondents

Age distribution

The age distribution of the respondents is presented on the bar charts in Figure 1. Findings showed that the modal class age of the distribution was between 26 and 30 years (46.5%, n=155). The other age classes were those between 22 and 25 years (29.1%, n=97), 18 and 21 years (8.7%, n=29), 31 and 35 years (8.7%, n=29). The least were those who were older than 35 years (6.9%, n=23). The mean age was 27.4 years.

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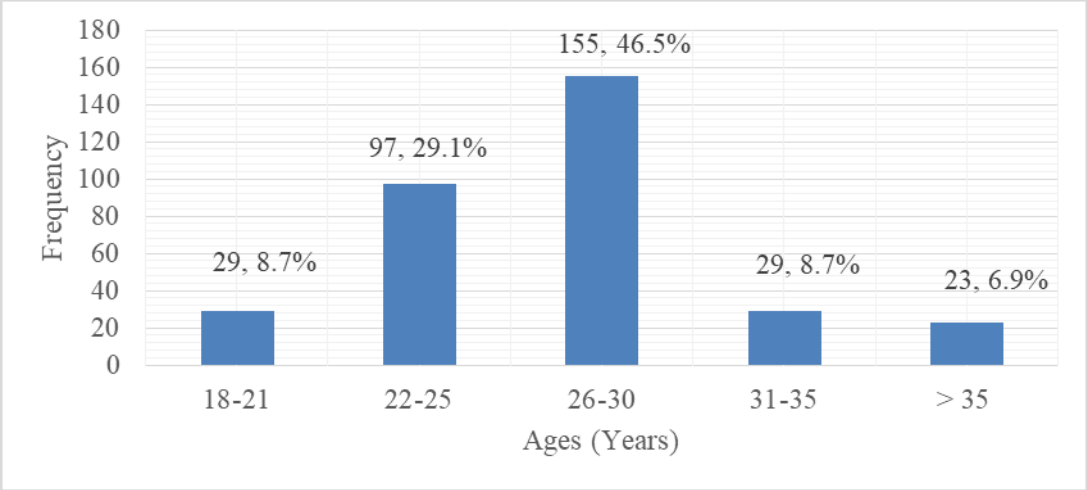
Age Distribution of Respondents

Figure 1



Source: Field Data (2025)

Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics is shown in Table 1. The findings revealed that 70.3 percent (n=234) were Muslims and the rest 29.3%, (n=99) Christians. The Dagombas accounted for about three-fourths (74.8%) of the respondents. Besides, 93.2 percent (n=310) had some of formal education, while 6.8 percent (n=23) had no formal education. In terms of marital status, 61.0 percent (n=203) of the respondents were married, 30.6 percent were single (n=102) and 8.2 percent were co-habiting. With regards to occupation of the respondents, as high as 22.2 percent (n=67) were unemployed, 23.8 percent (n=79) were students, 1.2 percent (n=12) were pensioners. A little over half (52.8%, n=175) were employed.

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Table 1: Socio-demographics of respondents

Socio-demographics	Frequency (N=333)	Percent (%)
Religious affiliations		
Islam	234	70.3
Christianity	99	29.7
Ethnicity		
Dagomba	249	74.8
Akan	37	11.1
Ga-Dangme	14	4.2
Ewe	11	3.3
Others	22	6.6
Highest educational level		
No formal	23	6.8
Primary	23	6.8
JHS	38	11.6
SHS/TVET	131	39.4
Tertiary	117	35.3
Marital status		
Married	203	61.0
Single	102	30.6
Co-habiting	28	8.4
Occupation		
Employed	175	52.8
Unemployed	67	22.2
Student	79	23.8
Retired	12	1.2

Source: Field Data (2025)

Number of Children of Respondents

The parity of the respondents is illustrated on **Figure 2**. Two hundred and three (203) respondents representing 61.0 percent had one or two children, 5.1 percent (n=17) had three or four children, 6.0 percent (n=20) had at least five children and 27.9 percent (n=93) had no children.

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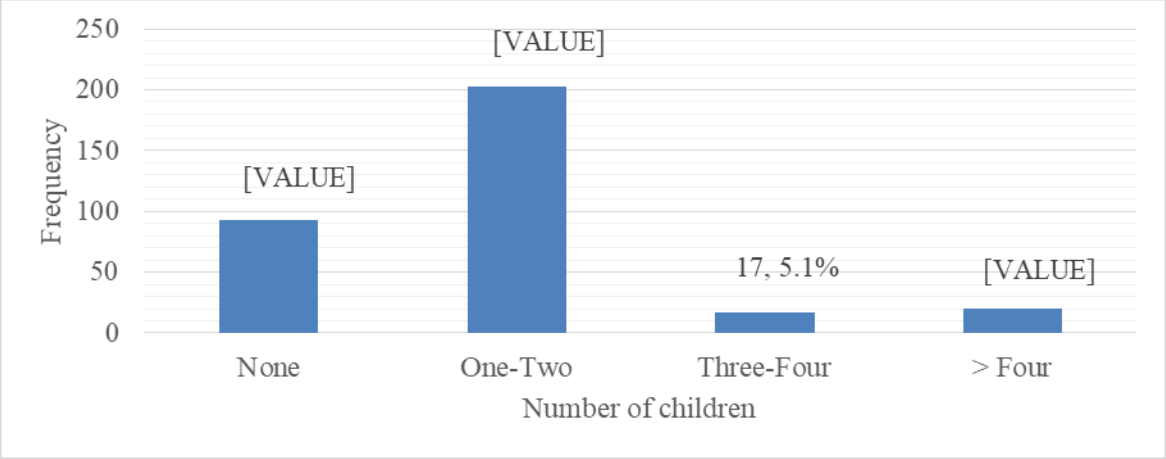
Figure 1: Number of Children

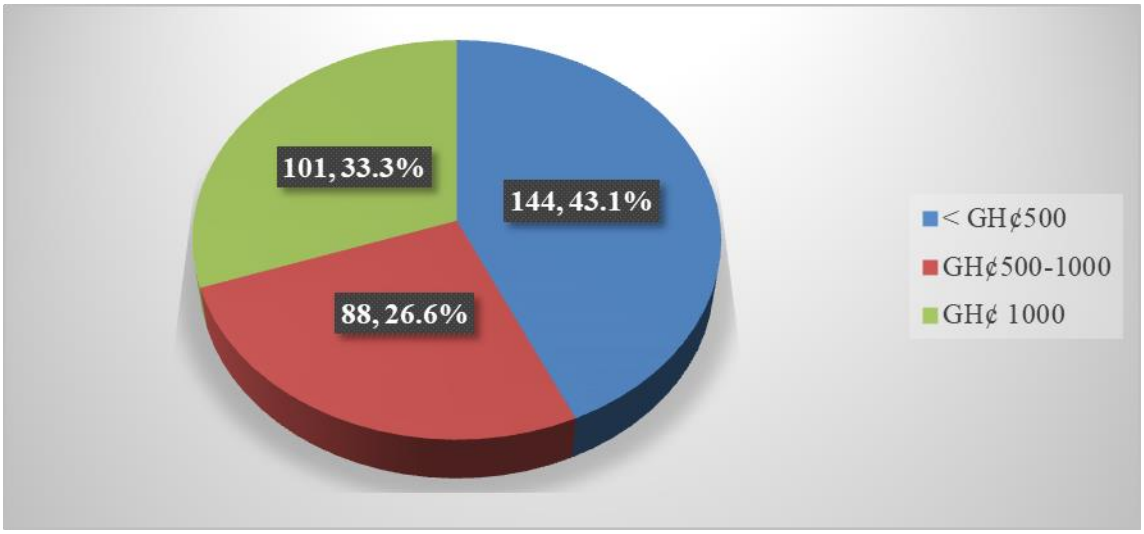


Source: Field Data (2025)

The basic estimated monthly income of the respondents

From **Figure 3** as shown 43.1 percent (n=101) earned less than GH¢500.00 per month. Meanwhile, 26.6 percent (n=88) earned between GH¢500.00 and GH¢1000.00. Besides, 33.3 percent (n=101) earned more than GH¢1000.00.

Figure 2: Basic Monthly Income of Respondents



Source: Field Data (2025)

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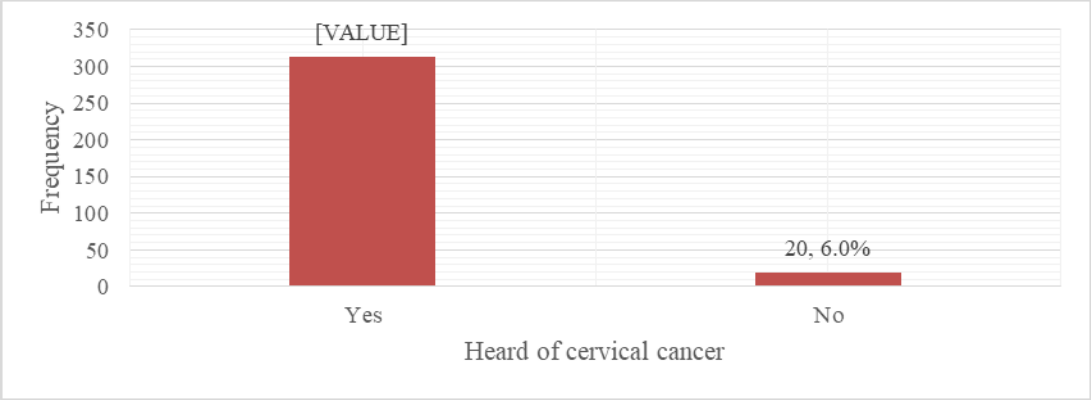
Knowledge on Cervical Cancer

The **Figure 4** shows that as high as 94.0 percent (n=313) had ever heard of cervical cancer. In contrast, 9.0 percent (n=20) had never of cervical cancer.

Figure 3: Respondents Heard of Cervical Cancer

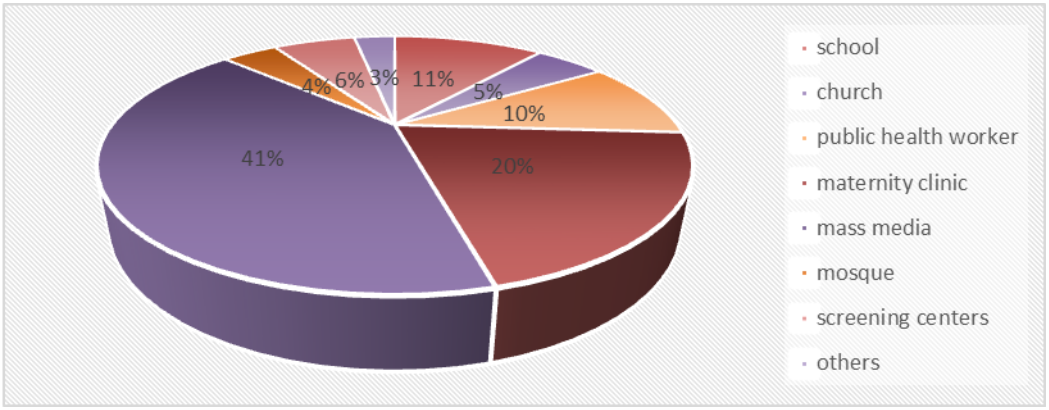


Source: Field Data (2025)

Knowledge on Cervical Cancer

The sources of information on cervical cancer, as shown in **Figure 5,** were mass media (41.0%), maternity clinic (20.0%), school (11.0%), public health worker (10.0%), screening centers (6.0%), Church (6.0%), and Mosque (4.0%).

Figure 4: Sources of Information



Source: Field Data (2025)

Knowledge on Cervical Cancer Causes and Symptoms

Knowledge of the respondents on causes and symptoms of cervical cancer is presented in **Table 2**. Out of the 313 respondents who affirmed having heard of cervical cancer, 54.3 percent

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(n=170) knew that it is cancer of the cervix. On the causative organism, only 18.5 percent (n=58) knew that it was caused by HPV infection.

The respondents identified multiple symptoms of cervical cancer, hence the sum added to more than 100.0 percent. The cited symptoms of cervical cancer are intermenstrual bleeding (93.9%, n=294), postmenopausal bleeding (91.1%, n=285), menorrhagia (68.1%, n=213), dyspareunia (67.7%, n=212), persistent foul vaginal discharge (62.6%, n=196), post-coital bleeding (32.9%, n=103), persistent pelvic pain (31.0%, n=97), persistent low back pain (21.4%, n=67), unexplained weight loss (9.3%, n=29) and blood in urine or stool (7.0%, n=22).

Table 1: Knowledge of Causes and Symptoms of Cervical Cancer

Responses	Frequency (N=313)	Percent (%)
Organ affected		
Uterus	20	6.4
Cervix	170	54.3
Vagina	21	6.7
Do not know	102	32.6
Causative organism		
Bacteria	22	7.0
Virus	57	18.2
Do not know	234	74.8
HPV causes cervical cancer		
Yes	58	18.5
No	36	11.5
Do not know	219	70.0
Symptoms		
Intermenstrual bleeding	294	93.9
Persistent low back pain	67	21.4
Persistent foul vaginal discharge	196	62.6
Discomfort or pain during sex	212	67.7
Heavier and longer menstrual flow	213	68.1
Persistent diarrhoea	103	32.9
Vaginal bleeding after menopause	285	91.1
Persistent pelvic pain	97	31.0
Bleeding during or after sexual intercourse	103	32.9
Blood in urine or stool	22	7.0
Unexplained weight loss	29	9.3

Source: Field Data (2025)

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Knowledge of Risk Factors of Cervical Cancer

The identified risk factors of cervical cancer as displayed in **Table 3** are infection with having a sexual partner with multiple sexual partners (71.3%, n=213), long term use of oral contraceptive (67.7%, n=212), having multiple sexual partners (64.9%, n=203), HPV infection (62.9%, n=197), early sexual debut before age 17 years (62.9%, n=197), immunosuppression (60.7%, n=190), positive family history of cervical cancer (27.2%, n=85) and cigarette smoking (21.4%, n=67).

Table 2: Knowledge of Risk Factors of Cervical Cancer

Risk factors	Agreed	Neutral	Disagreed
Infection with HPV	197 (62.9%)	16 (5.1%)	100 (32,0%)
Cigarette smoking	67 (21.4%)	192 (61.3%)	54 (17.3%)
Immunosuppression	190 (60.7%)	38 (12.1%)	85 (27.2%)
Long-term use of the contraceptive pill	212 (67.7%)	46 (14.8%)	55 (17.6%)
Chlamydia infection	101(32.3%)	173 (55.3%)	39 (12.5%)
Sex with an uncircumcised partner	80 (25.6%)	215 (68.7%)	13 (4.2%)
Early sexual debut before age 17 years	197 (62.9%)	27 (8.6%)	89 (27.5%)
Multiple sexual partners	203 (64.9%)	51 (16.3%)	59 (18.8%)
High consult partner	223 (71.3%)	69 (22.0%)	21 (6.7%)
Not going for regular Pap smear	33 (10.5%)	215 (68.7%)	65 (20.8%)
Alcoholism	31 (9.9%)	183 (58.5%)	99 (31.6%)
Family history of cervical cancer	85 (27.2%)	129 (41.2%)	99 (31.6%)

Source: Field Data (2025)

Awareness of Cervical Cancer Screening Methods

The Figure 6 reveals that only 31.0 percent (n=97) of the respondents had heard of cervical cancer screening methods or tests. However, most of them (69.0%, n=203 had not heard of cervical cancer screening methods or tests.

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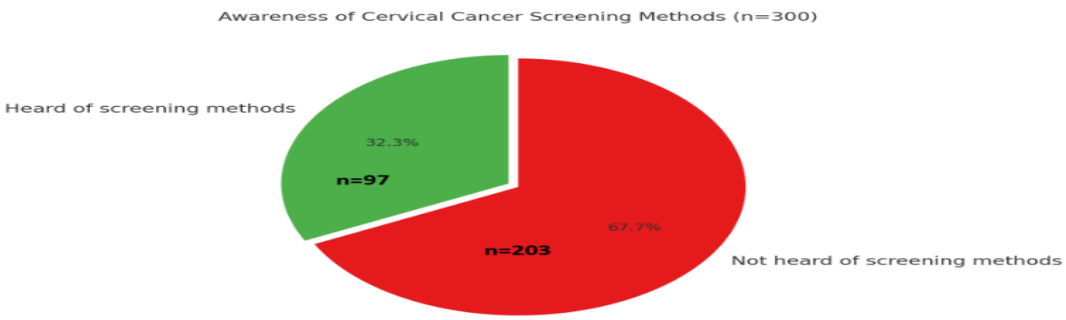
Figure 5: Heard of Cervical Cancer Screening Methods

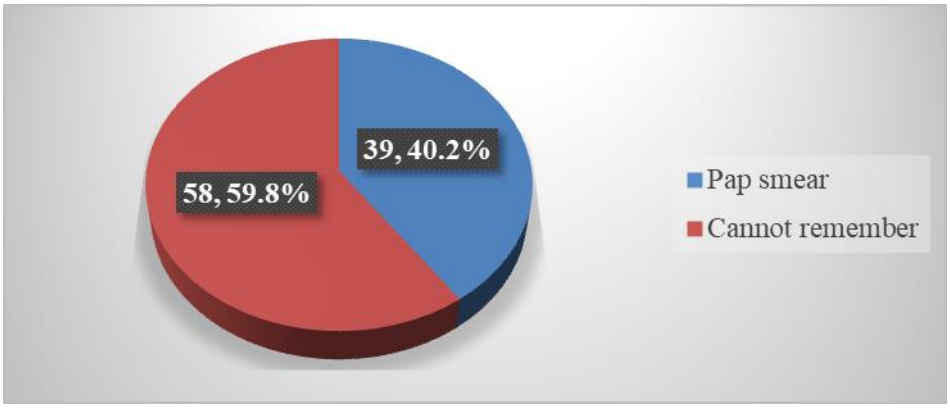


Source: Field Data (2025)

Awareness of Cervical Cancer Screening Methods

The cervical cancer screening methods identified by the respondents are shown in **Figure 7**. The figure indicates that out of the 97 respondents who claimed to be aware of cervical cancer screening methods, about two-fifths (40.2%, n=38) cited Pap smear as a screening method. More than half (59.8%, n=59) could not identify any other cervical cancer screening test.

Figure 7: Awareness of Cervical Cancer Screening Methods



Uptake of Cervical Cancer Screening Services

The survey results regarding cervical cancer screening are summarized in **Table 4.** Among the respondents in the study, only 13.2 percent (n=44) reported having ever been screened for premalignant cervical lesions. The data also indicate that a significant majority, 86.8 percent (n=289), had never undergone screening.

When asked about their reasons for participating in cervical cancer screening, respondents provided multiple responses. The most common reasons included the availability of the

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screening test (38.6%), the procedure being free of charge (50.0%), and the importance of knowing one's health status (61.7%).

According to Table 4, several factors contributed to the respondents' reluctance to undergo cervical cancer screening. The most commonly cited reasons included fear or anxiety about the test results (36.0%), a belief that they are healthy (38.8%), a lack of knowledge about available screening services (6.9%), the assumption that the test is expensive (29.0%), and feelings of shyness (3.8%).

Table 4: Uptake of Cervical Cancer Screening Services

Responses	Frequency	Percent (%)
Ever screened for cervical cancer		
No	289	86.8
Yes	44	13.2
Total	333	100.0
Reasons for screening		
To know my status after hearing about the disease	27	61.3
Available during an outreach programme	17	38.6
It was free	22	50.0
Total	44	100.0
Reasons for not screening		
Fear/Anxiety of positive result	104	36.0
No perceived susceptibility	112	38.8
Never heard about the test	20	6.9
Test is expensive	83	29.0
Shyness	68	23.8
Heard about it when pregnant	11	3.8
Total	289	100.0

Barriers to Cervical Cancer Screening

Table 5 displays the barriers to cervical cancer screening. The most frequently cited barriers include, lack of knowledge about screening services (89.2%, n=297), low level of community awareness (61.0%, n=203), the assumption that the test is expensive (59.2%, n=197), limited access to screening methods (58.6%, n=195), fear of stigma associated with a positive test result (55.6%, n=185), distance to the nearest screening center (52.0%, n=173)

Additionally, a smaller portion of respondents (31.5%, n=105) indicated that the attitude of the personnel discouraged them from using the screening services.

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Table 5 highlights the barriers to cervical cancer screening methods as reported by respondents. The most commonly cited barriers included, lack of knowledge (98%), cost and affordability (65%), limited access to screening services (64.4%), stigma (61.1%), cultural norms (50.5%) Additional barriers noted were fear and anxiety (56.8%), distance to the health facility (57.1%), inadequate follow-up (49.2%), inadequate healthcare infrastructure (49.5%), limited education and awareness (67%), embarrassment (36.3%), and unskilled health personnel (34.7%).

Table 5: Barriers to Cervical Cancer Screening

Barriers	Agreed	Neutral	Disagreed
Lack of knowledge	297 (89.2%)	12 (3.6%)	4 (1.2%)
Fear and anxiety about outcome of rest	172 (51.7%)	102 (30.6%)	39 (11.7%)
Feeling of embarrassment	110 (33.0%)	108 (32.4%)	95 (28.5%)
Language barrier	36 (10.8%)	222 (66.7%)	55 (16.5%)
Cultural and social norms	153 (46.0%)	121 (36.3%)	39 (11.7%)
Limited access to screening methods	195 (58.6%)	105 (31.5%)	13 (3.9%)
Test is expensive	197 (59.2%)	27 (8.1%)	89 (26.7%)
Low level of awareness creation	203 (61.0%)	51 (15.3%)	59 (17.7%)
Inadequate health infrastructure	150 (45.1%)	89 (26.7%)	74 (22.2%)
Attitude of the personnel	105 (31.5%)	213 (64.0%)	15 (4.5%)
Proximity of screening centre	173 (52.0%)	43 (12.9%)	97 (29.1%)
Fear of being stigmatised	185 (55.6%)	29 (8.7%)	99 (29.7%)

Discussion

Knowledge on Cervical Cancer

This study found that 94.0 percent of respondents had heard of cervical cancer. This finding aligns with a study conducted in Cape Verde29, where 94.6 percent of participants reported being aware of cervical cancer. However, this study's high percentage is greater than what was reported in other studies22,24,32,34, which found awareness levels of 83 percent, 94.0 percent, 77.5 percent, and 64.9 percent, respectively. The elevated awareness observed in this study could be attributed to differences in research design, sampling techniques, and the study population; notably, over 70.0 percent of respondents in this study had attained at least a senior high school education

The most common sources of information on cervical cancer identified in this study were mass media (41.0%), maternity clinics (20.0%), schools (11.0%), public health workers (10.0%), screening centers (6.0%), churches (6.0%), and mosques (4.0%). These findings align with a previous study that reported mass media as the primary source of information about cervical cancer (54.3%), followed by health personnel (18.0%), partners (4.9%), and newspapers (0.8%).

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Additionally, this study supports an Ethiopian study, which found that mass media serves as the main source of information. However, it also parallels another Ethiopian study24,31 that indicated social media as the most common source of information, accounting for 35.2%.

The study is inconsistent with results found in others, who also cited social media and the internet as the primary sources of information on cervical cancer and HPV. Although the respondents cited traditional media as their main source of information on cervical cancer, none of them identified social media and the internet as their primary sources. Conversely, none of the reviewed studies also cited religious places as their main source of information. Thus, the Ghanaian is notoriously religious.

In the study on the causes of cervical cancer, only 18.5 percent of respondents identified HPV infection as a cause. This finding aligns with a study conducted in Ethiopia23, which suggested that most respondents were unaware that HPV causes cervical cancer. Similarly, another study reported that only 34.8 percent of the population recognized the association between HPV infection and cervical cancer. Additionally26, research by Tobaiqi et al. (2024)27 indicated that only 37.4 percent of respondents were aware that HPV is a cause of cervical cancer. Furthermore, other studies have reported that only 38 percent of respondents knew that HPV was the primary cause of cervical cancer24,31. In contrast, this present study found a higher percentage of respondents who associated HPV with cervical cancer compared to the previously reported figure of 22.8 percent.

The symptoms of cervical cancer identified by more than half of the respondents in this study were intermenstrual bleeding (93.9%), postmenopausal bleeding (91.1%), menorrhagia (68.1%), dyspareunia (67.7%), and persistent foul vaginal discharge (62.6%). Although the present study found a higher figure in terms of vaginal discharge, it aligns with a study by Yosef et al. (2024)28, who indicated that 27.9 percent of respondents could identify vaginal bleeding as a symptom of cervical cancer. Additionally, the present study confirms a study by Demas et al. (2024)34, which reported that 30.9 percent of women cited vaginal discharge as a symptom of cervical cancer. In contrast, the present study is inconsistent with a study32 that stated 66 percent of respondents did not know any symptom of cervical cancer.

The present study also found that a significant number of the respondents cited having a sexual partner with multiple sexual partners (71.3%), long term use of oral contraceptive (67.7%), having multiple sexual partners (64.9%), HPV infection (62.9%), early sexual debut before age 17 years (62.9%), and immunosuppression (60.7%) factors that predispose the woman's risk of developing cervical cancer. The finding is contrary to the finding in a study by Ali et al. (2024)23, who mentioned that the respondents lacked knowledge of the risk factors. It appears the knowledge of the respondents regarding cervical cancer is higher than the level of knowledge found in most of the reviewed studies.

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Awareness of Cervical Cancer Screening Methods

The present study found that only 31.0 percent of respondents had heard of cervical cancer screening methods or tests. This finding is similar to an Ethiopian study28, which reported that 39.5 percent of respondents were aware of cervical cancer screening services. Although this proportion was higher than that in the current study, it was still lower than in another study30, which found that only 20.3 percent of respondents knew about cervical cancer screening services. Furthermore, the proportion of respondents aware of cervical cancer screening services appears to be about 2.5 times higher than the 12.1 per cent reported in an Ethiopian19, study, where only a small percentage of women were aware of such services. Conversely, Maitanmi et al. (2023)35 reported that more than two-thirds (68.4%) of respondents were aware of cervical cancer screening, which is twice the proportion found in the present study.

The findings indicate that approximately 40.2 percent of the respondents recognized Pap smear as a screening test for cervical cancer, while the remaining 59.8 percent could not identify any screening method. This percentage is notably low compared to a study conducted in Cape Coast33, which reported that 85.7 percent of respondents were aware that the Pap smear is a screening method for cervical cancer. Additionally, the current study reported a higher proportion of awareness than a study in Addis Ababa34, where only 37.7 percent of respondents cited Pap smear as a cervical cancer screening test. Furthermore, in contrast to the findings of Demas et al. (2024)34, where 34.0 percent identified Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI) as screening tests, none of the respondents in the present study recognized these methods.

Systemic Review Across Africa on educational intervantions, 19 studies (2005-2020) looked at interventions aiming to inreasing awareness, knowledge and uptake of screening or vaacination in African women, often combined interventions such lectures, videos, practical demonstrations and used community settings (schools, religious institutions, local gatherings) worked well by increasing awareness and cevical cancer screening uptake47.

Barriers to Cervical Cancer Screening

The study revealed that only 13.2 percent of the respondents had participated in cervical cancer screening, meaning that a significant 86.8 percent had never undergone such screening. Several reasons were identified for their inability to participate: 36.0 percent cited fear or anxiety about the test results, 38.8 percent felt they were healthy and did not need it, 6.9 percent were unaware of available screening services, and 29.0 percent believed that the test was expensive. Although higher prevalence rates were reported in the study by Nyaaba et al. (2023)15, the reasons for the low uptake of cervical cancer screening services were quite similar. These findings align with those of Sampson et al. (2021)17, who noted that more than half of their respondents did not utilize cervical cancer screening services due to the perception that the test was costly

The barriers to cervical cancer screening identified in this study include a lack of knowledge about screening services (89.2%), insufficient community awareness initiatives (61.0%), the

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assumption that the test is expensive (59.2%), limited access to screening methods (58.6%), fear of stigma following a positive test result (55.6%), and the distance to screening centers (52.0%). These findings align with a study by Ziyad et al. (2024)43, which reported common reasons for not utilizing cervical cancer screening such as being too busy and lacking time (18.2%), feeling healthy (16.4%), lack of information (13.6%), fear of the test (12.3%), shyness (10.9%), and fear of a positive result (11.8%). Additionally, these results are supported by another study, which found that reasons for not screening for cervical cancer included a lack of awareness creation (20.3%), fear that a screening test might yield a positive result (37.9%), and beliefs that the cost of screening is high (27.7%). Furthermore, the present study is consistent with findings by George et al. (2022)46, who revealed that low utilization of screening services was due to a lack of awareness creation (25.1%), insufficient healthcare facilities (22.7%), lack of symptoms (11.7%), not feeling at risk (11.9%), and social stigma (9.55%).

Conclusion and Recommendations

Conclusion

The study found that while most respondents were aware of cervical cancer, they lacked knowledge about its causative organism. More than half of the women identified at least three risk factors for cervical cancer. The most commonly cited risk factors included having sexual intercourse with multiple partners, long-term use of oral contraceptives, having a high-risk sexual partner, early sexual debut before age 17, and immunosuppression.

Additionally, most of the women had a fair level of understanding regarding the symptoms of cervical cancer, which included intermenstrual bleeding, postmenopausal bleeding, heavy and prolonged menstrual flow, dyspareunia, persistent foul vaginal discharge, and post-coital bleeding. Regarding cervical cancer screening, about two-fifths of the women recognized the Pap smear as a screening test.

The barriers to cervical cancer screening included fear or anxiety about test outcomes, a lack of perceived risk or susceptibility, insufficient knowledge about screening services, misconceptions that screening tests are expensive, limited access to screening methods, and fear of stigma following a positive test result.

Engagement of chiefs, Queen mothers, and elders briefly on cervical cancer to dispel the suspicion that the campaign is foreign or anti-cultural. Afterwards, Queen mothers should become advocates for screening by mobilizing women’s groups in markets, churches, and mosques for screening services. Chiefs can designate a day as a community health day, allowing health workers to provide education and screening in a culturally accepted manner. Additionally, Imams and Pastors should incorporate messages about cervical cancer prevention into sermons, and utilize major religious gatherings such as Eid, church conventions, and annual festivals to raise awareness by inviting health workers to speak briefly after prayers or services with endorsement from religious leaders.

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The Cervical Cancer Prevention Programme in the Northern Region of Ghana is a result of the collaboration between AMPATH and the Ghana Health Service. This partnership has significantly raised awareness and knowledge among participants, as demonstrated in this study. Additionally, the programme has facilitated the early detection of cervical cancer cases. This flagship initiative is expanding our possibilities. We sincerely hope that with the establishment of a fully operational screening center and the training of qualified nursing and medical personnel, these esteemed services will reach more women in our communities.

Recommendations

The following recommendations are proposed:

1. Boost Awareness Initiatives: Enhance awareness campaigns in hospital departments and local communities through engaging presentations and visual materials on cervical cancer. Utilize hospital TV screens to share important educational content.
2. Increase Training for Healthcare Staff: Train more nurses and midwives in cervical cancer awareness and screening at the Northern Regional Hospital to improve service quality and empower them to educate the community effectively.
3. Expand Screening Access: Offer cervical cancer screening services during evenings, holidays, and weekends to accommodate women's busy schedules, ensuring they have easy access to necessary screenings.
4. Collaborate with NGOs: Partner with Non-Governmental Organizations to secure resources that promote awareness and screening initiatives, aiming to dispel the myth that these services are costly.
5. Conduct Future Research: Plan research studies using qualitative and quantitative methods with larger sample sizes to enhance understanding and generalizability of cervical cancer awareness and screening behaviors.

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The study team gratefully acknowledges the dedicated staff involved in the cervical cancer prevention program in the Northern Region of Ghana for their invaluable contributions. We also extend our sincere appreciation to the Academic Model Providing Access to Healthcare (AMPATH) Ghana, whose partnership and support have been instrumental in advancing this project and strengthening efforts to reduce the incidence of cervical cancer in Ghana.

References

World Health Organization (2025). *Operational considerations for increasing access to cervical cancer screening and treatment women living with HIV* (Issue May). Geneva, Switzerland: World Health Organization

African Health Organisation (2025). *Cervical cancer in Africa fact sheet.* Harare, Zimbabwe: African Health Organisation

Gakidou E, Nordhagen S, Obermeyer Z. (2008). Coverage of cervical cancer screening in 57 countries: low average levels and large inequalities PLoS medicine. 2008;5(6):e132.

Bruni L, Serrano B, Roura E, Alemany L, Cowan M, Herrero R, et al. (2022). Cervical cancer screening programmes and age-specific coverage estimates for 202 countries and territories worldwide: a review and synthetic analysis. Lancet Glob Health. 2022;10(8):e1115–e1127.

Bruni L, Saura-Lázaro A, Montoliu A, Brotons M, Alemany L, Diallo MS, et al. (2021). HPV vaccination introduction worldwide and WHO and UNICEF estimates of national HPV immunization coverage 2010–2019. Prev Med. 2021;144:106399.

Stelzle D, Tanaka LF, Lee KK, Ibrahim Khalil A, Baussano I, Shah ASV, et al. (2021). Estimates of the global burden of cervical cancer associated with HIV. Lancet Glob Health. 2021;9(2):e161–e169

Mohan, W., Maharaj, R. G., & Khan, R. (2025). Prevalence and factors associated with uptake of cervical cancer screening at primary care facilities in Trinidad: a cross-sectional study. *BMJ Public Health, 3, e001297*. doi:10.1136/ bmjph-2024-001297

World Health Organization (2024). *Cervical cancer elimination initiative.* Geneva, Switzerland: World Health Organization.

Planned Parenthood Federation of America (2024). *HPV-the most common sexually transmitted virus.* New York City, United States of America: Planned Parenthood Federation of America.

Zhang, S., Xu, H., Zhang, L., & Qiao, Y. (2020). Cervical cancer: Epidemiology, risk factors and screening. *Chinese Journal of Cancer Research, 32*(6), 20-728. doi: 10.21147/j.

Huang, J., Yunyang, D., Boakye, D., Tin, M.S., Lok, V., Zhang, L., … & Wong, M. S. (2022). Global distribution, risk factors, and recent trends for cervical cancer: worldwide country-level analysis. *Gynecologic Oncology, 164*(1), 85-92.

Opito, R., Ayikobua, E. T., Akurut, H., Alwedo, S., Ssentongo, S. M., Erabu, W. D., Oucul, L., Kirya, M., Bukenya, L. L., Ekwamu, E., Oluka, A. I., Kabwigu, S., Othieno, E., & Mwaka, A. D. (2025). Factors associated with uptake and acceptability of cervical cancer screening among female sex workers in Northeastern Uganda: A cross-sectional study. *PLoS ONE*, *20*(1), 1–16. https://doi.org/10.1371/journal.pone.0312988

Ministry of Health. (2023). 2023 STEPs survey findings: Cervical cancer screening. *Cervical Cancer Screening in Ghana*, 7–10.

Northern Regional Hospital (2025). *AMPATH Ghana works to expand cervical cancer screening and treatment in northern Ghana*. Tamale, Ghana: Northern Regional Hospital. https://www.ampathghana.org/news-blog-feed/ampath-ghana-works-to-expand-cervical-cancer-screening-and-treatment-in-northern-ghana

Nyaaba, J., & Akurugu, E. (2022). Knowledge, barriers and uptake towards cervical cancer screening among female health workers in Ghana: A perspective of the health belief model. *SSRN Electronic Journal*, *10*, 1-30.

Effah, K., Tekpor, E., Wormenor, C. M., Atuguba, B. H., Gedzah, I., Amuah, J. E., & Akakpo, P. K. (2022). **A revolution in cervical cancer prevention in Ghana.** *ecancer* ***16,*** ed123.

Sampson, C. N., Nkpeebo, S. D., & Degley, T. A. (2021). Knowledge, attitude and health beliefs on cervical cancer screening in Ajumako-Eyan-Essiam. *Canadian Oncology Nursing Journal*, *31*(3), 285–292. https://doi.org/10.5737/23688076313285290

Amaike, C., Salami, O., Solarin, T., & Odiari, A. (2024). Knowledge and attitude towards

cervical cancer prevention strategies among female undergraduate students in a private university in Nigeria. *Babcock University Medical Journal*, *7*(1), 30–41.

Eshete, M., Atta, M. A., & Yeshita, H. Y. (2020). Cervical cancer screening acceptance among women in Dabat District, Northwest Ethiopia, 2017: An institution-based cross-sectional study. *Obstetrics and Gynecology International*, *2020*, 1–7.

Mathivha, L., Ramathuba, D. U., & Maputle, M. S. (2023). Factors affecting participation in cervical screening by female nurses in public health institutions in Vhembe District, Limpopo Province. *Nursing Reports*, *13*, 424–435.

Al-Oseely, S., Abdul-Manaf, R., & Ismail, S. (2023). Factors affecting cervical cancer screening among Yemeni immigrant women in Klang Valley, Malaysia: A cross sectional study. *PLoS ONE*, *18*(12), 1–13. https://doi.org/10.1371/journal.pone.0290152

Masood, S., Singh, A., Yadav, A., Singh, P., Srivastava, K., & Banerjee, M. (2024). A study on socio-demographic-based knowledge and awareness for cervical cancer among women from Uttar Pradesh, India. *Clinical Epidemiology and Global Health*, *30*, 101825. https://doi.org/10.1016/j.cegh.2024.101825

Ali, S., Arage, F.G., Tadese, Z.B., Taye, E.A. *et al. (2024).* Cervical cancer screening uptake and its associated factor in Sub-Sharan Africa: a machine learning approach. *BMC Med Inform Decis Mak* **25**, 197. https://doi.org/10.1186/s12911-025-03039-y

Ngari, D. M., Nyamiaka, M. S., & Mukami, F. M. (2021). Factors affecting cervical cancer screening among women below 25 years in Kithare Area, Tharaka Nithi County, Kenya. *Open Journal of Obstetrics and Gynecology*, *11*, 485–503.

Nazrul, N., Fouw, arlieke De, Beltman, J. J., Zeeuw, J. De, Schans, J. Van Der, Koot, J., Rasul, K. G., Kulsum, M. U., Ahmed, S., Rahman, A., Rahman, A., Islam, K. M., Nessa, A., Campbell, C., & Stekelenburg, J. (2024). Understanding cervical cancer awareness in hard-to-reach areas of Bangladesh: A cross-sectional study involving women and household decision makers. *PLoS ONE*, *19*(8), 1–14. https://doi.org/10.1371/journal.pone.0304396

Ogbolu, M. O. (2024). Assessment of HPV knowledge and awareness among students and staff at IBB university, Niger state, Nigeria: Implications for health education and prevention. *Healthcare*, *12*, 665.

Tobaiqi, M. A., Albouq, R. A., Ban, A. M., Alharbi, A. K., Alhejaili, R. A., Alrefaei, H. M., Alahmadi, A. M., Jaan, S. M., Alshinqiti, A. A., Alraddadi, S. A., Alraddadi, A. A., Altowairqi, F. M., Almalki, I. S., & Albadrani, M. (2024). Knowledge, awareness, and attitudes towards HPV and its vaccination among women in the Medina Region: A cross-sectional study. *Healthcare*, *12*, 5–16

Yosef, T., Birhanu, B., & Shifera, N. (2024). Determinants of cervical cancer screening uptake among reproductive-age women in southwest Ethiopia: a case-control study. *Frontiers in Oncology*, *14*(October), 1–8. https://doi.org/10.3389/fonc.2024.1424810

Sousa, N., Rocha, S., Clara, B. M., Luz, L. M. M., & Oliveira, R. (2024). Knowledge, attitudes and practices of cervical cancer screening among female students enrolled in higher education institutions in Cabo Verde. *ECancer*, *18*, 1–12.

Tesfaw, K., Kindie, W., Mulatu, K., & Bogale, E. K. (2022). Utilisation of cervical cancer screening and factors associated with screening utilisation among women aged 30-49 years

in Mertule Mariam Town, East Gojjam zone, Ethiopia, in 2021: a cross-sectional survey. *BMJ Open*, *12*, e067229. https://doi.org/10.1136/bmjopen-2022-067229

Gelassa, F. R., & Nagari, S. L. (2023). Knowledge and practice of cervical cancer screening and its associated factors among women attending maternal health services at public health institutions in Assosa Zone, Benishangul-Gumuz, Northwest sectional study Ethiopia, 2022: A cross-sectional stu. *BMJ Open*, *13*, 1–9. https://doi.org/10.1136/bmjopen-2022-068860

Hhera, J. J., Dahaye, R., Zakayo, W. E., Kazula, Y. Z., Abdul, S., Mamseri, R., & Msuya, S. E. (2025). Factors associated with cervical cancer screening among women of reproductive age in Moshi municipality, Kilimanjaro, Tanzania: a cross--sectional study. *BMJ Open*, *15*, e085223. https://doi.org/10.1136/bmjopen-2024-085223

Diallo, A. A., Codjoe, N. N. A., Ken-amoah, S., & Agbeno, E. K. (2023). Cervical cancer prevention methods: Awareness and use among urban Ghanaian women in Cape Coast, West Africa. *ECancer*, *17*, 1–15.

Demas, T., Biku, T., Getinet, T., Fantahun, B., Bekele, D., Woldehawariat, N., Muzemir, R., & Shoarega, M. (2024). Women's willingness for cervical cancer screening and associated factors among women attending health services in Addis. *Therapeutic Advances in Reproductive Health*, *18*, 1–16. https://doi.org/10.1177/26334941241253181

Maitanmi, J. O., Fabiyi, T. E., Eniola, O., Sansi, T. O., Josiah, B. O., Maitanmi, B., Ojewale, M. O., Dairo, A. A., Adebiyi, D. A., & Akingbade, O. (2023). Knowledge and acceptability of cervical cancer screening among female undergraduates in Babcock University Ilishan-Remo, Ogun State, Nigeria. *ECancer*, *17*, 1–10.

Phaiphichit, J., Paboriboune, P., & Kunnavong, S. (2022). Factors associated with cervical cancer screening among women aged 25-60 years in Lao People's Democratic Republic. *PLoS ONE*, *17*(4), 1–11. https://doi.org/10.1371/journal.pone.0266592

Jemal, Z., Chea, N., Id, H. H., Tesfaye, T., & Abera, N. (2023). Cervical cancer screening utilization and associated factors among female health workers in public health facilities of Hossana town, southern Ethiopia: A mixed method approach. *PLoS ONE*, *18*(5), 1–16. https://doi.org/10.1371/journal.pone.0286262

Alfareh, M., Obeid, D., Alhoshan, H., Basri, R., & Alhamlan, F. S. (2024). Low uptake of Pap test as a cervical cancer screen among Saudi women: Findings from a national survey. *Internatiomal Journal of Gynecology and Obstetrics*, *167*(March), 154–161.

Kulkarni, V. Y., Patil, A. S., & Biswas, S. K. (2025). Acceptability and validity of HPV self-sampling for cervical cancer screening among women living in different ecological settings in India. *International Journal of Cancer*, *156*, 1142–1153. https://doi.org/10.1002/ijc.35222

Osei, E., Id, A., Appiah, S., Id, M. A., Agyekum, S., Acquah, J., Nyamekye, A., Gyasi, A., & Ofori-appiah, C. (2023). Female students' perspectives on cervical cancer screening inclusion in pre-admission university requirements in Ghana. *PLOS Global Public Health*, *3*(6), 1–14. https://doi.org/10.1371/journal.pgph.0001029

Abubakari, A. K., Gross, J., & Boateng, I. K. (2025). Factors influencing cervical cancer screening: A cross-sectional study among ethnically diverse women in the Kumasi

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ISSN: 2581-3366

Metropolis of Ghana. *Health Science Reports*, *8*, 1–18. https://doi.org/10.1002/hsr2.70433

Al-amro, S. Q., Gharaibeh, M. K., & Oweis, A. I. (2020). Factors associated with cervical cancer screening uptake: Implications for the health of women in Jordan. *Infectious Diseases in Obstetrics and Gynecology*, *2020*, 1=9.

Ziyad, Y. A., Jemal, E., Dheresa, M., Usso, A. A., Adem, H. A., Motuma, A., Komicha, M. A., Eyeberu, A., & Yuya, S. A. (2024). Determinants of cervical cancer screening among female health professionals in Harar Town, Eastern Ethiopia: A cross-sectional study. *Infectious Diseases in Obstetrics and Gynecology*, *2024*, 1–9.

Shao, J., Jiang, C., Sun, H., & Han, H. (2024). Knowledge, attitudes, and practices of human papillomavirus and self-sampling among adult women: a cross-sectional study. *Frontiers in Public Health*, *12*, 01–11. https://doi.org/10.3389/fpubh.2024.1377343

Covaliu, B. F., Forray, A. I., Tomic, M., Achimas, P., Ungurean, C., & Melnic, A. (2025). Understanding cervical cancer screening attendance: Barriers and facilitators in a representative population survey. *Cancers*, *17*, 1–17.

George, J. (2022). Factors influencing utilization of cervical cancer screening services among women – A cross-sectional survey. *Clinical Epidemiology and Global Health*, *11*, 1–5. https://doi.org/10.1016/j.cegh.2021.100752.

Aba, M. A., Osei, E., & Darteh, E. K. M. (2022). Educational interventions to increase cervical cancer screening uptake in sub-Saharan Africa: A Sytematic review. BMC Public Health, 22(1), 1612.