

**ENSIGN GLOBAL UNIVERSITY, KPONG
EASTERN REGION, GHANA**

**FACULTY OF PUBLIC HEALTH
DEPARTMENT OF COMMUNITY HEALTH**

**ASSESSING AWARENESS AND KNOWLEDGE OF BREAST AND CERVICAL
CANCER AMONG FEMALE STUDENTS: A CASE STUDY OF AKWAMUMAN
SENIOR HIGH SCHOOL, ASUOGYAMAN DISTRICT, GHANA**

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NOVEMBER, 2025

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BY

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**A THESIS SUBMITTED TO THE FACULTY OF PUBLIC HEALTH, DEPARTMENT
OF COMMUNITY HEALTH, ENSIGN GLOBAL UNIVERSITY, KPONG IN PARTIAL**

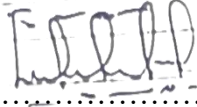
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF PUBLIC HEALTH

NOVEMBER, 2025

DECLARATION

I, Eunice Asabea Addo, hereby declare that this submission is my own work towards the award of the Master of Public Health (MPH) degree and, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of any University, except where due acknowledgement has been made in the text.

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Date

DEDICATION

This work is dedicated to Joana Mercy Akua Asare Addo and Prince Enzo Duodu Adddo, whose unwavering love and support kept me going till this far. To my loving parents and family, whose unwavering support, prayers, and encouragement have been a constant source of strength throughout my academic journey.

And to every young woman striving for knowledge and empowerment: you are the reason for this research.

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ABBREVIATION/ACRONYMS

BC	Breast Cancer
CC	Cervical Cancer
CHPS	Community-Based Health Planning and Services
GHS	Ghana Health Service
GPI	Gender Parity Index
HDI	Human Development Index
HICs	High-Income Countries
HIV	Human Immunodeficiency Virus
HPV	Human Papillomavirus
LMICs	Low- and Middle-Income Countries
MoH	Ministry of Health
NCD	Non-Communicable Disease
SDG	Sustainable Development Goal
SSA	Sub-Saharan Africa
WHO	World Health Organization

ABSTRACT

Background: Breast and cervical cancers are significant public health concerns, particularly for women in low- and middle-income countries like Ghana. Despite ongoing awareness efforts, knowledge gaps and misconceptions persist among adolescent girls, who are a critical population for early intervention. This study was conducted to assess awareness and knowledge of these cancers among female students at Akwamuman Senior High School in the Asuogyaman District of Ghana.

General Objective: This study aims to assess the level of awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School in the Asuogyaman District, Ghana.

Methods: A cross-sectional quantitative study design was employed using a stratified random sampling method. A total of 394 female students were selected proportionally from different academic levels and programs. Data was collected through a structured, pre-tested questionnaire administered via Kobo Collect. Descriptive statistics, chi-square tests, and logistic regression analyses were conducted using STATA version 18 to evaluate associations between awareness, knowledge, and socio-demographic variables.

Results: Awareness of breast cancer was high (97.2%), but only 31.7% of participants had "Good Knowledge" of the disease. Misconceptions were widespread, with 60.9% of students incorrectly believing that wearing tight bras can cause breast cancer. Practical knowledge was more encouraging, with 69.3% reporting they knew how to perform breast self-examinations. Awareness of cervical cancer was moderate (75.4%), yet specific knowledge on key preventive measures such

as HPV vaccination (32.5%) and Pap smear screening (42.4%) was low. Healthcare providers were the most cited source of information, followed by schools and media platforms.

Older students and those in higher academic levels tended to have better awareness and knowledge, though these demographic factors were not statistically significant predictors in multivariate analyses. However, a strong and statistically significant positive association was observed between awareness and knowledge for both breast and cervical cancer.

Conclusion: Overall, female students at Akwamuman Senior High School have a modest awareness of cervical cancer and an almost universal awareness of breast cancer; nevertheless, there are notable disparities in their in-depth knowledge and the prevalence of misconceptions regarding both illnesses. The close connection between awareness and knowledge emphasizes how important basic knowledge is. But a change from broad awareness to precise, all-encompassing understanding is taking place. These findings demonstrate the pressing need for specific, research-based educational interventions in classrooms. In order to promote early detection and enhance long-term results, these programs must specifically address common misconceptions, demystify common risk factors and preventative measures—most notably, HPV vaccination and Pap smear screening for cervical cancer—and provide students with useful self-examination skills.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Breast neoplasia and cervical carcinoma represent two of the most critical health dilemmas confronting women on a global scale, especially in low- and middle-income nations (LMICs). These malignancies are principal contributors to premature mortality in the female population, with breast neoplasia being the most frequently diagnosed form of cancer and cervical carcinoma occupying the position of the fourth most prevalent cancer among women internationally (*Vu et al., 2018*); (*Sung et al., 2021*). In the year 2020, there were 2.3 million newly identified instances of breast cancer worldwide, culminating in approximately 685,000 fatalities (*Arnold et al., 2022*). Similarly, cervical cancer accounted for 604,127 new cases and 342,000 deaths in the same year, with approximately 90% of these deaths occurring in LMICs (*Sung et al., 2021*); (*WHO, 2021*); (*Burmeister et al., 2022*).

On a global scale, the prevalence of breast and cervical malignancies has exhibited a significant upward trend over the decades (source). The incidence rate of breast cancer has escalated at an estimated annual rate of 3.1% over the preceding thirty years, whereas the mortality rate has experienced an increase of 1.8% per annum during the identical timeframe (*Sung et al., 2021*). Cervical cancer, on the other hand, is projected to cause 443,000 deaths annually by 2030, with 98% of these deaths occurring in LMICs (*Burmeister et al., 2022*); (*Rocha et al., 2024*). The disparity in outcomes between high-income countries (HICs) and LMICs is stark, with LMICs experiencing higher mortality rates due to late-stage diagnosis, limited access to healthcare services, and poor implementation of prevention and screening programs (*Denny et al., 2017*); (*Hull et al., 2020*).

In Africa, breast and cervical cancers are particularly significant public health concerns. Sub-Saharan Africa (SSA) has some of the highest mortality rates for both cancers globally, with breast cancer mortality rates ranking among the world's highest and a five-year survival rate of less than 40% (Denny *et al.*, 2017); (Black and Richmond, 2019). Sub-Saharan Africa (SSA) bears the most significant global burden of cervical cancer, exhibiting the highest rates of both new cases and fatalities. Despite being the second most common cancer among women continent-wide, the disease poses a critical and disproportionate public health challenge in SSA, especially when observed among the younger female demographic (Burmeister *et al.*, 2022). Studies indicate that the burden of these cancers in Africa is exacerbated by socio-economic challenges, poor healthcare infrastructure, and limited awareness and knowledge about the diseases and their prevention (Denny *et al.*, 2017); (Rademaker, Bhandary and Harder, 2022).

In Ghana, breast and cervical cancers are the most common cancers among women and the leading causes of cancer-related deaths (Bray *et al.*, 2018); (Anaba *et al.*, 2024). Breast cancer accounts for 20.4% of all cancer cases in the country, with a high mortality rate due to late diagnosis and limited access to early detection and treatment services (Okyere Asante *et al.*, 2023). Cervical cancer follows closely, accounting for 13.5% of cancer cases, with an estimated 3,151 new cases and over

2,000 deaths annually (Bruni *et al.*, 2019). Despite the availability of screening methods such as Pap smears and Visual Inspection with Acetic Acid (VIA), cervical cancer screening utilization remains low in Ghana, with studies citing deficits in knowledge, awareness, and access to healthcare services as major barriers (Binka, Nyarko and Doku, 2016); (Sampson, Nkpeebo and Degley, 2021).

Evidence suggests that knowledge and awareness of breast and cervical cancer are critical determinants of preventive health behavior and early detection (Elbarazi *et al.*, 2023). However,

studies conducted in Ghana and other African countries reveal significant gaps in knowledge and awareness. For instance, a study conducted in Ghana found that only 28% of women had adequate knowledge of cervical cancer, while 68.4% were unaware of the disease altogether (*Ebu et al., 2014*). Similarly, a study among female university students in Ghana reported poor cervical cancer screening behavior despite fair perceptions of the disease (*Binka, Nyarko and Doku, 2016*). These findings are consistent with studies conducted in other African countries, such as Ethiopia, where knowledge of cervical cancer screening remains alarmingly low, with only 50% of women in Ethiopia being aware of the disease and its prevention (*Aweke, Ayanto and Ersado, 2017*).

Within the Ghanaian context, female students represent a vital demographic for breast and cervical cancer awareness and prevention efforts. As future leaders and potential advocates for health education, their knowledge and attitudes toward these cancers are critical in shaping public health outcomes. However, research indicates that even among educated populations, awareness and knowledge levels in the sub-Saharan African region remain suboptimal (*Binka, Nyarko and Doku, 2016*); (*Pierz et al., 2020*); (*Effiong, Afolabi and Chinedu, 2023*). This highlights the need for targeted interventions aimed at improving knowledge, attitudes, and practices toward breast and cervical cancer among female students in Ghana (*Rerucha, Caro and Wheeler, 2018*); (*Williams et al., 2018*).

To the best of the authors' knowledge, and based on a review of existing literature, no study has specifically examined the awareness and knowledge of breast and cervical cancer among senior high school students in the Asuogyaman District. This study therefore sought to assess the level of awareness and knowledge of these cancers among female students at Akwamuman Senior High School in the Asuogyaman District of Ghana.

1.2 Problem Statement

Despite advancements in prevention, early detection, and treatment, breast and cervical cancers continue to disproportionately impact women in low- and middle-income countries (LMICs), including Ghana (*Bouvard et al., 2021*); (*WHO, 2024a*); (*WHO, 2024b*). Ghana faces a rapidly intensifying burden of breast cancer. Data shows that the incidence rate rose substantially from 23.8 per 100,000 in 2008 to 37.8 per 100,000 by 2018 (Anaba et al., 2024). The recorded 4,645 new cases of breast cancer in 2020 represent over a 100% increase from the 2,240 cases documented in 2012, with nearly half of all cases proving fatal (Anaba et al., 2024). Breast cancer is currently attributed to 12.4% of all cancer-related deaths among the nation's female population. Additionally, the prevalence of cervical cancer (35.4%) in Ghana far exceeds the Sustainable Development Goal (SDG) target of fewer than 4 cases per 100,000 women (*Mensah and Mensah, 2020*); (*Anaba et al., 2024*).

Numerous studies indicate that a significant proportion of Ghanaian women present with advanced stages of these diseases, largely due to poor knowledge, myths, stigma, and inadequate screening uptake (*Binka, Nyarko and Doku, 2016*); (*Martei, Vanderpuye and Jones, 2018*); (*Agbokey et al., 2019*); (*Sampson, Nkpeebo and Degley, 2021*). Despite national policies and international initiatives promoting early detection and public education, awareness of breast and cervical cancer among young women remains alarmingly low (*Betty Pearce, Lydia Aziato, and Gloria Achempim-Ansong, 2023*); (*Afaya et al., 2024a*); (*Anaba et al., 2024*). Adolescents and young adults, particularly senior high school students, represent a critical demographic for health promotion and disease prevention. Early knowledge of cancer risk factors, signs and symptoms, and screening methods has been shown to positively influence attitudes and behaviors later in life (*Heena et al., 2019*); (*Nsaful et al., 2022*); (*Dedey et al., 2024*). However, research focused on this age group, especially in the Ghanaian context, is limited. The few available studies suggest that

many young women harbor misconceptions about breast and cervical cancer, are unaware of available screening services, and lack access to structured health education on the subject (*Ebu et al., 2014*); (*Binka et al., 2019*).

Moreover, disparities in cancer awareness between urban and rural areas, and across different regions of Ghana (*Ken-Amoah et al., 2022*); (*Adzibli et al., 2025*), further highlight the need for localized studies. In semi-urban and rural districts like Asuogyaman, where healthcare infrastructure and health promotion activities may be inadequate (*Sokey and Adisah-Atta, 2017*); (*Binka et al., 2019*); (*Wongnaah et al., 2025*), young women are especially vulnerable to misinformation and neglect.

Without a localized assessment of breast and cervical cancer awareness among adolescent girls in educational institutions, Ghana risks overlooking critical insights into the knowledge gaps, attitudinal barriers, and behavioral patterns that shape early prevention. This lack of context specific evidence limits the ability of educators, health policymakers, and healthcare providers to design age-appropriate, culturally sensitive, and school-based interventions that can empower young women with life-saving information.

1.3 Rationale of Study

In Ghana, national frameworks such as the Non-Communicable Disease (NCD) (Policy, 2022) and The National Strategy for Cancer Control in Ghana (2012–2016) prioritize early detection, awareness creation, and access to screening services, particularly for women and girls, and are currently undergoing review to reflect updated epidemiological trends and WHO targets (*Ministry of Health, 2011*); (*Ministry of Health, 2022*). Despite these policy efforts, breast and cervical cancers continue to claim the lives of many Ghanaian women, largely due to late-stage diagnosis, low screening rates, and limited knowledge about the diseases.

Data from the Ghana Demographic and Health Survey shows that only 5.0% of Ghanaian women of reproductive age have undergone cervical cancer screening, and 18.4% have been screened for breast cancer (*Anaba et al., 2024*). These low screening rates are particularly concerning among adolescents and young women, a critical demographic for early intervention. Research consistently demonstrates that awareness regarding cervical cancer and its crucial preventive measures remains limited within this demographic. For example, a study conducted among female senior high school students in the Lower Manya Krobo Municipal area revealed significantly low knowledge levels: only 17.7% were aware of the Human Papillomavirus (HPV) vaccine, and only 29.3% were knowledgeable about cervical cancer screening methods (*Manortey and Agyemang, 2018*).

The rationale of this study is therefore rooted in the fact that it will generate context-specific data that contributes to the global discourse on youth engagement in cancer prevention while serving as a reference in designing culturally appropriate and age-sensitive health promotion strategies. This study will benefit multiple stakeholders by providing localized, evidence-based insights into adolescent knowledge gaps and barriers to cancer prevention. Policymakers and public health planners can use the findings to inform policy and strengthen health advocacy. Educational authorities will gain data to support integrating cancer and reproductive health education into school curricula. Healthcare providers and NGOs will be better equipped to design adolescent friendly outreach and screening programs that address both informational and cultural challenges. Female students and their families stand to benefit from increased awareness, leading to early detection and reduced stigma. Researchers will also gain a foundation for further inquiry into youth cancer education and regional health disparities.

This study is particularly timely and relevant as it aligns directly with the United Nations Sustainable Development Goal (SDG) 3, which aims to ensure healthy lives and promote wellbeing for all at all ages (*Howden-Chapman et al., 2017*). Target 3.4 specifically seeks to reduce

premature mortality from non-communicable diseases (NCDs) through prevention and treatment by 2030 (*Howden-Chapman et al., 2017*). The study also contributes to SDG 5 (Gender Equality) by addressing a gender-specific health burden and empowering young women to take control of their health.

1.4 Conceptual Framework

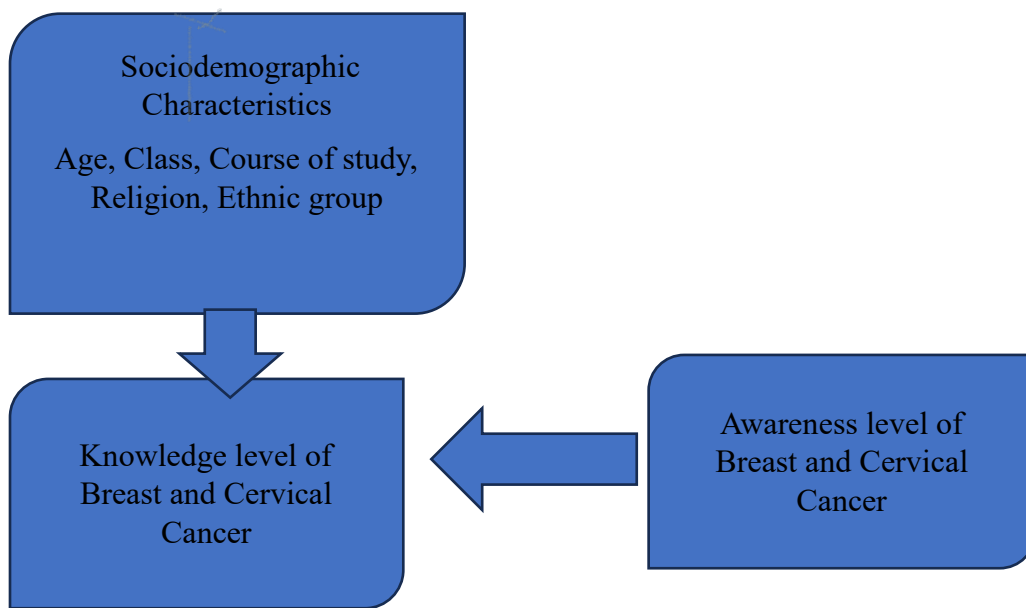


Figure 1.0: *Conceptual Framework of Study (Knowledge, Attitude, Practice Model)*

Source: (WHO (1978); UNICEF (1988))

This study adopts a conceptual framework grounded in the Knowledge dimension of the Knowledge–Attitude–Practice (KAP) model to guide the assessment of breast and cervical cancer awareness and knowledge among female students. The framework illustrates how sociodemographic factors influence students’ knowledge of breast and cervical cancer, and how awareness subsequently contributes to knowledge acquisition.

The KAP model, originally developed in public health research, explains that health-related behaviors evolve through three progressive stages: knowledge, attitude, and practice (Launiala, 2009); (WHO, 2008). The model assumes that individuals must first acquire knowledge about a health issue before developing positive attitudes and adopting preventive behaviors. However, since the present study is limited to the cognitive domain, the framework emphasizes the knowledge component, which reflects the extent of understanding individuals possess about breast and cervical cancer. Knowledge is influenced by exposure to information, personal experience, and socio-demographic characteristics such as age, educational level, field of study, and access to health information sources (Tarkang & Zotor, 2015); (Rahman et al., 2020).

Within this framework, socio-demographic factors—including age, class, course of study, religion, ethnic group, serve as independent variables that determine the degree to which individuals are exposed to and comprehend information about breast and cervical cancer. These background factors influence one's opportunity to access health information, interpret messages, and develop knowledge about these diseases. For instance, students in health-related programs or those at higher levels of study often have greater exposure to cancer-related information compared to those in non-health disciplines (Akpo et al., 2022).

Awareness represents the initial stage of the knowledge process, defined as the state of having heard of or being conscious of the existence of breast and cervical cancer, as well as available screening and prevention options (Ndejjo et al., 2017). Awareness acts as a precursor to knowledge, since individuals who are aware of a disease are more likely to seek additional information that enhances their understanding (Yahya et al., 2019). Within this framework, awareness may mediate the relationship between socio-demographic characteristics and knowledge acquisition. However,

due to the scope and page limitations of this study, this mediating effect is not examined in detail and is recommended for future research.

Finally, knowledge, the principal outcome variable, refers to a comprehensive understanding of breast and cervical cancer — encompassing risk factors, symptoms, preventive measures, and screening methods such as breast self-examination, clinical breast examination, Pap smear, and HPV vaccination (Abotchie & Shokar, 2009); (Al-Dubai et al., 2012). The level of knowledge is expected to vary based on individuals' awareness levels and socio-demographic characteristics.

1.5 Research Questions

1. What is the level of awareness and knowledge of breast cancer among female students at Akwamuman Senior High School?
2. What is the level of awareness and knowledge of cervical cancer among female students at Akwamuman Senior High School?
3. What factors influence the level of knowledge about breast cancer among female students at Akwamuman Senior High School?
4. What factors influence the knowledge level about cervical cancer among female students at Akwamuman Senior High School?

1.6 General Objective

To assess the level of awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School in the Asuogyaman District of Ghana.

1.7 Specific Objectives

1. To assess the level of awareness and knowledge about breast cancer among female students in Akwamuman Senior High School.
2. To determine the level of awareness and knowledge about cervical cancer among female students at Akwamuman Senior High School.
3. To identify the factors influencing level of knowledge about breast cancer among female students at Akwamuman Senior High School.
4. To investigate the factors influencing the level of knowledge about cervical cancer among female students at Akwamuman Senior High School.

1.8 Profile of Study Area

The Asuogyaman District constitutes one of the 33 Municipal and District Assemblies within Ghana's Eastern Region. Its establishment in 1988, under Local Government Instrument (L.I. 1431), was a direct outcome of Ghana's national decentralization program. This district was officially created following the re-demarcation and division of the former Kaoga District, which was historically headquartered in Somanya (*Asuogyaman District Assembly, 2023*). Geographically, the district lies between latitudes 6°34' N and 6°10' N and longitudes 0°1' W and 0°14' E, covering an estimated surface area of 1,507 square kilometres, approximately 5.7% of the Eastern Region's total area (*Asuogyaman District Assembly, 2023*). The district's geographical boundaries are comprehensively delineated: it adjoins the Kwahu Afram Plains North to the north, the Upper Manya Krobo District to the west, and the Lower Manya Krobo District to the south. To the east, it shares borders with the South Dayi, Ho West, and North Tongu Districts. Due to the presence of the Volta Lake, which intricately traverses the area, the Asuogyaman District has

emerged as a central location supporting significant tourism, aquaculture, and agricultural development (*Asuogyaman District Assembly, 2023*).

According to the 2021 National Population and Housing Census, the district has a population of 101,256, composed of 52,802 females (52%) and 48,723 males (48%). This figure was projected to increase to approximately 105,627 by 2023, highlighting the district's steady population growth (*GSS, 2021*). The district's economy is primarily agrarian, with agriculture employing about 60% of the population. Major crops grown include yam, cassava, plantain, banana, and pepper, while livestock rearing includes cattle, goats, sheep, pigs, and poultry (*Asuogyaman District Assembly, 2023*). Notably, the district is Ghana's leading producer of tilapia, with an annual output of 12,000 metric tonnes. In addition to agriculture, the district's markets located in Akosombo, Atimpoku, Frankadua, Marine, and Sapor play a vital role in the movement of commodities such as maize, cassava, yam, and fish to larger markets in Accra, Tema, and Koforidua (*Asuogyaman District Assembly, 2023*). The district has a road network of about 185.9 kilometres, of which 130.2 kilometres are tarred, and 55.7 kilometres remain untarred. Electrification in the district has significantly improved due to its proximity to the Akosombo Hydro-electric Plant, with most major towns such as Akosombo, Atimpoku, and Anum connected to the national grid (*Asuogyaman District Assembly, 2023*). The district has a total of 30 health facilities, including one hospital, 11 health centers, two private hospitals, and 16 functional CHPS centers. Educational infrastructure comprises 283 schools (184 public and 99 private) including basic and second-cycle institutions. The district records a Gender Parity Index (GPI) of 1.02, 1.04, and 1.07 for Kindergarten, Primary, and Junior High School levels, respectively. The overall school completion rate stands at 74% (*Asuogyaman District Assembly, 2023*).

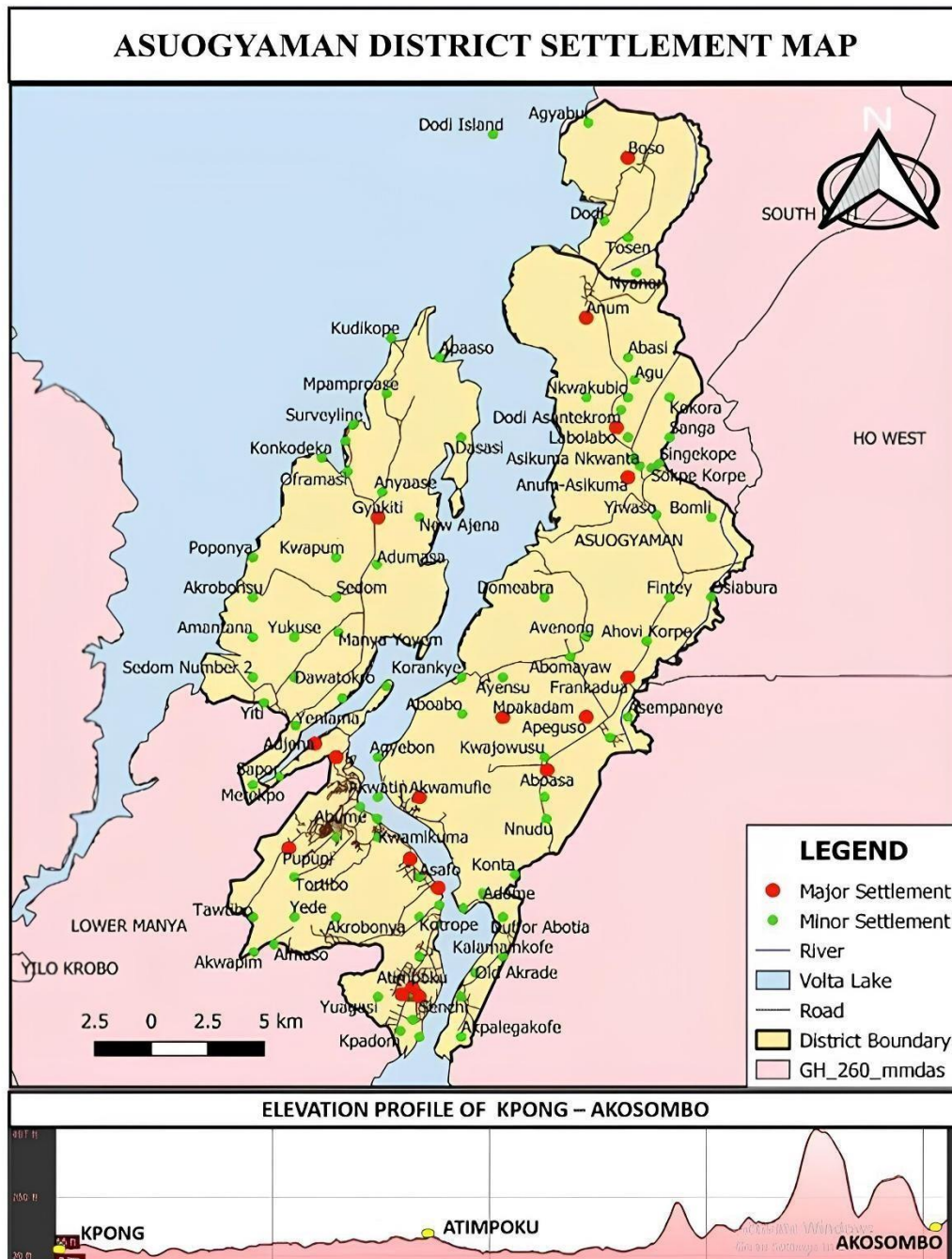


Figure 2.0: Map of Asuogyaman District

Source: (Asuogyaman District Assembly, 2023)

1.9 Scope of Study

This study is confined to assessing the level of awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School, located in the Asuogyaman District of Ghana. The focus is specifically on female students because they are the primary at-risk population for these types of cancers. The study covered three main areas: the sources from which students receive information about breast and cervical cancer, the depth of their knowledge and awareness, and the factors that influence their understanding of these health issues. The findings are limited to this particular institution and may not be generalized to other schools or regions without further research.

1.10 Organization of Report

This report is organized into six chapters, each focusing on a key aspect of the research. Chapter One (Introduction) provides the background of the study, problem statement, research objectives, research questions, significance of the study, scope of study, and the organization of the report.

Chapter Two (Literature Review) examines existing literature relevant to breast and cervical cancer, including global and local perspectives on awareness, knowledge, and influencing factors among young women, especially students. Chapter Three (Methodology) outlines the research design, target population, sampling techniques, data collection methods, and data analysis procedures used in the study.

Chapter Four (Results) presents the data collected from the field, including demographic information and findings related to the specific objectives of the study. Chapter Five (Discussion) interprets and discusses the findings of the study in relation to the existing literature, highlighting key patterns, differences, and implications.

Chapter Six (Conclusions and Recommendations) summarizes the main findings, draws conclusions based on the objectives, and provides recommendations for stakeholders such as school authorities, health educators, and policy makers.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing literature relevant to breast and cervical cancer awareness and knowledge, with a focus on female adolescents and school populations. By reviewing available literature, this chapter aims to provide an empirical foundation for the current study and to highlight gaps that this research seeks to address within the context of Akwamuman Senior High School in the Asuogyaman District of Ghana.

2.2 Epidemiology of Cervical Cancer

Globally, cervical cancer represents the second leading cause of both cancer incidence and mortality among women of reproductive age. A significant feature of this distribution is the pronounced disease burden concentrated within nations characterized by the lowest Human Development Index (HDI) scores (*Arbyn et al., 2020*); (*Mattiuzzi and Lippi, 2020*); (*Sung et al., 2021*). In 2018 alone, an estimated 570,000 new cases and 311,000 deaths were recorded globally, positioning cervical cancer as the fourth most frequently diagnosed cancer in women (*Bray et al., 2018*).

According to more recent data, around 660,000 new cases were identified in 2022, with approximately 350,000 deaths, 94% of which occurred in low- and middle-income countries (*Sahasrabuddhe, 2024*); (*WHO, 2024b*). The geographical distribution of cervical cancer is notably uneven. The highest incidence and mortality rates are found in sub-Saharan Africa, Central

America, and Southeast Asia (*WHO, 2024b*). For instance, cervical cancer is the most commonly diagnosed cancer in 28 countries and the leading cause of cancer death in 42 countries, most of which are located in sub-Saharan Africa and South-East Asia (*Ferlay et al., 2019*); (*WHO, 2024b*).

In contrast, the rates in North America, Australia/New Zealand, and Western Asia (including Saudi Arabia and Iraq) are 7 to 10 times lower (*Small et al., 2017*). These regional differences are attributed to variations in HPV vaccination coverage, availability of cervical screening, treatment infrastructure, HIV prevalence, and broader socioeconomic determinants such as gender inequality and poverty (*WHO, 2024b*).

The disease also has a notable demographic dimension. Over the past three decades, there has been a substantial increase in the proportion of young women affected by cervical cancer, ranging from 10% to 40% (*Sung et al., 2017*). It disproportionately impacts younger women, leading to devastating socio-familial consequences; approximately 20% of children who lose their mother to cancer experience this loss due to cervical cancer (*Guida et al., 2022*). This burden is worsened among women living with HIV, who are six times more likely to develop cervical cancer compared to the general population (*Stelzle et al., 2021*); (*WHO, 2024b*). HIV infection not only increases susceptibility to HPV but also accelerates the progression from HPV infection to cancer (*Stelzle et al., 2021*); (*WHO, 2024b*). Approximately 5% of all cervical cancer cases are directly attributable to HIV (*Ibrahim Khalil et al., 2022*); (*WHO, 2024b*).

The aetiology of cervical cancer is well-established, with persistent infection by high-risk human papillomavirus (HPV) identified as the primary cause (*Arbyn et al., 2020*); (*WHO, 2024b*). HPV is a common sexually transmitted infection, and while most infections are cleared by the immune system, persistent infection with oncogenic HPV types can lead to the development of abnormal

cervical cells (*Tripathi and Sahu, 2022*); (*WHO, 2024b*). If untreated, these abnormalities can progress to cancer, typically over a span of 15 to 20 years (*Tripathi and Sahu, 2022*).

However, in immunocompromised individuals, particularly those with untreated HIV, this progression can occur more rapidly, within 5 to 10 years (*WHO, 2024b*). Additional risk factors influencing this progression include the specific HPV genotype, immune status, co-infection with other sexually transmitted infections, early age at first pregnancy, number of births, use of hormonal contraceptives, and tobacco smoking (*Yang et al., 2022*); (*WHO, 2024b*); (*Wu et al., 2025*).

Vaccination against HPV between the ages of 9 and 14 is highly effective in preventing infection and subsequent malignancies (*Rahangdale et al., 2022*); (*WHO, 2024b*). Furthermore, routine screening starting at age 30 or 25 for women living with HIV can detect precancerous changes that, if treated promptly, can prevent progression to cancer (*WHO, 2024b*); (*WHO, 2024c*). Across all ages, early detection followed by timely and high-quality treatment remains a cornerstone of effective cervical cancer control (*Kessler, 2017*); (*WHO, 2024c*).

2.3 Knowledge and Awareness of Cervical Cancer among Young Females

In the United States, a study by (*Akinlotan et al. 2017*) revealed that 3.2% of respondents were not aware of any of the risk factors. Among participants who accurately identified one or more risk factors, only 60.5% were aware that multiple sexual partners posed a risk (*Akinlotan et al., 2017*). Furthermore, participants were less aware of the higher risk of cervical cancer due to having sex at a young age (51.5%), or smoking cigarettes (49%). In general, only eight percent of the study sample identified all ten risk factors for cervical cancer (*Akinlotan et al., (2017)*).

A European study conducted among Maltese women showed that 74.94% of the participants were able to identify more than 3 symptoms when prompted, with the most identified symptoms being post-menopausal bleeding, persistent pelvic pain and weight loss (*Deguara, Calleja and England, 2021*). Additionally, 46.44% were unable to identify any risk factors, while only 10.32% of participants were able to correctly identify the two most important factors, which are multiple sexual partners and HPV infection. Only 38.1% of the research population knew that HPV infection is a risk factor (*Deguara, Calleja and England, 2021*).

Evidence from women in Kampong Speu Province, Cambodia found that 74 and 34% of women had heard about cervical cancer and the Papanicolaou (Pap) Smear test, respectively (*Touch and Oh, 2018*). Furthermore, 35% of women were aware that cervical cancer is preventable by vaccination (*Touch and Oh, 2018*). Similarly, an Indian study found that, majority of the respondents, 96.6% have good knowledge about cervical cancer screening, nevertheless the vast majority (98.9%) of the women have never been vaccinated against cervical cancer (*Krishnaveni, Roy and Sambathkumar, 2018*).

A comprehensive analysis of demographic and health survey data from five sub-Saharan African countries revealed that overall cervical cancer awareness was limited, with only 39% of women aged 30-49 reporting ever having heard of cervical cancer (*Olivieri et al., 2025*). This study documented cervical cancer awareness varying across countries: in Benin it's low at 11%, in Mozambique 36%, in Madagascar 38%, in Mauritania 49%, and in Cameroon 53% (*Olivieri et al., 2025*).

One study in Ethiopia among female students revealed that more than half of the participants (59.6%) were unaware of the primary cause of cervical cancer, while only 19.5% correctly

identified HPV as the main cause (*Tesfaye et al., 2019*). Additionally, 83.9% did not know of any other potential causes (*Tesfaye et al., 2019*).

A hospital-based case-control study conducted in two Ghanaian teaching hospitals revealed profoundly low levels of cervical cancer knowledge among women, with the study revealing that 78.9% of women had never heard of the Pap smear test (*Nartey et al., 2025*). Similarly, another Ghanaian study among high schoolers revealed that most students (mean age = 17) did not know that early sexual debut (before 18 years) is a risk factor for cervical cancer (72%) and that a blood test cannot detect cervical cancer (71%) (*Ampofo et al., 2024a*).

2.4 Sources of Information on Cervical Cancer Among Young Females

Research among Ghanaian senior high school students provide insights into young women's preferences for health information sources. A comprehensive multi-site cross-sectional survey of 2,400 female students aged 16-24 years found that doctors were endorsed by 87% of students as preferred sources of cervical cancer education, followed by nurses at 80%, and credible health organizations at 78% (*Ampofo, Boyes and Mackenzie, 2023*).

Additional research examining cervical cancer information sources in urban Ghanaian communities revealed that health facilities served as the most popular source of cervical cancer information, followed by mass media and religious organizations like the church/mosque (*Bonful et al., 2022*).

2.5 Factors Influencing Awareness and Knowledge of Cervical Cancer

A study by (*Mijiti et al. 2023*) in Kashi, China showed that living in the urban(AOR = 1.358,95% CI:1.111–1.659), occupation of non-farming and non-housewife(AOR = 2.680,95%CI:2.126–3.377), education level of high school and above (AOR = 1.388,95%CI:1.125–1.712), and four or

more access to knowledge (AOR = 1.446, 95% CI: 1.099–1.903) were protective factors for cervical cancer knowledge knowing.

A parallel study conducted on Omani women demonstrated that specific socioeconomic factors—namely marital status, educational attainment, and household income—were statistically associated with achieving adequate knowledge scores regarding [topic implied, likely cancer screening/prevention], indicated by $P < 0.05$. Conversely, variables such as age, family history of cancer, the husband's educational level, parity, and abortion history were found to have no statistically significant association with knowledge scores ($P > 0.05$) (Alwahaibi *et al.*, 2018).

Furthermore, regular health checkups, education level, gender, marital cohabitation status, and income were identified as significant factors influencing breast cancer awareness (Islam *et al.*, 2025). Participants in a Bangladeshi study who underwent regular health checkups were significantly more informed (87.03%, $p < 0.001$). Multivariate logistic regression analyses indicated that each additional year of schooling increased the likelihood of awareness by 16–20% (Islam *et al.*, 2025).

These previous findings do not differ from that of the sub-Saharan African region. According to (Okunowo *et al.* 2018), prior counselling by doctors/nurses and knowing someone with cervical cancer significantly increased the knowledge of cervical cancer, while high level of education was significantly associated only with increased knowledge of cervical cancer and awareness of Pap smear among Nigerian participants.

2.6 Epidemiology of Breast Cancer

Breast cancer is a disease in which abnormal breast cells grow out of control and form tumors (WHO, 2024a). From 2000 to 2018, the global incidence of breast cancer in women rose markedly, from approximately 1.05 million cases in 2000 to 2.09 million in 2018 (Bray *et al.*, 2018). Despite

this sharp increase, the number of deaths has shown variable trends rising from 370,000 in 2000 to around 520,000 in 2012, but subsequently declining to 310,000 by 2018 (*Torre et al., 2015*); (*Bray et al., 2018*); (*Siegel, Miller and Jemal, 2020*); (*Shang and Xu, 2022*). By 2020, breast cancer surpassed lung cancer to become the most commonly diagnosed cancer globally, with 2.3 million new cases accounting for 11.7% of all cancer cases (*Sung et al., 2021*).

Among women, breast cancer constitutes one-quarter of all cancer diagnoses and one-sixth of cancer deaths, ranking first in both incidence and mortality in the majority of countries (*Sung et al., 2021*). However, notable exceptions exist, particularly for mortality, where lung cancer remains the leading cause of cancer death in regions such as Australia/New Zealand, Northern Europe, North America, and China, and cervical cancer dominates in many sub-Saharan African countries (*Shang and Xu, 2022*).

Breast cancer occurs in every country and affects women at any age after puberty, though incidence increases with advancing age (*Shang and Xu, 2022*); (*WHO, 2024a*). In 2022 alone, there were 2.3 million new diagnoses and 670,000 deaths worldwide (*WHO, 2024a*). Global data show stark disparities in breast cancer burden based on levels of socioeconomic development. In very high Human Development Index (HDI) countries, 1 in 12 women will be diagnosed with breast cancer in their lifetime, and 1 in 71 will die from it (*WHO, 2024a*). In contrast, in low-HDI countries, the lifetime risk of diagnosis is lower (1 in 27) but the mortality risk is disproportionately higher, with 1 in 48 women dying from the disease (*Shang and Xu, 2022*); (*WHO, 2024a*).

Breast cancer originates from abnormal cells in the milk ducts or lobules of the breast. While noninvasive forms (in situ) are not life-threatening and may be detected early, invasive cancers can spread to surrounding breast tissue, lymph nodes, and distant organs such as the lungs, liver, brain, and bones. This progression, known as metastasis, can be fatal. Most people do not exhibit

symptoms in the early stages, making early detection critical (*Scully et al., 2012*); (*WHO, 2024a*). When symptoms do appear, they may include a painless lump or thickening in the breast, changes in breast size or appearance, skin dimpling, nipple abnormalities, or abnormal nipple discharge (*WHO, 2024a*).

Multiple risk factors are associated with breast cancer, the most significant being female gender, with women accounting for approximately 99% of cases. Other established risk factors include increasing age, obesity, alcohol consumption, tobacco use, family history of breast cancer, radiation exposure, reproductive history, and postmenopausal hormone therapy (*Sung et al., 2021*); (*WHO, 2024a*). Nonetheless, about half of all breast cancers occur in women with no identifiable risk factors other than being female and over 40 years old (*Sung et al., 2021*); (*WHO, 2024a*).

While a family history of the disease increases the risk, most women diagnosed with breast cancer do not have a known familial link, indicating that absence of family history does not equate to low risk (*Sung et al., 2021*). Certain inherited mutations, particularly in BRCA1, BRCA2, and PALB2 genes, substantially elevate risk, and women with these genetic predispositions may consider preventive strategies such as prophylactic surgery or chemoprevention (*Sung et al., 2021*); (*WHO, 2024a*).

2.7 Knowledge and Awareness of Breast Cancer Among Young Females

In a Pakistani study by (*Hussain et al., 2022*) reported poor knowledge about breast cancer's risk factors. Few participants recognized overweight and obesity (34.9%), lack of breastfeeding (28.3%), and low consumption of fruits and vegetables (43.5%) as contributors to the disease Hussain *et al.*, (2022). Moreover, another study in Oman revealed that out of the total of one hundred and eighty-nine participants, 80% had information of breast cancer (*Chattu, Kumary and*

Bhagavathula, 2018). Participants had better knowledge of symptoms but less knowledge about risk factors (*Chattu, Kumary and Bhagavathula, 2018*).

A recent mixed-methods study conducted among adolescents and young adults with breast cancer in Nigeria revealed that 72% of participants lacked knowledge of early symptoms and signs of breast cancer, while 41% could not name a single risk factor when asked unprompted (*Ntekim et al., 2025*). This study further demonstrated that although 85% of young women knew that a breast lump was a possible sign of breast cancer, their knowledge of other critical early warning signs remained severely limited (*Ntekim et al., 2025*). The research identified that only 15.2% of participants suspected their initial symptoms could indicate breast cancer, while 43.5% were completely unsure about the significance of their symptoms, and 41.3% dismissed them as minor or non-serious (*Ntekim et al., 2025*).

In the Ghanaian context specifically, research among secondary school students in the Tamale Metropolis of Ghana revealed that 88.7% of students showed moderate to high levels of breast cancer awareness, while only 11.3% demonstrated low levels of awareness (*Boateng et al., 2025*). Interestingly, a significant majority of students (72.5%) disagreed with the statement that breast cancer can spread to other parts of the body, while 22.7% agreed (*Boateng et al., 2025*).

2.8 Sources of Information on Breast Cancer Among Young Females

A study among young women in the United Arab Emirates revealed that the main source of information about breast cancer was social media (74.7%), such as Facebook, Twitter, and Instagram (*Rahman et al., 2019*). Additionally, the main source of information about BSE was social media (57.2%), followed by health professionals (34.9%) (*Rahman et al., 2019*).

Research conducted among Nigerian university students revealed that social media platforms served as the primary source of breast cancer information for 56.9% of respondents, significantly

outpacing traditional educational channels (*Ekpunobi et al., 2025*). Schools and universities represented the second most common information source at 51.1%, while healthcare professionals, despite their clinical expertise, were cited by only 36.5% of students as primary information sources (*Ekpunobi et al., 2025*).

Similarly, in southwestern Nigeria, the major sources of breast cancer and breast self-examination information were television, health workers and internet (*Effiong, Afolabi and Chinedu, 2023*).

In Ghana specifically, research examining communication channels for breast cancer screening awareness revealed that mass media serves as the most common source of information, with 86 participants (44.8%) identifying mass media as their primary information source (*Dzidzornu et al., 2024*). Within the mass media category, radio emerged as the highest subcategory, representing 34 participants (39.5%) of those who relied on mass media for breast cancer information (*Dzidzornu et al., 2024*).

2.9 Factors Influencing Awareness and Knowledge of Breast Cancer

Multivariate logistic regression analysis from a study in rural southwest China established a statistically significant correlation (all $P < 0.05$) between breast cancer awareness and three key factors: educational level, contraceptive use, and a prior history of breast disease (*Zhu et al., 2024*). The data indicated that having a history of breast disease was positively associated with awareness (Odd ratio (OR) = 1.907, 95% CI= 1.128~3.223). The most robust predictor, however, was educational level, with the highest odds ratios for awareness observed in women who had attained a junior college education or above (OR) = 5.536, 95% CI = 1.898 ~16.148) (*Zhu et al., 2024*).

Another study by (*Zhang and Lu, 2022*) in Western Yuhuan revealed via multiple linear regression analysis that educational grade was the most significant influential factor underlying the level of

knowledge female college students had with regards to the treatment of breast cancer ($P < 0.05$) (Zhang and Lu, 2022).

Moreover, evidence from Qatar confirms that awareness of breast cancer was significantly related to education level, and receipt of information about breast cancer and/or BCS from a variety of sources, particularly doctors and the media (Donnelly *et al.*, 2015).

Similarly, a study in Lesotho identified four key factors associated with breast cancer awareness: education level, media exposure (radio and print), and wealth status (Afaya *et al.*, 2023). Women with higher educational attainment were significantly more likely to be aware of breast cancer compared to those with no formal education [AOR = 12.56; 95% CI: 4.35–36.28]. Media exposure also played a role; those who listened to the radio at least once a week [AOR = 1.96; 95% CI:

1.63–2.37] or read newspapers or magazines less than once a week [AOR = 1.91; 95% CI: 1.48–2.46] were more likely to be aware than those with no such exposure (Afaya *et al.*, 2023).

Additionally, women in the richest wealth quintile had higher awareness compared to those in the poorest quintile [AOR = 2.55; 95% CI: 1.67–3.9] (Afaya *et al.*, 2023).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter outlines the methodological approach employed in this research study. It details the study design, study site, population, sampling techniques, data collection methods, data handling procedures, statistical analysis, ethical considerations, and expected outcomes. The methodology has been carefully structured to ensure the reliability, validity, and reproducibility of the findings, while adhering to ethical research principles and addressing the study's objectives effectively.

3.2 Research Methods and Design

This investigation utilized a quantitative, cross-sectional study design to systematically assess the awareness and knowledge levels of the female student population. The cross-sectional approach was deemed particularly suitable for this research because it facilitates the simultaneous collection of data at a single temporal point, thereby furnishing a representative snapshot of the current knowledge, attitudes, and relevant practices within the defined target group (*Wang and Cheng, 2020*). This design enables the examination of multiple variables simultaneously while maintaining cost-effectiveness and time efficiency (*Setia, 2016*).

3.3 Data Collection Techniques and Tools

Data was collected using a validated structured questionnaire developed in consultation with academic supervisor, based on the study objectives and existing literature (*Manortey and Agyemang, 2018*) and administered via Kobo Collect, a reliable mobile tool for real-time data collection in field settings (*UN-OCHA, 2024*). The questionnaire included sections on sociodemographic characteristics of participants, awareness and knowledge of breast and cervical

cancer, attitudes and preventive practices regarding breast and cervical cancer, as well as barriers and facilitating factors influencing access to screening and preventive healthcare services.

3.4 Study Setting

The study was conducted at Akwamuman Senior High School, located in the Asuogyaman District of Ghana. This school was selected due to its accessibility, the diversity of its student population, and its representation of female adolescents within the district. The Asuogyaman District is situated in the Eastern Region of Ghana, characterized by its semi-urban population making it a suitable context for exploring awareness and knowledge of breast and cervical cancer among young women.

3.5 Study Population

The study population comprised female students enrolled at Akwamuman Senior High School. This population represents adolescent and young adult females.

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion Criteria:

- Female students currently enrolled at Akwamuman Senior High School
- Students who provide informed consent/assent (and parental consent where applicable)
- Students available during the study period and are willing to complete the survey questionnaire

3.6.2 Exclusion Criteria:

Students were excluded from the study if they are male, unable to comprehend the questionnaire, unwilling or unable to provide informed consent/assent, absent during the data collection period, or have known medical conditions that may impair their ability to participate.

3.7 Study Variables

3.7.1 Dependent Variables

A dependent variable is the outcome of interest for a study (*National Library of Medicine, 2025*).

The primary dependent variables in this study are the levels of knowledge and awareness of breast and cervical cancer.

3.7.2 Independent Variables

The independent variables are the factors that may influence the interest for a study (*National Library of Medicine, 2025*). These primarily include demographic characteristics such as age, class (SHS level), academic programme, religion, and ethnic group. Other independent variables include exposure to sources of information and participation in health-related programs or workshops.

3.8 Sampling

A stratified random sampling technique was employed to ensure proportional representation across all academic years. Stratification was based on academic levels (SHS 1, 2, 3) and courses offered. Following stratification, a simple random sampling method was used to select participants from each stratum. The sample size was calculated using the Cochran formula (*Snedecor and Cochran, 1989*) with a 95% confidence interval and 5% margin of error:

$$Z^2 \times p \times (1 - p)$$

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

where:

n = required sample size
z = reliability co-efficient (1.96 for 95% confidence interval)
p = estimated prevalence of adequate cancer knowledge
e = margin of error (5% or 0.05)

Based on Manortey and Agyemang's study (*Manortey and Agyemang, 2018*), the cervical cancer awareness rate (p) is approximately 63% (0.63). Using a 95% confidence level ($Z = 1.96$) and a margin of error of 5% (0.05), the sample size was calculated as follows:

$$n = \frac{(1.96)^2 \times (0.63) \times (1 - 0.63)}{(0.05)^2}$$

$$\frac{8416 \times (0.63) \times (0.37)}{0.0025} \quad 3.$$

$$n = = \mathbf{358}$$

Adjusting for a 10% non-response rate (36), the final sample size

$$= 358 + 36 = 394 \text{ participants}$$

The total number of female students at Akwamuman Senior High School is 500. The proportional allocation of the sample size was calculated using:

Number Of Students Per Grade/Course

$$n = \frac{\text{Number Of Students Per Grade/Course}}{\text{Total Number of Female Students in The School}} \times \text{Population Sample Size}$$

Total Number of Female Students in The School

Table 1. Proportional Allocation by Class

Class	Student Population	Proportional Sample
SHS 1	175	$(150 / 500) \times 394 = 138$
SHS 2	165	$(180 / 500) \times 394 = 130$
SHS 3	160	$(170 / 500) \times 394 = 126$

Total	500	394
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Source: Akwamuman Senior High School

Table 2. Proportional Allocation by Courses Offered

Course	SHS 1 Sample	SHS 2 Sample	SHS 3 Sample
General Science	$(25/175) \times 138 = 20$	$(20/165) \times 130 = 16$	$(15/160) \times 126 = 12$
General Arts	$(50/175) \times 138 = 39$	$(50/165) \times 130 = 39$	$(40/160) \times 126 = 32$
Business	$(35/175) \times 138 = 28$	$(35/165) \times 130 = 28$	$(30/160) \times 126 = 24$
Home Economics	$(30/175) \times 138 = 24$	$(30/165) \times 130 = 24$	$(30/160) \times 126 = 24$
Visual Arts	$(15/175) \times 138 = 12$	$(20/165) \times 130 = 16$	$(25/160) \times 126 = 20$
Agriculture	$(20/175) \times 138 = 16$	$(10/165) \times 130 = 8$	$(20/160) \times 126 = 16$
Total	138	130	126

Source: Akwamuman Senior High School

3.9 Pretesting

Pretesting was conducted with 10% of the intended sample size at a different secondary school with similar characteristics that is not part of the study site to validate the questionnaire and assess its reliability. This process helped to identify potential issues with the clarity, relevance, and structure of the questions. Feedback from the pretest was used to refine the questionnaire to ensure it was understandable and contextually appropriate.

3.10 Data Handling

To ensure the confidentiality and security of participant data, all responses were anonymized, and no personally identifiable information was collected. Data collected through the KoboCollect application was encrypted and stored on password-protected devices. Once uploaded to a secure server, the data was accessible only to authorized members of the research team. Backups of the data was stored to prevent data loss. The collected data will be archived for a stipulated duration of five (5) years to facilitate future reference and verification checks. Prior to analysis, a data cleaning protocol was executed to systematically identify, verify, and correct any anomalies, inconsistencies, or missing values within the dataset, thereby ensuring data quality and integrity

3.11 Data Analysis

Data analysis was conducted using STATA version 18. Descriptive statistics was used to summarize participants' demographics and responses to questions on key variables, calculating frequencies and percentages for categorical variables and means, medians, and standard deviations for continuous variables. The next analyses centered around awareness and knowledge levels of breast and cervical cancer which were assessed using composite scores derived from multiple indicators within the survey. Each dependent variable (awareness and knowledge) was measured using several items based on students' responses to factual questions about causes, symptoms, prevention, and treatment of breast and cervical cancer. For breast cancer, the awareness score was

computed based on three key questions. Each correct or affirmative response was scored as one (1), and incorrect or unknown responses were scored as zero (0). The total breast cancer awareness score, therefore, ranged from 0 to 3. A median split approach was used to categorize respondents into two levels: “Poor Awareness” (scores below the median) and “Good Awareness” (scores equal to or above the median). The breast cancer knowledge score was derived from responses to 12 items covering areas such as risk factors, common myths, symptoms, prevention strategies, and treatment options. Each correct response was scored as one (1), and the total raw score was standardized to a 0–20 scale. Again, a median split was applied to classify respondents as having “Poor Knowledge” or “Good Knowledge”. Similarly, for cervical cancer, the awareness score was based on three items. The maximum awareness score was 3, and categorization followed the same median split strategy. The cervical cancer knowledge score was calculated using 14 indicators, which included knowledge of risk factors, symptoms, prevention, and treatment-related knowledge. Each accurate answer received a score of one (1), and the final score was standardized to a scale of 0 to 20. Classification into “Poor Knowledge” and “Good Knowledge” categories was based on the calculated median score. Inferential statistics, including chi-square tests and logistic regression, was applied to assess associations between variables. Chi-square tests were used to examine associations between variables, and logistic regression analysis was performed to identify predictors of cancer awareness and preventive practices (at 95% confidence intervals). A p-value of <0.05 was considered statistically significant. Results are presented in tables and charts for clarity and ease of interpretation.

3.12 Ethical Consideration

Ethical approval was obtained from the Institutional Review Board of Ensign Global University. Approval letters were obtained from the Asuogyaman District Health Directorate and the Headmistress of Akwamuman Senior High School. Informed consent and Assent form was

obtained from all participants and their guardians where applicable. Participation was voluntary, and confidentiality was maintained throughout the study. Data was used solely for research purposes, and participants' right to withdraw at any time was respected without consequences.

3.13 Limitations of Study

While this study provides valuable insights into the awareness and knowledge of breast and cervical cancer among students, certain limitations must be acknowledged. Firstly, the crosssectional design limits the ability to establish causal relationships between variables. Secondly, the use of self-administered questionnaires may have introduced response bias, including social desirability bias and recall bias, particularly in questions requiring prior knowledge or personal health practices. Additionally, the study sample was limited to female students at Akwamuman Senior High School, which may affect the generalizability of the findings to other populations or regions. Lastly, although efforts were made to ensure accurate responses, the potential for misinterpretation of certain medical or technical terms by respondents cannot be entirely ruled out.

3.14 Assumptions

This study was based on the assumption that all participants will respond to the questionnaire honestly and to the best of their knowledge. It was also assumed that the selected sample of female students from Akwamuman Senior High School is representative of the wider student population. Furthermore, it was assumed that the students have had some exposure to health-related information which may influence their level of awareness and knowledge about breast and cervical cancer.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the findings of the study on the awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School, in the Asuogyaman District of Ghana. The results are organized according to the study's specific objectives. Descriptive statistics are first provided to summarize the demographic characteristics of the respondents, followed by analyses addressing each of the specific objectives. Both univariate and multivariate analyses are used to highlight significant patterns and associations within the data. The findings form the basis for the discussion and recommendations in the subsequent chapters.

4.2 Sociodemographic Characteristics of Respondents

A total of 394 questionnaires were administered to eligible female students of Akwamuman Senior High School. All 394 were successfully retrieved, cleaned, and used for the final analysis, yielding a 100% response rate. Table 4.1 presents the sociodemographic summary of the respondents. These 394 respondents had a mean age of 16 years ($SD = 1.17$). The age distribution revealed that the majority of participants (56.9%) fell within the 17-20 years age bracket, while 43.2% were aged between 12-16 years.

Regarding class distribution, the sample was fairly well-distributed across the three senior high school levels, with SHS 1 students comprising 36.5% of the sample, followed closely by SHS 3 students at 36.3% and SHS 2 students representing 27.2% of the respondents.

The distribution of courses of study revealed a predominant enrollment in General Arts, which accounted for more than half of the respondents (52.5%,). Home Economics students constituted

17.5% of the sample, while General Science students represented 14.5%. These are followed by Visual Arts students (9.4%), Business students (5.3%), as well as Agriculture students who represented the smallest proportion at 0.8%.

Religious affiliation among respondents was predominantly Christian, with 87.8% identifying as Christians. Islamic adherents constituted 10.9% of the sample, while those practicing African Traditional Religion represented a minimal 1.3%. As for ethnic composition, Ewe ethnic group represented the largest proportion at 31.7%, followed by Akan at 28.7%, and Ga-Dangme at 23.4%. The Mole-Dagbon ethnic group comprised 4.8%, while Guan represented 3.0%. Other ethnic groups (including Krobo, Wa, Dagomba, Efutu, Chamba, Ga, Hausa, Busanga, Fulani, British, Yoruba) collectively accounted for 8.4% of the respondents.

Table 4.1: Sociodemographic Characteristics of Respondents

Variables	Frequency (N=394)	Percentages (%)
Mean age: 16.76 ± 1.17		
Age groups (years)		
12 – 16	170	43
17 – 20	224	56
Class		
SHS 1	144	36

SHS 2	107	27
SHS 3	143	36
Course of Study		
Agriculture	3	0.8
Business	21	5.3
General Arts	207	52.5
General Science	57	14.5
Home Economics	69	5
Visual Arts	37	17.5
Christianity	346	1.3
Religion		9.4
		87.8
African Traditional Religion	43	10.9
Ethnic Group		
Akan	113	28.7
Ewe	125	31.7
Ga-Dangme	92	23.4
Guan	12	3.0
Mole-Dagbon	19	4.8
Other	33	8.4

Source: Field Survey, 2025

4.3 Awareness of Breast Cancer among Respondents

Table 4.2 and 4.3 shows an overview of breast cancer awareness among female students at Akwamuman Senior High School. An overwhelming majority of respondents (97.2%) reported having heard about breast cancer before, with only 2.8% indicating no prior knowledge of the condition. Regarding formal education about breast cancer in schools, the majority of participants (69.5%) reported receiving occasional formal education about breast cancer in school, while 22.8% indicated regular exposure to such education. Only 7.6% reported never receiving any formal education about breast cancer in school.

Awareness of breast cancer initiatives showed encouraging results, with 85.5% of participants correctly identifying October as the globally dedicated breast cancer awareness month.

However, knowledge gaps were evident, as 8.1% incorrectly identified January, and 6.4% selected November as the awareness month.

Analysis of information sources reveals a varied approach to breast cancer education among participants. Healthcare providers emerged as the most frequently cited source of information, with 55.6% of respondents indicating they obtain breast cancer information from this source. School and teachers constituted another significant information source, utilized by 45.7% of participants. Media platforms, including television, radio, internet, and social media, served as information sources for 37.8% of respondents. Notably, family and friends represented the least utilized source, with only 14.0% of participants relying on this informal network for breast cancer information.

Table 4.2: Responses to Questions on Awareness of Breast Cancer

Questions	Frequency (N)	Percentages (%)
Heard of breast cancer?		
Yes	383	97.2
No	11	2.8
Have you received formal education about breast cancer in school?		
Yes, regularly	90	22.8
Yes, occasionally	274	69.5
No, never	30	7.6
Which month is dedicated as breast cancer awareness month globally?		
January	32	8.1
October	337	85.5
November	25	6.4

Source: Field Survey, 2025

Table 4.3: Sources of information about breast cancer (multiple response)

Questions	Yes	No	Total
Where do you get information about breast cancer?	N (%)	N (%)	N (%)
School/Teachers	179 (45.7)	213 (54.3)	392 (100.0)
Healthcare providers	218 (55.6)	174 (44.4)	392 (100.0)
Family/Friends	55 (14.0)	337 (86.0)	392 (100.0)
Media (TV, radio, internet, social media)	148 (37.8)	244 (62.2)	392 (100.0)

Source: Field Survey, 2025

* Two persons did not respond and thus total respondents for sources of information equals 392.

4.3.1 Overall Awareness Levels of Breast Cancer

Overall, a majority of respondents (~77%) demonstrated "Good Awareness" of breast cancer while the remaining ~23% were categorized as having "Poor Awareness."

The median cut off point used was 3. A score greater than (≥ 3) was considered as "Good Awareness" and a score less than (≤ 3) was considered "Poor Awareness"

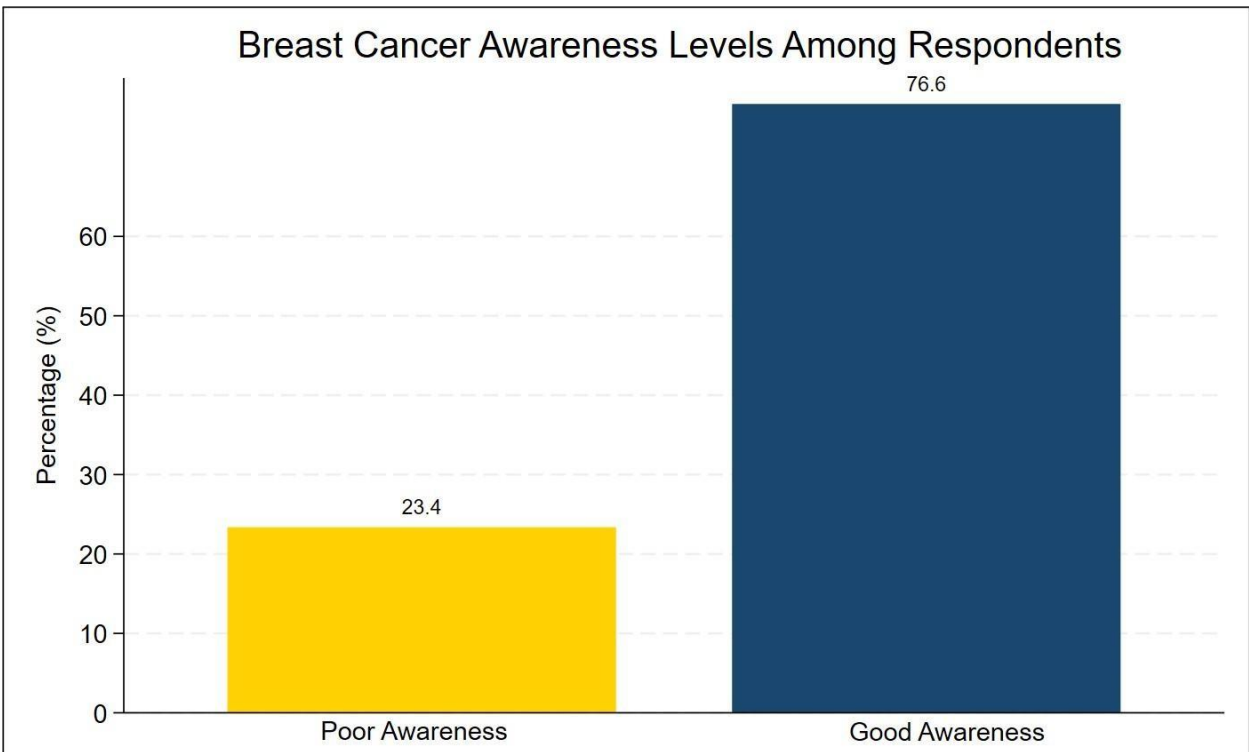


Figure 4.3.1: *The levels of breast cancer awareness among respondents*

4.4 Knowledge of Breast Cancer among Respondents

Table 4.4 and 4.5 shows an overview of breast cancer knowledge among female students at Akwamuman Senior High School. With regards to basic knowledge about breast cancer prevention, a substantial majority of participants (72.8%) correctly identified that breast cancer can be prevented, while 22.8% expressed uncertainty and only 4.3% incorrectly believed it cannot be prevented. However, concerning misconceptions were evident in participants' understanding of breast cancer causation. A striking 60.9% incorrectly believed that wearing tight bras can cause breast cancer, with only 20.1% correctly rejecting this myth and 19.0% expressing uncertainty. While 42.3% correctly identified lifestyle factors as risk contributors, awareness of genetic predisposition was notably lower at 22.8%. Hormonal changes as a risk factor were recognized by

38.0% of participants. Importantly, 18.7% acknowledged their lack of knowledge regarding risk factors.

The most commonly recognized symptom was the presence of a lump in the breast (59.3%), followed closely by breast pain (57.8%). However, awareness of other important symptoms was considerably lower, with only 29.8% recognizing changes in breast shape or size, and 29.5% identifying nipple discharge or bleeding as potential symptoms. Encouragingly, only 2.5% indicated complete lack of knowledge about symptoms.

Practical knowledge related to breast cancer management showed more positive outcomes. A majority of participants (69.3%) reported knowing how to perform breast self-examinations, and 62.9% were aware of treatment options for breast cancer. Among those aware of treatments, surgery was the most commonly known option (67.6%), while awareness of other conventional treatments was lower: chemotherapy (26.1%) and radiation therapy (16.2%). Notably, few participants (4.6%) mentioned traditional medicine as a treatment option.

Regarding prevention strategies, among participants who believed breast cancer could be prevented, regular screening was the most frequently cited method (72.8%), followed by healthy lifestyle practices (49.0%).

Table 4.4: Responses to questions on knowledge regarding breast cancer transmission and prevention

Questions	Frequency (N)	Percentages (%)
Can breast cancer be caused by wearing tight bras?		
Yes	240	60.9
No	79	20.1

I don't know	75	19.0
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Can breast cancer be prevented?

Yes	287	72.8
-----	-----	------

No	17	4.3
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I don't know	90	22.8
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Are you aware of any treatment options for breast cancer?

Yes	248	62.9
-----	-----	------

No	146	37.1
----	-----	------

Do you know how to perform breast self-examinations?

Yes	273	69.3
-----	-----	------

No	121	30.7
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Source: Field Survey, 2025

Table 4.5: Responses to multiple-response questions on breast cancer knowledge

Questions	Yes
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Which of the following are risk factors for breast cancer?

Genetics (family history)

89 (22.8)

Hormonal changes

148 (38.0)

Lifestyle factors (e.g., smoking, diet)	165 (42.3)
I don't know	73 (18.7)

What are the symptoms of breast cancer?

Lump in the breast	233 (59.3)
Change in breast shape or size	117 (29.8)
Pain in the breast	227 (57.8)
Nipple discharge or bleeding	116 (29.5)
I don't know	10 (2.5)

If yes, how can breast cancer be prevented?

Regular screening	260 (72.8)
Healthy lifestyle	175 (49.0)
I don't know	4 (1.1)

If yes, which treatments do you know?

Surgery	163 (67.6)
Chemotherapy	63 (26.1)
Radiation therapy	39 (16.2)
Traditional medicine	11 (4.6)
I don't know	18 (7.5)

Source: Field Survey, 2025

4.5.1 Overall Level of Knowledge of Breast Cancer

Regarding respondents' overall level of breast cancer knowledge, over half of the participants (68.3%) were categorized as having "Poor Knowledge," while only 31.7% were categorized as having "Good Knowledge."

The median cut off point of 10 was used. A score greater than (≥ 10) was considered "Poor knowledge" where a score less than (≤ 10) was considered "Good knowledge"

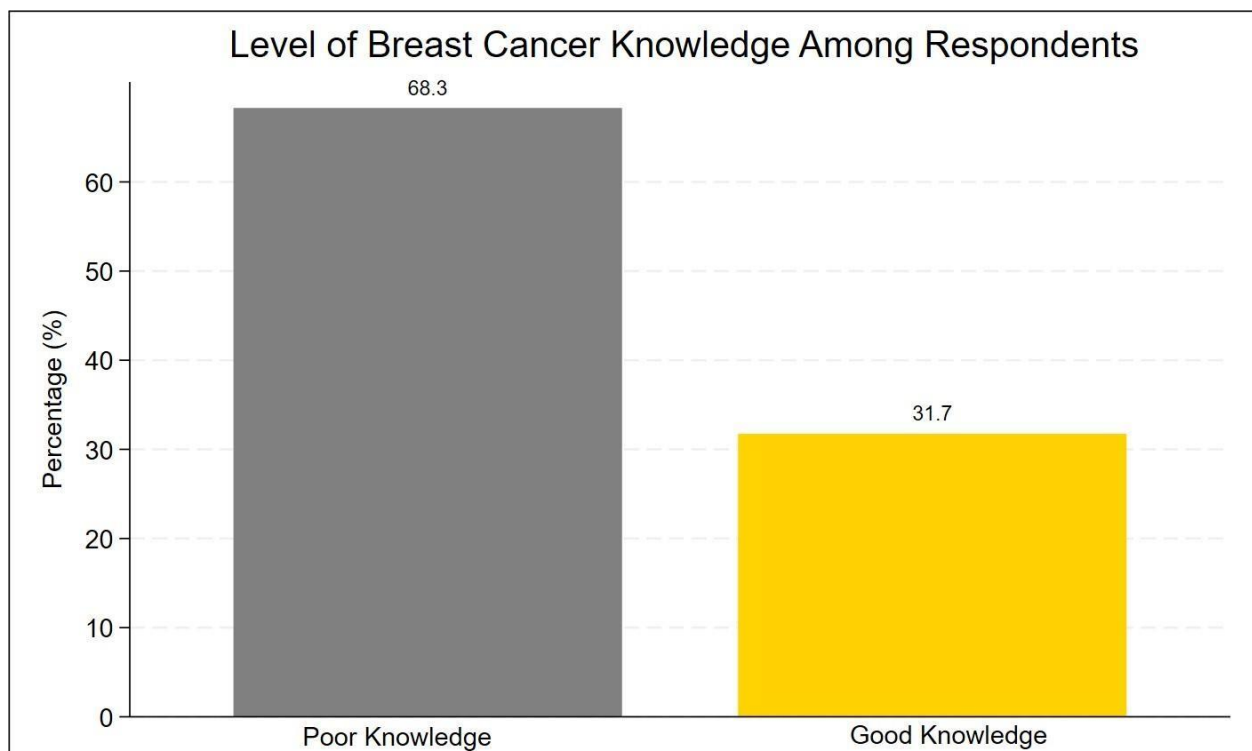


Figure 4.4.1: *The levels of breast cancer knowledge among respondents*

4.6 Awareness of Cervical Cancer among Respondents

Table 4.6 and 4.7 presents an overview of cervical cancer awareness among female students at Akwamuman Senior High School. The findings reveal varying levels of cervical cancer awareness among the study participants, with notable gaps in knowledge and education exposure. Regarding basic awareness, three-quarters of respondents (75.4%) reported having heard about cervical cancer before, while nearly one-quarter (24.6%) had no prior Awareness of the condition.

Formal educational exposure to cervical cancer information in school settings demonstrated concerning patterns. Only 14.7% of participants reported receiving regular formal education about cervical cancer in school, while approximately half (52.0%) indicated receiving such education only occasionally. Notably, one-third of respondents (33.3%) reported never receiving any formal education about cervical cancer in school.

Examination of information sources revealed that healthcare providers served as the primary source of cervical cancer information for 51.3% of participants, representing the most frequently cited source. Media platforms, including television, radio, internet, and social media, constituted the second most common information source at 40.0%. School and teachers were identified as information sources by 36.6% of respondents, while family and friends represented the least utilized source at only 9.3%.

Regarding cervical cancer awareness initiatives, participants demonstrated poor awareness of global awareness campaigns. Less than half of respondents (43.4%) incorrectly identified November as the dedicated cervical cancer awareness month globally. Approximately only onethird (32.7%) correctly identified January as the dedicated cervical cancer awareness month globally, while nearly one-quarter (23.9%) selected February.

Table 4.6: Responses to questions on awareness level of cervical cancer

Questions	Frequency (N)	Percentages (%)
Heard of cervical cancer?		
Yes	297	75.4
No	97	24.6

Have you received formal education about cervical cancer in school?

Yes, regularly	58	14.7
Yes, occasionally	205	52.0
No, never	131	33.3

Which month is dedicated as cervical cancer awareness month globally?

February	94	23.9
January	129	32.7
November	171	43.4

Source: Field Survey, 2025

The median score value for the level of cervical cancer awareness used was 2.

Table 4.7: Sources of information about cervical cancer (multiple responses)

Questions	Yes
	N (%)
Where do you get information about cervical cancer?	
School/Teachers	142 (36.6)
Healthcare providers	199 (51.3)

Family/Friends	36 (9.3)
Media (TV, radio, internet, social media)	155 (40.0)

Source: Field Survey, 2025

4.5.1 Overall Level of Awareness of Cervical Cancer

Overall, when assessing awareness of cervical cancer, the results revealed a moderate distribution, with 68.27% of students categorized as having "Good Awareness," and 31.73% falling under "Poor Awareness".

The median value used was 2 and so any score above (≥ 2) was considered "Good Awareness" where any score below (≤ 2) was considered "Poor Awareness".

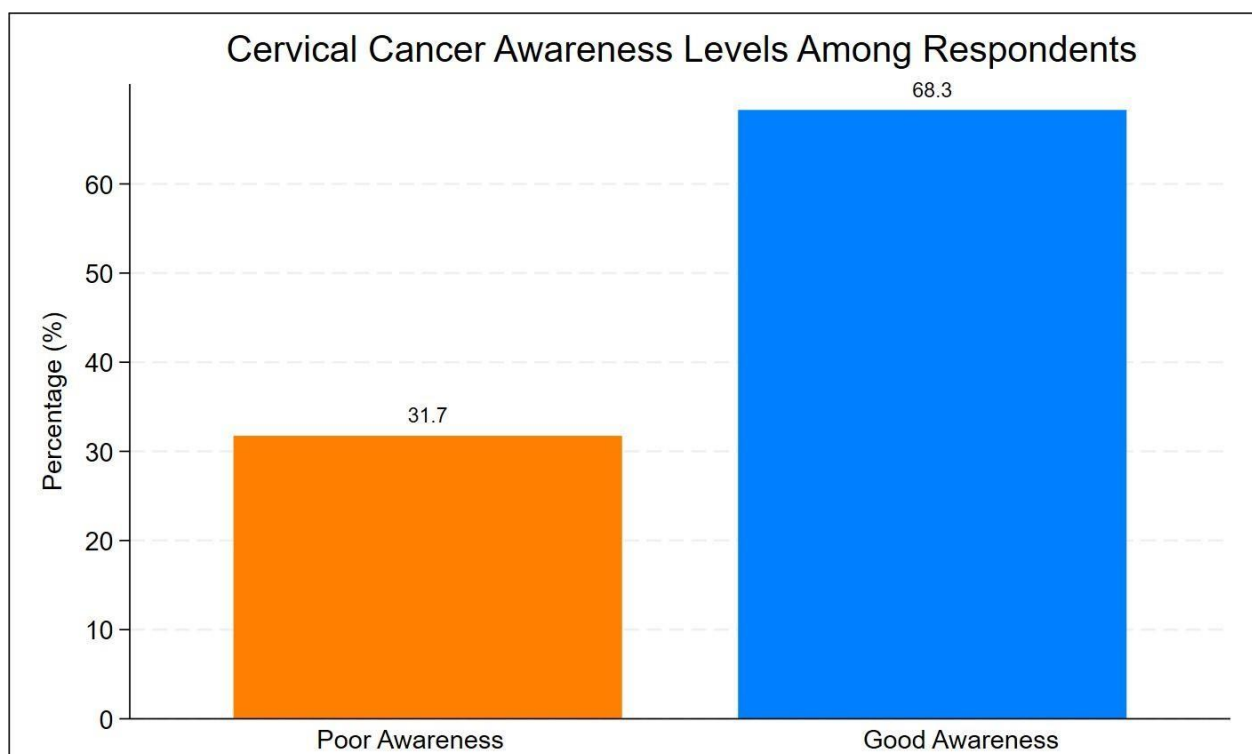


Figure 4.5.1: *The levels of cervical cancer awareness among respondents*

4.7 Knowledge level of Cervical Cancer among Respondents

Table 4.8 and 4.9 presents an overview of cervical cancer awareness among female students at Akwamuman Senior High School. Regarding preventability, majority of respondents (72.8%) correctly identified that cervical cancer can be prevented, while 22.8% were uncertain and only 4.3% incorrectly believed it cannot be prevented.

However, awareness of specific preventive measures showed concerning gaps. Knowledge of the HPV vaccine, a critical primary prevention tool, was limited, with only 32.5% of participants being aware of its existence and role in cervical cancer prevention. Similarly, awareness of cervical cancer screening through Pap smears was suboptimal, with 42.4% reporting awareness while 57.6% lacked knowledge about this essential secondary prevention method.

Among the established risk factors, Human Papillomavirus (HPV) infection and multiple sexual partners were each recognized by only 30.3% of participants. Poor hygiene was identified by 29.0% of respondents, though this represents a misconception as poor hygiene is not a direct risk factor for cervical cancer. Notably, smoking, a well-established risk factor, was recognized by merely 9.4% of participants, while early sexual activity was identified by only 12.0%. Others responses (26.2%) stated that they did not know about any risk factor of cervical cancer.

Symptom recognition presented similar challenges. Pain during intercourse was identified by 29.5% of participants, pelvic pain by 24.6%, and vaginal discharge with bad odor by 24.9%. A higher percentage of participants selected "I don't know" for symptoms (31.8%) indicating a considerable knowledge gap.

Among those who correctly identified cervical cancer as preventable, knowledge of prevention methods varied considerably. Regular screening was recognized by 57.2% of this subset, and healthy lifestyle by 56.1%. However, vaccination as a prevention method was identified by only

17.3%, consistent with the low overall awareness of the HPV vaccine. The minimal "I don't know" responses (3.2%) in this category suggests that those who understand cervical cancer's preventability generally have some knowledge of prevention methods.

Table 4.8: Responses to questions on knowledge regarding cervical cancer transmission and prevention

Questions	Frequency (N)	Percentages (%)
Can cervical cancer be prevented?		
Yes	287	72.8
No	17	4.3
I don't know	90	22.8
Do you know about the HPV vaccine, which prevents cervical cancer?		
Yes	128	32.5
	266	67.5
No		
Are you aware of cervical cancer screening (Pap smear)?		
Yes	167	42.4
	227	57.6

No

Source: Field Survey, 2025

Table 4.9: Responses to multiple-choice questions on cervical cancer knowledge

Questions	Yes
Which of the following are risk factors for cervical cancer?	
Human Papillomavirus (HPV) infection	119 (30.3%)
Multiple sexual partners	119 (30.3%)
Poor hygiene	114 (29.0%)
Smoking	37 (9.4%)
Early sexual activity	47 (12.0%)
I don't know	103 (26.2%)
What are the symptoms of cervical cancer?	
Abnormal vaginal bleeding	97 (24.5%)
Pain during intercourse	115 (29.5%)
Pelvic pain	96 (24.6%)
Vaginal discharge with a bad odor	97 (24.9%)
I don't know	124 (31.8%)

If yes, how can cervical cancer be prevented?

Regular screening	159 (57.2%)
Healthy lifestyle	156 (56.1%)
Vaccination	48 (17.3%)
I don't know	9 (3.2%)

Source: Field Survey, 2025

4.6.1 Overall Level of Knowledge of Cervical Cancer

Regarding respondents' overall level of knowledge of cervical cancer, 58.12% of students were found to have "Good Knowledge," whereas 41.88% exhibited "Poor Knowledge."

The median value of 5.7 was used. Where any score above (≥ 5.7) was considered "Good Knowledge", and any score below (≤ 5.7) was considered "Poor Knowledge"

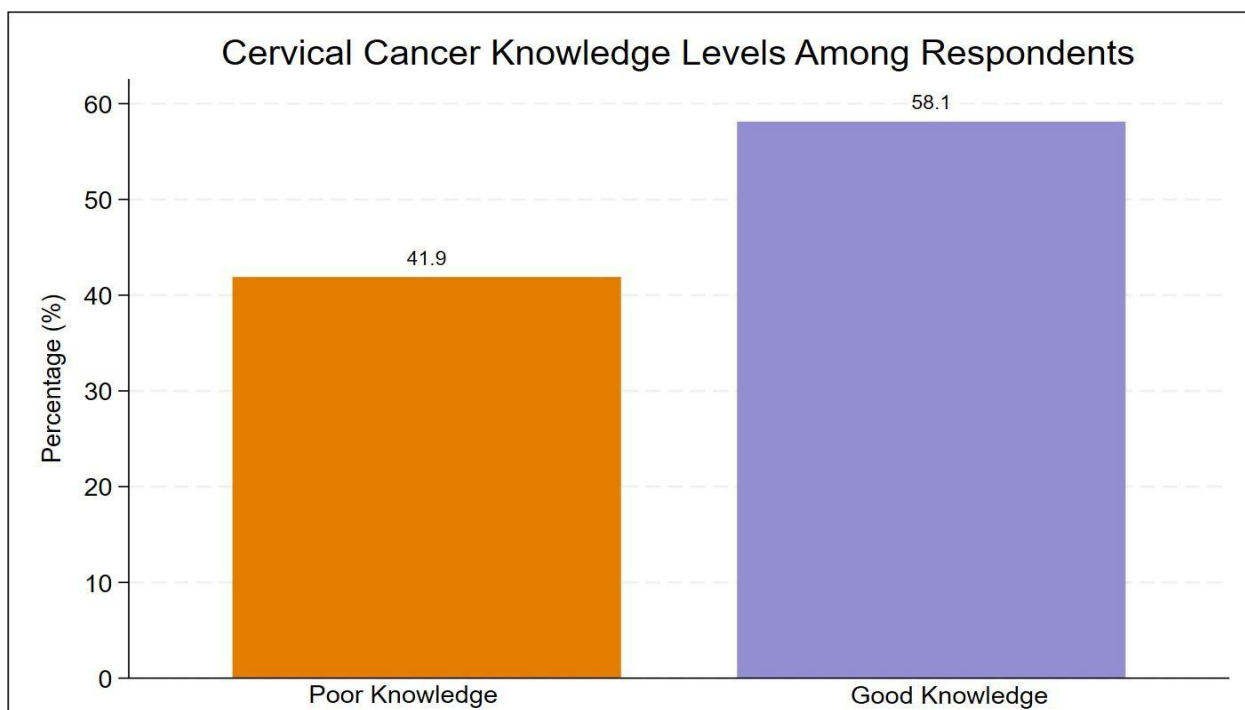


Figure 4.6.1: The levels of cervical cancer knowledge among respondents

4.8 Bivariate Analysis of Factors Influencing Breast Cancer Knowledge Levels

Table 4.11 presents an overview of bivariate analysis examining the associations between sociodemographic factors, breast cancer awareness levels, and knowledge levels among respondents. Chi-square tests were employed to assess statistical significance, with results revealing key patterns in the distribution of knowledge across different subgroups.

No significant association was found between age groups and breast cancer knowledge ($\chi^2=2.30$, $p=0.130$). However, a higher proportion of respondents aged 12–16 years (72.35%) exhibited poor knowledge compared to those aged 17–20 years (65.18%), suggesting a possible trend toward improved knowledge with increasing age, though not statistically significant.

A strong association was observed between class level and knowledge ($\chi^2=22.89$, $p<0.001$). Students in SHS 1 had the highest proportion of poor knowledge (81.94%),

while SHS 2 students demonstrated the most balanced distribution (54.21% poor vs. 45.79% good).

Significant variations were noted across courses ($\chi^2=22.81$, $p<0.001$). General Arts students had the highest proportion of poor knowledge (76.81%), whereas Business and General Science students exhibited relatively better knowledge (52.38% and 52.63% good knowledge, respectively).

Neither religion ($\chi^2=0.96$, $p=0.620$) nor ethnicity ($\chi^2=4.92$, $p=0.426$) showed significant associations with knowledge levels. However, minor variations existed. For instance, respondents from the Mole-Dagbon ethnic group had the lowest proportion of poor knowledge (52.63%), though this finding was not statistically robust.

A significant association emerged between awareness and knowledge ($\chi^2=5.53$, $p=0.019$). Respondents with good awareness were more likely to have good knowledge (34.77%) compared to those with poor awareness (21.74%).

Table 4.11: Bivariate Analysis of Factors Influencing Breast Cancer Knowledge Levels

Variables	Knowledge Levels (N=394)		χ^2 (p-Value)
	Poor N (%)	Good N (%)	
Age groups (years)			2.30 (0.130)
12 – 16	123 (72.35)	47 (27.65)	
17 – 20	146 (65.18)	78 (34.82)	
Class			22.89 (<0.001)
SHS 1	118 (81.94)	26 (18.06)	
SHS 2	58 (54.21)	49 (45.79)	
SHS 3	93 (65.03)	50 (34.97)	
Course of Study			22.81 (<0.001)
Agriculture	2 (66.67)	1 (33.33)	
Business	10 (47.62)	11 (52.38)	
General Arts	159 (76.81)	48 (23.19)	
General Science	27 (47.37)	30 (52.63)	
Home Economics	47 (68.12)	22 (31.88)	
Visual Arts	24 (64.86)	13 (35.14)	
Religion			0.96 (0.620)
African Traditional	4 (80.00)	1 (20.00)	
Christianity	238 (68.79)	108 (31.21)	

Islam	27 (62.79)	16 (37.21)	
Ethnic Group			4.92 (0.426)
Akan	82 (72.57)	31 (27.43)	
Ewe	89 (71.20)	36 (28.80)	
Ga-Dangme	59 (64.13)	33 (35.87)	
Guan	7 (58.33)	5 (41.67)	
Mole -Dagbon	10 (52.63)	9 (47.37)	
Other	22 (66.67)	11 (33.33)	5.53 (0.019)
Breast Cancer Awareness Level			
Poor Awareness	72 (78.26)	20 (21.74)	
Good Awareness	197 (65.23)	105 (34.77)	

Source: Field Survey, 2025

4.10 Bivariate Analysis of Factors Influencing Cervical Cancer Knowledge Levels

The bivariate analysis examined the association between cervical cancer knowledge levels and sociodemographic factors, as well as awareness levels, among respondents. Chi-square tests were employed to assess statistical significance, with results presented in Table 4.13.

No significant association was found between age groups (12–16 vs. 17–20 years) and cervical cancer knowledge levels ($\chi^2 = 0.1388$, $p = 0.709$). Similarly, class level (SHS 1, SHS 2, SHS 3) did not significantly influence knowledge ($\chi^2 = 0.3346$, $p = 0.846$), suggesting that educational progression within senior high school did not markedly alter comprehension of cervical cancer.

While variations existed across courses, no statistically significant differences were observed ($\chi^2 = 6.6145$, $p = 0.251$). Business students exhibited the highest proportion of poor knowledge (57.14%), whereas Agriculture students demonstrated full awareness (100%). However, small sample sizes in some categories may limit generalizability.

Additionally, religious affiliation showed no significant impact ($\chi^2 = 0.0074$, $p = 0.996$), with similar knowledge distributions across Christianity, Islam, and African Traditional Religion. Also, ethnic background did not significantly predict knowledge levels ($\chi^2 = 5.1196$, $p = 0.401$), though Ga-Dangme respondents had the highest proportion of good knowledge (66.30%).

Notably, cervical cancer awareness level was significantly associated with knowledge ($\chi^2 = 7.3513$, $p = 0.007$). Respondents with good awareness were more likely to possess good knowledge (77.60%) compared to those with poor awareness (63.94%).

Table 4.11: Bivariate Analysis of Factors Influencing Cervical Cancer Knowledge Levels

Variables	Knowledge Levels (N=394)		χ^2 (p-Value)
	Poor N (%)	Good N (%)	
Age groups (In years)			0.1388 (0.709)
12 – 16	73 (42.94)	97 (57.06)	
17 – 20	92 (41.07)	132 (58.93)	
Class			0.3346 (0.846)
SHS 1	63 (43.75)	81 (56.25)	

SHS 2	44 (41.12)	63 (58.88)	
SHS 3	58 (40.56)	85 (59.44)	
Course of Study			6.6145 (0.251)
Agriculture	0 (0.00)	3 (100.00)	
Business	12 (57.14)	9 (42.86)	
General Arts	81 (39.13)	126 (60.87)	
General Science	24 (42.11)	33 (57.89)	
Home Economics	34 (49.28)	35 (50.72)	
Visual Arts	14 (37.84)	23 (62.16)	
Religion			0.0074 (0.996)
African Traditional	2 (40.00)	3 (60.00)	
Christianity	145 (41.91)	201 (58.09)	
Islam	18 (41.86)	25 (58.14)	
Ethnic Group			5.1196 (0.401)
Akan	49 (43.36)	64 (56.64)	
Ewe	60 (48.00)	65 (52.00)	
Ga-Dangme	31 (33.70)	61 (66.30)	
Guan	4 (33.33)	8 (66.67)	
Mole-Dagbon	7 (36.84)	12 (63.16)	
Other	14 (42.42)	19 (57.58)	
Cervical Cancer Awareness			7.3513 (0.007)
Level			

Poor Awareness	97 (36.06)	172 (63.94)
Good Awareness	28 (22.40)	97 (77.60)

Source: Field Survey, 2025

4.12 Multivariate Analysis of Factors Influencing Breast Cancer Knowledge Levels

Table 4.15 presents multivariate logistic regression analysis examining the association between breast cancer knowledge levels and key socio-demographic factors, adjusting for potential confounders. The findings revealed significant variations in knowledge levels across different subgroups, with class level and awareness emerging as the most influential predictors.

Class level exhibited the strongest association with breast cancer knowledge. Compared to SHS 1 students, those in SHS 2 had 3.30 times higher odds (AOR = 3.30, 95% CI: 1.77–6.17, $p < 0.001$) of better knowledge, while SHS 3 students showed a non-significant increase (AOR = 1.68, $p = 0.143$). This suggests that academic progression may enhance health literacy, though the effect diminishes in higher classes.

Breast cancer awareness was also a significant predictor in the crude model (COR = 1.92, $p = 0.020$), but its effect attenuated slightly in the adjusted analysis (AOR = 1.72, $p = 0.075$). This near-significant trend implies that awareness campaigns may indirectly improve knowledge, though other factors likely mediate this relationship.

Contrary to expectations, age, religion, and ethnicity showed no statistically significant associations in the adjusted model. For instance, while Mole-Dagbon ethnicity appeared influential in the crude analysis (COR = 2.38, $p = 0.086$), this association lost significance after adjustment (AOR = 2.32, $p = 0.188$). Similarly, course of study had no measurable impact, with all categories (e.g., General Science, Business) showing non-significant odds ratios.

Table 4.15: Multivariate Analysis of Factors Influencing Breast Cancer Knowledge Levels

Variables	COR (95% CI)		p-value	AOR (95% CI)		p-value
Age groups (in years)						
12–16 years	Ref	-	-	Ref	-	-
17–20 years	1.40	0.91 – 2.16	0.130	0.95	0.53 – 1.69	0.856
Class						
SHS 1	Ref	-	-	Ref	-	-
SHS 2	3.83*	2.17 – 6.78	<0.001*	3.30*	1.77 – 6.17	<0.001*
SHS 3	2.44*	1.41 – 4.21	0.001*	1.68	0.84 – 3.36	0.143
Course of Study						
General Arts	Ref	-	-	Ref	-	-
Business	2.86	0.17 – 28.14	0.544	2.25	0.16 – 31.18	0.546
General Science	2.22	0.19 – 25.91	0.524	3.29	0.26 – 40.94	0.354
Home Economics	0.94	0.08 – 10.88	0.958	1.50	0.12 – 18.50	0.753
Visual Arts	1.08	0.09 – 13.11	0.950	1.99	0.15 – 25.93	0.601
Religion						
Christianity	Ref	-	-	Ref	-	-
Islam	2.37	0.24 – 23.10	0.458	3.57	0.33 – 39.15	0.297

African Religion	Traditional	-	(omitted)	-	-	(omitted)	-
Ethnic group							
		Ref	-	-	Ref	-	-
Akan		1.07	0.61 – 1.88	0.815	0.95	0.51 – 1.75	0.862
Ewe		1.48	0.82 – 2.68	0.196	1.24	0.66 – 2.35	0.500
Ga-Dangme		1.89	0.56 – 6.40	0.307	1.19	0.32 – 4.44	0.792
Guan		2.38	0.88 – 6.41	0.086	2.32	0.66 – 8.10	0.188
Mole-Dagbon							
Other		1.32	0.57 – 3.04	0.511	1.25	0.48 – 3.24	0.642*

Breast Cancer Awareness Level

Poor	Ref	-	-	Ref	-	-
Good Awareness	1.92*	1.11 – 3.32	0.020*	1.72	0.95 – 3.12	0.075*

Note: Asterisks () indicate statistically significant results. "Ref" indicates reference category. "" Indicates data not reported or not applicable. OR = Odds Ratio, AOR = Adjusted Odds Ratio, CI = Confidence Interval*

4.14 Multivariate Factors influencing Cervical Cancer Knowledge Levels

Table 4.17 presents results of a multivariate analysis which examined the association between cervical cancer knowledge levels and socio-demographic factors, adjusting for potential confounders. The results revealed that awareness level was the only statistically significant

predictor of knowledge (AOR = 3.42, 95% CI: 2.14–5.47, $p < 0.001$). Respondents with good awareness had 3.4 times higher odds of possessing adequate cervical cancer knowledge compared to those with poor awareness, underscoring the critical role of health education in improving understanding of the disease.

In contrast, socio-demographic variables including age, class, course of study, religion, and ethnicity, showed no significant associations with knowledge levels in either crude (COR) or adjusted (AOR) analyses.

Regarding age, adolescents aged 17–20 years had marginally lower odds of adequate knowledge (AOR = 0.89, $p = 0.667$), though this was not significant. For Class, SHS 2 and SHS 3 students exhibited near-equivalent odds to SHS 1 (reference), suggesting uniform knowledge across grade levels.

In terms of Ethnicity, while Ga-Dangme (AOR = 1.64) and Guan (AOR = 2.17) respondents showed higher odds, these trends were not statistically significant ($*p* > 0.1$), possibly due to sample size limitations. Religion and course of study also yielded non-significant estimates, with omitted categories (e.g., Agriculture, Visual Arts) reflecting collinearity or sparse data.

Table 4.17: Factors influencing Cervical Cancer Knowledge Levels

Variables	COR (95% CI)		AOR	(95% CI)	p-value
			pvalue		
Age groups (in years)	-	-	-	-	-
12–16 years	Ref		Ref		

17–20 years	1.08	0.72–1.62	0.709	0.89	0.52–1.52	0.667
Class						
SHS 1	Ref	-	-	Ref	-	-
SHS 2	1.11	0.67–1.85	0.677	0.83	0.46–1.50	0.536
	1.14	0.71–1.82	0.584	0.99	0.52–1.86	0.963
SHS 3						
Course of Study						
General Arts	Ref	-	-	Re	-	-
Agriculture	-	(omitted)	-	-	(empty)	-
Business	0.46	0.15–1.36	0.159	0.41	0.12–1.34	0.139
General Science	0.84	0.36–1.95	0.681	0.74	0.30–1.86	0.529
Home Economics	0.63	0.28–1.42	0.261	0.63	0.26–1.50	0.294
Visual Arts	-	(omitted)	-	-	(omitted)	-
Religion						
Christianity	1.00	-	-	1.00	-	-
Islam	0.93	0.14–6.12	0.936	0.62	0.08–4.75	0.642
Ethnic Group						
Akan (Ref)	Ref	-	-	Ref	-	-
Ewe	0.83	0.50–1.38	0.474	0.96	0.56–1.67	0.890

Ga-Dangme	1.51	0.85–2.66	0.159	1.64	0.90–3.01	0.108
Guan	1.53	0.44–5.38	0.506	2.17	0.58–8.20	0.252
Mole-Dagbon	1.31	0.48–3.58	0.595	1.72	0.50–5.96	0.394
Other	1.04	0.47–2.28	0.924	1.43	0.58–3.52	0.440

Cervical Cancer Awareness

Level

Poor Awareness	Ref	-	-	Ref	-	-
Good Awareness	3.30*	2.12–5.13	<0.001	3.42*	2.14–5.47	<0.001

Note: Asterisks () indicate statistically significant results. "Ref" indicates reference category. "-" indicates data not reported or not applicable. OR = Odds Ratio, AOR = Adjusted Odds Ratio, CI = Confidence Interval*

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

This chapter discusses the key findings from the study on the awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School. The results are interpreted in the context of existing literature, highlighting areas of alignment and deviation. Particular attention is given to the implications of the observed levels of awareness and knowledge, as well as the socio-demographic factors that may influence them. All discussions were done around the study's specific objectives.

5.1 Sociodemographic Characteristics

The sociodemographic profile of the respondents in this study, comprising female students from Akwamuman Senior High School, provides a crucial context for interpreting the findings on breast and cervical cancer awareness and knowledge. The analysis reveals that while certain demographic characteristics showed significant associations with knowledge levels, others did not, highlighting specific areas where educational interventions could be most impactful.

5.3 Age and Class Level: The Role of Educational Progression

The mean age of the participants was 16.76 years, well within the adolescent age range that is beginning to form health behaviors and permanent knowledge (Ackerson & Preston, 2009). Of particular interest, even though age group (12-16 versus 17-20 years) in itself was not identified as a predictor of breast or cervical cancer knowledge in the final multivariate analyses, class level was an important and strong predictor for breast cancer knowledge. SHS 2 students were 3.30 times more likely (AOR = 3.30, 95% CI: 1.77–6.17, $p < 0.001$) to have good breast cancer knowledge compared with their peers in SHS 1. This would mean that the total school experience

and adulthood gained by staying an extra year in senior high school can have a gigantic impact on health literacy. The non-significant result for the SHS 3 students, nonetheless, indicates that such a development is neither linear nor that something else influences knowledge in the third year. Such a finding aligns with studies showing that school health education can actually build up knowledge in the long run (Mabele et al., 2021). On the other hand, for cervical cancer, class level did not have any significant association, which might be because of relatively less and disorganized incorporation of cervical cancer-specific education in the school curriculum compared to breast cancer.

The area of study was the other important sociodemographic predictor of breast cancer knowledge. Students enrolled in Business and General Science had much higher knowledge compared to most (52.5%) General Arts students. From the bivariate analysis, it was found that over three-quarters (76.81%) of General Arts students had poor breast cancer knowledge. This disparity could be owed to the science-centered curriculum, which has the capacity to develop greater interest in and exposure towards health and biological courses (Adetule et al., 2022). Students of business, who could be trained in information analysis and research, are likely to be more engaged in health information seeking. The concentration of poor knowledge within General Arts students, which is a considerable cohort, indicates that there should be intensive education interventions along this specific study track.

Religious affiliation and ethnicity did not seem such powerful predictors of knowledge levels regarding either breast or cervical cancer in the adjusted models, the research also discovered. The student population was predominantly Christian (87.8%), and the most common ethnic groups were Ewe and Akan. The fact that there is no significant association suggests that, in this environment, religious and cultural backgrounds are unlikely to represent potential strong learning

barriers when it comes to cancer. This is an encouraging finding as it implies that school and public health messages can be appropriately conveyed to diverse religious and ethnic populations within the school without extensive cultural modification, at least regarding the essential information quantified in this study (Gyamfua et al., 2020).

Almost certainly the most persistent finding in both these cancers was the strong influence of overall awareness as a knowledge determinant. For breast and cervical cancer, individuals with "Good Awareness" were much more likely to possess "Good Knowledge." This was strongly manifested for cervical cancer, where good awareness increased the possibility of possessing good knowledge by over three times (AOR = 3.42, 95% CI: 2.14–5.47, $p < 0.001$). This is one of the chief principles of health promotion: creating initial awareness is an essential first step that allows one to learn more about deeper, broader information (Rogers, 2003). It suggests that efforts at simply raising the profile and debate of these cancers—through campaigns, media, and foundational education—can have a substantial cascading effect on comprehensive understanding. The sociodemographic factors of class level and course of study were key differentiators in breast cancer knowledge among the students, highlighting the influence of the educational environment and curriculum. In contrast, age, religion, and ethnicity were less influential in this specific setting.

5.3 Awareness and Knowledge level of Breast Cancer

The findings of this study revealed a high level of awareness of breast cancer among respondents, with 97.2% reporting prior knowledge of the condition. This is consistent with a descriptive study by (Godfrey, Agatha and Nankumbi, 2016) conducted in Kampala, Uganda, which revealed a high awareness of breast cancer (98.0%) among female students. Additionally, an Indonesian study also showed that the majority of female adolescents had high awareness (67.5%) of breast cancer (Pangestuti, Armini and Dewi, 2021).

Despite the high awareness levels, notable gaps in knowledge were evident. Only 31.7% of participants demonstrated "Good Knowledge" of breast cancer, while the majority (68.3%) exhibited "Poor Knowledge." This suggests that while students may be familiar with breast cancer as a concept, their understanding of its causes, symptoms, and prevention remains insufficient. This is consistent with a study by (Mohebi *et al.* 2023) conducted among female students in senior high schools in Fasa where most students were aware of the risk of breast cancer, but they were uninformed of its symptoms, risk factors, and prevention strategies,

Misconceptions, such as the belief that wearing tight bras causes breast cancer (held by 60.9% of respondents), further underscore the need for targeted educational interventions. These findings are comparable to those of (Afaya *et al.* 2024). In their systematic review on socio-cultural beliefs influencing breast cancer diagnosis and treatment in Ghana, (Afaya *et al.* 2024) identified cultural beliefs such as ancestral punishment and curses, spiritual beliefs attributing breast cancer to supernatural forces, and religious beliefs viewing it as a test from God. The respondents also documented various perceptions and beliefs concerning the etiology of breast cancer. These included notions that the disease is caused by external factors such as spider bites, extreme psychological stress, or physical trauma, alongside internal influences like infection, specific dietary factors, heredity, and overall lifestyle choices (Afaya *et al.*, 2024a).

Encouragingly, 69.3% of respondents reported knowing how to perform breast self-examinations, which is critical for early detection. This is concurrent with evidence from (Fondjo *et al.* 2018) where almost all (90.9%) of the study participants were aware of BSE. Of these, 33.0% were SHS students and 67.0% were university students (Fondjo *et al.*, 2018). However, the limited awareness of treatment options beyond surgery (like chemotherapy and radiation therapy) suggests an incomplete understanding of available healthcare solutions.

5.5 Awareness and Knowledge level of Cervical Cancer

The study revealed varying levels of awareness of cervical cancer. While 75.4% of respondents had heard about the condition, 68.27% had good awareness, and only 58.12% demonstrated good knowledge. This picture is consistent with broader trends in Sub-Saharan Africa, where awareness often outpaces comprehensive understanding. This is demonstrated in a report by (*Baik et al. 2025*) indicates that while 95% of individuals were aware of cervical cancer, only 37.8% had heard of HPV.

The limited exposure to formal education about cervical cancer in schools where only 14.7% of respondents reported regular education emphasizes a gap in educational efforts. This is similar to patterns reported by (*Enebe et al. 2021*) in Enugu, Nigeria, where researchers found that only 14.6% of female secondary school teachers had ever taught students about cervical cancer, and merely 9% reported that their school ran any program addressing cervical cancer or HPV vaccination. This is particularly concerning given the potential for peer education, as demonstrated by (*Sadoh et al. 2018*) for HPV and cervical cancer knowledge.

Knowledge gaps regarding cervical cancer were also evident. Regarding symptoms, less than 30% of students could identify any of the common signs of cervical cancer, such as pain during intercourse or pelvic pain. Notably, a third of the respondents admitted to having no knowledge of symptoms, signaling a critical need for targeted awareness campaigns. This finding aligns with a study conducted by (*Shaahu and Mohammed 2018*) among female students of Salaga Senior High School in Ghana. The study reported that although more than half of the respondents (53.9%) had heard about cervical cancer, the majority were unable to correctly identify its causes or risks factors. Additionally, as many as 70.8% of the respondents lacked knowledge of the symptoms and early diagnostic methods for cervical cancer. The study further highlighted that, as much as

70.8% of the respondents did not know any symptom for cervical cancer and almost half of the respondents are not aware of screening and early diagnostic methods for cervical cancer (*Bawah, Suhuyini and Mohammed, 2018*).

While 72.8% of respondents recognized that cervical cancer is preventable, awareness of specific preventive measures such as the HPV vaccine was limited, with only 32.5% of participants being aware of its role in prevention. Similarly, only 42.4% of respondents reported knowledge of Pap smear screening, a critical secondary prevention method. This is concurrent with findings from (*Manortey and Agyemang 2018*) where only 29.3% and 17.7% female senior high schoolers knew about cervical cancer screening and HPV vaccines respectively. Again, the findings are similar to that of a study of (*Ndubuisi, Maphasha and Okeke 2024*) in Pretoria, South Africa, where only 32.6% of female students were aware of the Pap smear test, less than half (43.2%) were aware of the cervical cancer vaccine and only 43.7% knew it was available locally,

Additionally, the identification of non-risk factors such as poor hygiene and the minimal recognition of key risk factors (e.g., multiple sexual partners or early sexual activity) indicate widespread misinformation or lack of depth in knowledge. These findings are consistent with previous study in Ghana by (*Ampofo et al. 2024*) which revealed that about half of female students incorrectly believed that poor hygienic practices (47%) and activities pertaining to the introduction of foreign substances into the vagina (46%) may lead to cervical cancer, and that cervical cancer can be transmitted through blood (44%) and can be prevented by praying to God (42%).

5.4 Factors Influencing Awareness and Knowledge level of Breast Cancer

The study identified several sociodemographic factors influencing awareness and knowledge of breast cancer. The results indicate that age is a significant factor influencing breast cancer awareness among female students. Respondents aged 17–20 years were nearly twice as likely to

exhibit higher levels of awareness compared to their younger counterparts aged 12–16 years. This finding aligns with prior findings in Southwestern Nigeria by (*Effiong, Afolabi and Chinedu, 2023*) who observed that female adolescent students (13–19 years) had lower awareness of breast cancer compared to older groups. This suggests that as students mature, their exposure to health information improves, possibly due to greater cognitive development or cumulative academic exposure.

Similarly, class level also emerged as a significant factor in the crude analysis. SHS 2 and SHS 3 students showed higher knowledge and awareness levels compared to SHS 1 students, although the association diminished in the adjusted model, leaving only SHS 2 remained marginally significant. This trend suggests that academic progression contributes to increased awareness, likely due to cumulative exposure to health education as students advance in school. This finding aligns with evidence from (*Garai et al. 2025*) who revealed that third-year female students in their research had significantly higher levels of breast cancer knowledge compared to students in earlier years. Similar patterns have been reported in a natural experiment in Lesotho by (*Liao et al. 2025*) which demonstrated a causal effect of girls' educational attainment on cancer awareness, where each additional year of schooling significantly increased awareness of breast cancer ($p = 0.014$, 95% CI: 1.0, 8.5).

Interestingly, course of study also emerged as a critical factor influencing breast cancer awareness, with students in General Science and Home Economics demonstrating substantially higher odds of awareness compared to those in General Arts. These finding is partially contrasted by a recent study by (*Sudhakar et al. 2025*) on health literacy among college students, which found no significant effect of 'discipline of study' on health literacy.

Interestingly, religion and ethnicity did not significantly influence breast cancer awareness in the adjusted models. Though crude odds ratios suggested disparities for certain groups, such as

MoleDagboni ethnicity and Islam, these associations lost significance after adjustment. These concur with evidence from Addis Ababa, Ethiopia (*Abeje, Seme and Tibelt, 2019*). According to (*Abeje, Seme and Tibelt, 2019*), while breast cancer screening awareness was significantly associated with income, education, urban residence, and family history, religion and ethnicity showing no independent effect on breast cancer awareness in multivariate models. These findings emphasize the importance of tailoring educational interventions to specific subgroups to address disparities in awareness and knowledge.

Importantly, breast cancer knowledge itself was marginally associated with awareness (AOR: 1.78, $p = 0.059$), indicating a trend where better-informed students were more likely to be aware of the disease. Although the adjusted association was not statistically significant, the near significant result highlights the potential reciprocal relationship between knowledge and awareness. This finding is supported by (*Nsaful et al. 2022*) where an intervention among adolescent high school girls in Ghana showed that structured breast cancer education significantly improved knowledge and self-reported awareness (e.g., recognition of risk factors and screening methods). This supports the theory that awareness is a precursor to knowledge acquisition, underscoring the value of foundational outreach efforts. This bidirectional relationship is a cornerstone of health behavior theories, including the Health Belief Model (*Alyafei and Easton- Carr, 2024*).

5.6 Factors Influencing Awareness and Knowledge level of Cervical Cancer

Similar to breast cancer, age significantly influenced cervical cancer awareness. Students aged 17–20 years were approximately 1.88 times more likely to exhibit higher awareness compared to the younger cohort. This finding contradicts with work by (*Manortey and Agyemang 2018*) which found no statistically significant difference in cervical cancer knowledge across age groups,

although the OR for the 16–18 group (1.30) trended in a similar positive direction (*Manortey and Agyemang, 2018*).

Class level was another determinant of cervical cancer awareness. SHS 2 students exhibited significantly higher odds of awareness compared to SHS 1 students, while the association for SHS 3 students was weaker and statistically insignificant. The variability in awareness among SHS 3 students suggests that while academic progression can enhance awareness, the effect may plateau or be moderated by other factors in higher classes. This partially concurs with findings from (*Manortey and Agyemang 2018*) which revealed that cervical cancer knowledge was significantly associated with grade/form (*p-value 0.002*) of female senior high school students in Lower Manya Krobo Municipal in Ghana.

The course of study significantly influenced cervical cancer awareness, with students in General Science and Home Economics having substantially higher odds of awareness than those in General Arts. These patterns are similar to research by (*Tesfaye et al. 2019*), whose binary logistic analysis revealed that female students from health or science related departments were associated with cervical cancer awareness.

Cervical cancer knowledge was not a significant predictor of awareness in the adjusted model. Although crude analysis suggested a positive association, the effect diminished after controlling for other variables. This suggests that awareness campaigns alone may not suffice to improve knowledge and that additional interventions may be necessary (*Dedey et al., 2024*). This finding does not align with widely-accepted theories like the health belief model, which postulates that awareness is a precursor to knowledge acquisition and behavior change (*Alyafei and Easton-Carr, 2024*).

Unlike awareness, knowledge of cervical cancer was not significantly associated with age, class, religion, ethnicity, or course of study. This aligns with mixed-regression results from (*Ampofo et al. 2024*) revealing that age (per year), ethnicity, and program of study did not significantly predict cervical cancer prevention knowledge scores.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study assessed the awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School in the Asuogyaman District of Ghana. The findings provide critical insights into how young women perceive, understand, and respond to breast and cervical cancer, which are significant public health concerns. Awareness of breast cancer was notably high, with 97.2% of respondents having heard about the condition. However, detailed knowledge of breast cancer was limited, as only 31.7% of participants demonstrated "Good Knowledge." Misconceptions about breast cancer were widespread, with 60.9% erroneously believing that wearing tight bras causes breast cancer. On the other hand, practical knowledge, such as performing breast self-examinations (reported by 69.3% of respondents), was encouraging but insufficiently complemented by awareness of advanced treatment options like chemotherapy and radiation therapy.

For cervical cancer, 75.4% of respondents reported being aware of the condition, yet knowledge of specific preventive measures, such as the HPV vaccine (32.5%) and Pap smear screenings (42.4%), was suboptimal. Misunderstandings about risk factors, symptoms, and prevention strategies were also evident. Healthcare providers were the most frequently cited source of information for both breast and cervical cancers, followed by schools and media platforms.

The study also revealed the students' awareness and knowledge levels were influenced by sociodemographic factors such as age, class level, and course of study. Older students (17–20 years) and those in SHS 2 exhibited higher levels of awareness and knowledge of cervical cancer

compared to their younger counterparts. Similarly, students in science-related programs, such as General Science and Home Economics, performed better in terms of both awareness and knowledge. However, variables such as religion and ethnicity did not demonstrate significant associations, implying that cultural and religious backgrounds may be less determinant in this context.

Overall, while awareness of breast and cervical cancers among female students at Akwamuman Senior High School was encouragingly high, significant gaps in knowledge remain. Misconceptions, inadequate formal education, and limited access to preventive services were identified as barriers to effective health literacy. These findings necessitate the urgent need for targeted interventions to improve knowledge and foster positive attitudes and practices toward breast and cervical cancer prevention and treatment.

6.2 Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance awareness and knowledge of breast and cervical cancer among female students:

1. Integrate Comprehensive Cancer Education into School Curriculum: The Ghana Education Service (GES) and school authorities should collaborate with the Ministry of Health to develop and integrate detailed, age-appropriate breast and cervical cancer modules into the senior high school curriculum. These modules should cover causes, symptoms, risk factors, prevention (including HPV vaccination and screening), and available treatment options. Schools should also distribute educational materials such as brochures, infographics and posters on these topics to ensure consistent messaging.

2. Establish Peer Health Education Initiatives: The School should establish peer health education programs by training selected students to serve as peer educators. These

individuals can lead informal discussions, provide accurate health information, increase receptiveness and create stigma-free environments for students to discuss breast and cervical cancer. Such initiatives can normalize conversations around these conditions and foster a culture of awareness and support, especially in settings where teacher-led discussions might be limited.

3. **Expand Research on Adolescent Health Education:** Further studies should be conducted to explore the factors influencing differences in awareness and knowledge levels among students in various academic programs. Additionally, national-level research involving representative samples of senior high school students across Ghana is recommended to provide a broader understanding of adolescents' knowledge, attitudes, and practices regarding breast and cervical cancer.

Insights from such research could guide the development of policies and programs to improve adolescent reproductive health education.

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APPENDIX

APPENDIX I: INFORMED CONSENT

CONSENT FORM (for students aged 18 and above or parents/guardians of minors):

Title of Study: Assessing Awareness and Knowledge of Breast and Cervical Cancer Among Female Students: A Case Study of Akwamuman Senior High School, Asuogyaman District, Ghana

Introduction:

You are invited to participate in a research study conducted by Ms. Eunice Asabea Addo from Ensign Global University. The purpose of this study is to assess the awareness and knowledge of breast and cervical cancer among female students at Akwamuman Senior High School in the Asuogyaman District of Ghana. Your participation is entirely voluntary, and you may withdraw at any time without any negative consequences.

Purpose of the Study:

The study aims to:

1. Identify the primary sources of information through which these students acquire knowledge and awareness about breast and cervical cancer.
2. Determine the current level of knowledge regarding breast and cervical cancer among female students at Akwamuman Senior High School.

3. Identify the factors influencing awareness and knowledge of breast and cervical cancer among female students

Procedures:

If you agree to participate, you will be asked to complete a structured questionnaire administered by the researcher or a trained assistant. The questionnaire will cover topics related to your knowledge, information sources, and perceived challenges in learning about breast and cervical cancer. The entire session is expected to take approximately 30 minutes and will take place in a private and safe space within the school environment.

Potential Risks and Discomforts:

There are no anticipated physical or psychological risks associated with your participation. However, if any question makes you uncomfortable, you may choose not to answer or may stop the interview at any time.

Potential Benefits:

Although you may not receive direct personal benefits, your participation will help generate knowledge that may contribute to better health education policies and practices regarding breast and cervical cancer for female students in Ghana.

Confidentiality:

All responses will be kept confidential and anonymous. No identifying information will be collected or reported. The data will be stored securely and used solely for academic purposes. Results will be presented in a manner that ensures no individual can be identified.

Voluntary Participation and Withdrawal:

Participation in this study is entirely voluntary. You may choose not to participate or withdraw at any time without any penalty or academic disadvantage.

Compensation:

There is no financial compensation for participating. However, your contribution is highly valued and appreciated.

Questions and Contacts:

If you have any questions about this research or your rights as a participant, you may contact:

Principal Researcher:

Eunice Asabea Addo

Ensign Global University, Kpong Eastern

Region, Ghana eunice.addo@stu.ensign.edu.gh

0547031354

This research has been reviewed and approved by the Institutional Review Board (IRB) of Ensign Global University, Kpong. For inquiries about your rights as a participant, you may contact the IRB office at 0245762229 or registrar@ensign.edu.gh during working hours (8:00 am–5:00 pm).

Statement of Consent:

I have read and understood the above information, and I have had the opportunity to ask questions.

I voluntarily agree to participate in this study.

Participant's Name: _____ Date: _____

Participant's Signature: _____

Researcher's Signature: _____ Date: _____

APPENDIX II: ASSENT FORM

(For female students under 18 years of age)

Title of Study: Assessing Awareness and Knowledge of Breast and Cervical Cancer Among

Female Students: A Case Study of Akwamuman Senior High School, Asuogyaman District, Ghana

Introduction:

You are being asked to take part in a research study being done by Ms. Eunice Asabea Addo from Ensign Global University. This study is about understanding what female students know about breast and cervical cancer, where they get their information, and what helps them learn about these topics. If you agree, you will be asked to answer some questions in a questionnaire. This form is to help you understand what the study is about so you can decide if you want to be part of it.

What Will Happen:

If you decide to participate, you will answer some questions that take about 30 minutes. These questions will ask what you know about breast and cervical cancer and where you have heard about them. This will happen in a private and safe place at school.

Is There Any Risk?

There is no danger in being part of this study. If any question makes you feel uncomfortable, you can skip it or stop the interview at any time without getting into trouble.

Is There Any Benefit?

You may not get anything personally from this study, but your answers can help improve health education for female students in Ghana.

Do You Have to Be in the Study?

No. You do not have to take part in this study. Nobody will be upset with you if you say no. Even if you say yes now, you can stop later at any time.

Will Anyone Know Your Answers?

No one will know what you say. Your name will not be written down, and your answers will not be shared with anyone at school or outside the research team.

Questions and Contacts:

If you have questions about this study, you can talk to the researcher:

Eunice Asabea Addo

Ensign Global University, Kpong

Email: eunice.addo@stu.ensign.edu.gh

Phone: 0547031354

If you have any questions about your rights as someone in a research study, you can contact the

Ensign Global University Institutional Review Board (IRB):

Phone: 0245762229

Email: registrar@ensign.edu.gh (Monday–Friday, 8:00 am to 5:00 pm)

Assent Statement:

I have read (or had someone read to me) this form and I understand what the study is about. I had the chance to ask questions. I agree to take part in the study.

Student's Name: _____

Date: _____

Student's Signature/Thumprint (if able): _____

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THUMBPRINT

APPENDIX III: SURVEY QUESTIONNAIRE

Title: Assessing Awareness and Knowledge of Breast and Cervical Cancer Among Female

Students: A Case Study of Akwamuman Senior High School

Questionnaire ID: _____

Date: _____

Instructions:

- Please answer the following questions honestly and to the best of your knowledge.
- This survey is anonymous, and your responses will be kept confidential.
- Tick (✓) the appropriate box or fill in the blanks as required.

Section A: Demographic Information 1.

Age: _____

2. Class:

☐ SHS 1

☐ SHS 2

☐ SHS 3

3. Course:

- ☐ General Science
- ☐ General Arts
- ☐ Business
- ☐ Home Economics
- ☐ Visual Arts

4. Religion:

- ☐ Christianity
- ☐ Islam
- ☐ African Traditional Religion

5. Ethnic group:

- ☐ Ewe
- ☐ Akan
- ☐ GaDangme
- ☐ MoleDagbon
- ☐ Guan
- ☐ Other

Kindly specify other ethnic groups you belong to: _____

Section B: Awareness level of Breast and Cervical Cancers

I. Breast Cancer

6. Have you heard about breast cancer before?

☐ Yes

☐ No

7. **Have you ever received any formal education about breast cancers in school?**

☐ Yes, regularly

☐ Yes, occasionally

No, never

8. **Where do you get information about breast cancer?** *(Select all that apply)*

☐ School/Teachers

☐ Healthcare providers

☐ Family/Friends

☐ Media (TV, radio, internet, social media)

☐ Other

Kindly specify other sources of information: _____

9. Which month is dedicated as breast cancer awareness month globally?

☐ January

☐ October

☐ November

II. Cervical Cancer

10. Have you heard about cervical cancer before?

☐ Yes

☐ No

11. **Have you ever received any formal education about cervical cancers in school?**

☐ Yes, regularly ☐

Yes, occasionally ☐

No, never

12. **Where do you get information about cervical cancer? (*Select all that apply*)** ☐

School/Teachers

Healthcare providers

☐ Family/Friends

☐ Media (TV, radio, internet, social media)

☐ Other

Kindly specify other sources of information: _____

13. Which month is dedicated as cervical cancer awareness month globally?

☐ February

☐ January

Section C: Knowledge on Breast Cancer and Cervical Cancer

I. Breast Cancer

14. Which of the following are risk factors for breast cancer? (*Select all that apply*)

- ☐ Genetics (family history)
- ☐ Hormonal changes
- ☐ Lifestyle factors (e.g., smoking, diet)
- ☐ I don't know

15. Can breast cancer be caused by wearing tight bras?

- ☐ Yes
- ☐ No
- ☐ I don't know

16. What are the symptoms of breast cancer? (*You can select more than one.*)

- ☐ Lump in the breast
- ☐ Pain in the breast
- ☐ Nipple discharge or bleeding
- ☐ I don't know

17. Can breast cancer be prevented?

- ☐ Yes
- ☐ No

- o ☐ I don't know

18. If yes, how can breast cancer be prevented? *(Select all that apply.)*

- o ☐ Regular screening
- o ☐ Healthy lifestyle
- o ☐ I don't know

19. Are you aware of any treatment options for breast cancer?

- o ☐ Yes o

☐ No

20. If yes, which treatments do you know? *(Select all that apply)*

- o ☐ Surgery
- o ☐ Chemotherapy
- o ☐ Radiation therapy
- o ☐ Traditional medicine
- o ☐ I don't know

21. Do you know how to perform breast self-examinations?

☐ Yes

o ☐ No

II. Cervical Cancer

22. Which of the following are risk factors for cervical cancer? *(You can select more than one.)*

- o ☐ Human Papillomavirus (HPV) infection
- o ☐ Multiple sexual partners

- ☐ ☐ Poor hygiene
- ☐ ☐ Smoking
- ☐ Early sexual activity
- ☐ ☐ I don't know

23. What are the symptoms of cervical cancer? *(You can select more than one.)*

- ☐ ☐ Abnormal vaginal bleeding
- ☐ ☐ Pain during intercourse
- ☐ ☐ Pelvic pain
- ☐ ☐ Vaginal discharge with a bad odor
- ☐ ☐ I don't know

24. Can cervical cancer be prevented?

Yes

☐ ☐ No

☐ ☐ I don't know

25. If yes, how can cervical cancer be prevented? *(You can select more than one.)*

- ☐ ☐ Regular screening
- ☐ ☐ Healthy lifestyle

☐ ☐ Vaccination

☐ ☐ I don't know

26. Do you know about the HPV vaccine, which prevents cervical cancer?

☐ Yes

☐ ☐ No

27. Are you aware of cervical cancer screening (Pap smear)?

☐ Yes

☐ ☐ No

Thank you for participating in this survey! Your responses are appreciated!

**APPENDIX IV: ETHICAL CLEARANCE FORM ENSIGN GLOBAL
UNIVERSITY**



OUR REF: ENSIGN/IRB/EL/SN-306/03
YOUR REF:

August 4, 2025

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Eunice Asabea Addo
Ensign Global University
Kpong.

Dear Eunice,

ETHICAL CLEARANCE TO UNDERTAKE POSTGRADUATE RESEARCH

At the General Research Proposals Review Meeting of the *INSTITUTIONAL REVIEW BOARD (IRB)* of Ensign Global University held on Friday, August 1, 2025, your research proposal entitled **"Assessing Awareness and Knowledge of Breast and Cervical Cancer Among Female Students: A Case of Akwamuman Senior High School, Asuogyaman District, Ghana"** was considered.

You have been granted Ethical Clearance to collect data for the said research under academic supervision within the IRB's specified frameworks and guidelines.

We wish you all the best.

Sincerely,

A handwritten signature in black ink, appearing to read "Rebecca Acquah-Arhin".

Dr. (Mrs.) Rebecca Acquah-Arhin
IRB Chairperson

**APPENDIX V: APPROVAL LETTER FROM AKWAMUMAN SENIOR HIGH
SCHOOL**

AKWAMUMAN SENIOR HIGH SCHOOL		
BANKERS: Ghana Commercial Bank Akosombo		P. O. Box 46, Akosombo Tel: 03430-20240/98347/98348
Our Ref: <u>ASS-170146/2</u>		Date: <u>25/07/2015</u>
Your Ref: _____		

THE REGISTRAR
ENSIGN GLOBAL UNIVERSITY
P.O. BOX AK136
TEMA-AKOSOMBO HIGHWAY-KPONG (E/R)

Dear Sir/Madam,

LETTER OF ACCEPTANCE

I write to formally accept your desire to have your student, Miss Eunice Asabea Addo (Student Identification Number **247100306**) conduct research at Akwamuman Senior High School on the topic, 'Assessing Awareness and Knowledge of Breast and cervical Cancer among female students: A case study in Akwamuman Senior High School, Asuogyaman District, Eastern Region, Ghana'.

As a public institution, we are always ready to make our facilities available for any academic exercise of this nature. We further hope the research will be conducted in accordance with ethical guidance and protocols as enshrined in the Ghana Education Service code of conduct for staff and students.

Thank you.

Yours sincerely,

Adamu Bukari Sadik
(Asst. Administration)


 **Asst. (Administration)**
AKWAMUMAN S.H.S
P. O. Box 46
AKOSOMBO

CC:
MS. EUNICE ASABEA ADDO
ENSIGN GLOBAL UNIVERSITY
P.O. BOX AK136
TEMA-AKOSOMBO HIGHWAY-KPONG (E/R)

Discipline and Knowledge

APPENDIX VI: APPROVAL LETTER FROM ASUOGYAMAN HEALTH DIRECTORATE

In case of the reply the number and the date of this letter should be quoted. My Ref. No. ASG/TAS/ <i>12</i> 125 GHS CORE VALUES • PEOPLE CENTRED • PROFESSIONALISM • TEAM WORK • INNOVATION/EXCELLENCE • DISCIPLINE • INTEGRITY	 GHANA HEALTH SERVICE Your Health - Our Concern	GHANA HEALTH SERVICE ASUOGYAMAN DISTRICT HEALTH ADMIN. P. O. BOX 1 AKOSOMBO 031-2297227 12th August, 2025
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The Rector
Ensign Global College

ETHICAL CLEARANCE TO MS. EUNICE ASABEA ADDO

I write to inform your outfit that the District Director of Health Service of Asuogyaman has granted permission for Ms. Eunice Asabea Addo to undertake his research on Assessing Awareness and Knowledge of Breast and Cervical Cancer in the Asuogyaman district.

Thank you.



Head of Administration
ASUOGYAMAN DISTRICT
HEALTH DIRECTORATE
P. O. Box 1, AKOSOMBO

Jessica Fuseina Kasim
Principal Executive Officer
For: District Director of Health Service

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