Available on: https://jnsrr.ep-journals.org/ E-ISSN: 3051-3766 P-ISSN: 3051-3758

Journal of Natural Science Research and Review
Volume: 01 Issue: 04 October-2025

Breast Cancer Awareness and Screening Practices Among Women: A Case Study at Tamale Metropolis, Ghana

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Published Date: October 29, 2025 **Article DOI: 10.65150/EP-jnsrr/V1E4/2025-03**

ABSTRACT: Background: This study aimed to assess breast cancer awareness, perception, and screening practices among women in the Tamale Metropolis of Ghana. Despite global efforts to promote early detection, many women in low- and middle-income countries, including Ghana, continue to experience delayed diagnosis and poor outcomes due to limited awareness and access to screening services.

Methods: The study employed a descriptive cross-sectional research design. A total of 396 adult women aged 18 years and above were selected using a stratified random sampling technique. Data were collected using a structured, self-administered questionnaire and analyzed using SPSS with chi-square tests to determine associations. The results indicated that the respondents had an average level of awareness (51%), average perception and attitude (44.71%), and average screening practice (44.71%). Despite facing certain challenges, there was a moderate level of breast cancer awareness and screening practices among women in the Tamale Metropolis, Ghana.

Findings: The study found that ethnicity had a statistically significant association with breast cancer awareness and screening practices among women in Tamale Metropolis ($\chi^2 = 36.833$, $p = 0.000$). Conversely, education level exhibited a non-significant association with awareness ($\chi^2 = 2.654$, $p = 0.690$), while age demonstrated a strong significant association with mammogram utilization ($\chi^2 = 117.435$, $p = 0.000$). Religion also had a significant influence on clinical breast examination and mammogram practices ($\chi^2 = 12.228$, $p = 0.001$; $\chi^2 = 12.615$, $p = 0.001$, respectively).

Conclusion: The findings suggest that socio-demographic characteristics, particularly age, ethnicity, and religion, significantly influence breast cancer awareness and screening behaviors. Based on these findings, it is recommended to strengthen community-based education initiatives and increase access to age- and culture-sensitive breast screening programs. Improving early detection strategies will be vital in reducing breast cancer morbidity and mortality in the region.

KEYWORDS: Breast cancer, Awareness, Screening Practices

INTRODUCTION

Globally, cancer remains a major cause of morbidity and mortality among women, with approximately 17.5 million cases and 9 million deaths recorded in 2015. Among all types, breast cancer has emerged as the most common form, increasing from 1.7 million cases in 2005 to 2.4 million in 2015 (Sedeta et al., 2023). The number of new cases is expected to reach 15 million annually by 2025, with 60% projected to occur in developing countries (Khanikar et al., 2022). Although advancements in breast cancer diagnosis and treatment have been observed globally, these improvements are not equally distributed. High-income countries have made notable progress, while many low- and middle-income countries (LMICs), especially in Africa, continue to face significant barriers.

In LMICs, challenges such as weak health infrastructure, limited population awareness, delayed health-seeking behavior, low levels of female education, and incomplete vital registration systems contribute to late-stage diagnoses and high mortality rates. According to the World Health Organization (WHO, 2013), more than 50% of women in developing countries have never undergone a breast screening test. Afaya et al.

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(2022) notes that globally, a woman is diagnosed with breast cancer every 19 seconds, illustrating the rapid spread of the disease. Consequently, breast cancer is no longer just a health issue but a pressing public health concern with global implications (Katsika et al., 2024).

Early detection and prompt treatment are considered the most effective strategies for managing breast cancer and improving patient outcomes (Loibl et al., 2023). However, the incidence, mortality, and survival rates vary significantly by up to tenfold across different regions, depending largely on the availability of screening programs and access to care. Alarmingly, Africa currently holds the highest age-standardized mortality rate from breast cancer. Contributing factors such as urbanization and Western dietary habits are suspected but not fully established (Khalid et al., 2024).

In Ghana, breast cancer is the most prevalent malignancy among women, with around 70% of cases presenting at advanced stages (Der & Abantanga, 2023). The annual incidence is on the rise, with approximately 2,900 cases diagnosed each year since 2012. Alarmingly, at least one in eight affected women dies from the disease (Afaya et al., 2024). Efforts to address breast cancer prevention and control in Ghana remain hampered by a lack of reliable epidemiological data. The absence of a comprehensive national cancer registry makes it difficult to design evidence-based interventions (Tuck et al., 2023). Although the Ghana Ministry of Health has initiated advocacy to unify cancer registers nationwide (Tuck et al., 2023), the lack of data continues to hinder effective policymaking.

In regions such as the three Northern regions of Ghana, including Tamale Metropolis, healthcare access is further constrained by the scarcity of professional health workers. This disparity compels women to seek help from informal healthcare providers or traditional healers before seeking professional care, often resulting in delayed diagnosis and advanced disease presentation. As a Nurse Manager at the Out-Patient Department (OPD) of Tamale Teaching Hospital, the researcher has observed a troubling trend: many women with breast abnormalities report symptoms that had been ongoing for extended periods—ranging from days to years before seeking formal medical attention.

Studies conducted in other parts of Ghana, such as Kumasi, confirm this trend. Bosompem et al. (2024) reported that breast cancer predominantly affects young, pre-menopausal women, with the peak incidence between ages 40–49. Similarly, Bosompem et al. (2024) found the highest incidence rates for invasive ductal carcinoma among women aged 25–44. These findings suggest a troubling shift in incidence toward younger, reproductive-age women.

Given these realities, the current study aims to assess the level of breast cancer awareness, perception, and screening practices among adult women in the Tamale Metropolis of Northern Ghana. Understanding these factors is critical for designing targeted interventions that can promote early detection and improve outcomes in underserved regions.

Research Questions

Generally, this study was aimed at assessing breast cancer awareness and practices of breast cancer screening among adult women in the Tamale metropolis in Ghana. Specifically, the study sought to:

1. Assess the level of awareness of breast cancer among adult women in the Tamale Metropolis.
2. Examine the perception of adult women towards breast cancer screening in Tamale metropolis.
3. Assess breast cancer screening practices among adult women in the Tamale metropolis.
4. Determine the relationship between socio-demographic characteristics (a. age, b. religion, c. educational level, d. ethnicity) and breast cancer awareness of the women in the Tamale metropolis.
5. Determine the relationship breast cancer screening practices and the socio-demographic characteristics (a. age, b. religion, c. educational level, d. ethnicity) of women of Tamale metropolis.

Conceptual Framework

As Figure 1 shows, this study assess breast cancer awareness and practices of breast cancer screening among adult women in the Tamale metropolis in Ghana.

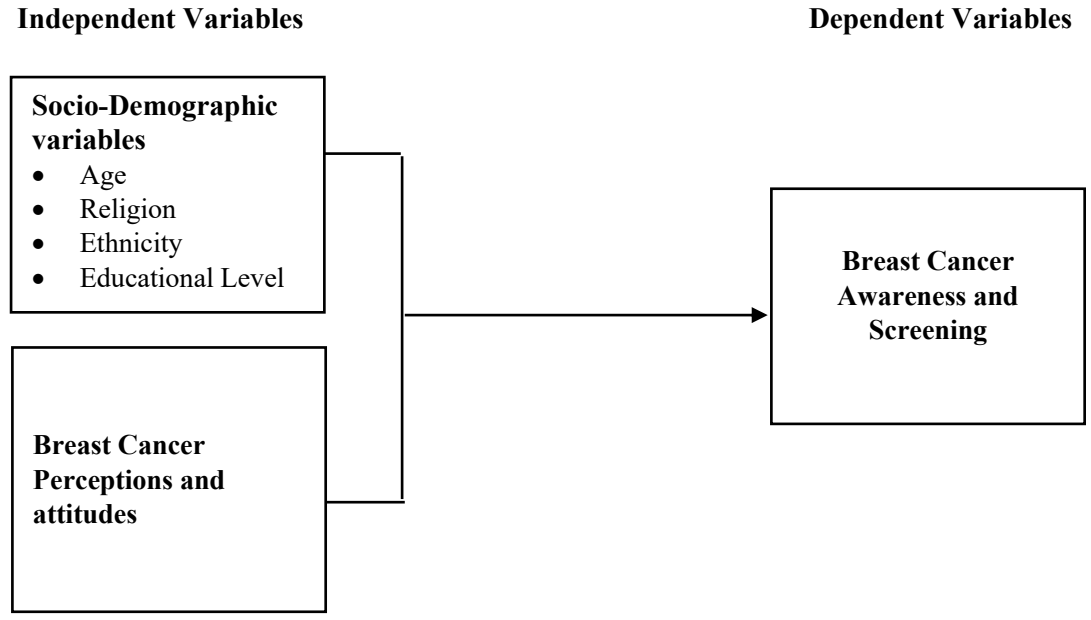


Figure 1: Research Paradigm of the Study

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METHOD

This study used a descriptive cross-sectional research design to gather structured data. A sample of 396 adult women aged 18 years and above from Tamale Metropolis was selected through a stratified random sampling technique with proportional allocation across area councils. Data were collected using a self-administered questionnaire with closed-ended and dichotomous items covering socio-demographic characteristics, breast cancer awareness, and perceptions. The instrument's reliability was validated in a pilot study involving 30 participants, achieving a Cronbach's alpha above 0.75, confirming its consistency and accuracy. Standardized questionnaire administration methods were employed, supported by ethical measures, including informed consent, voluntary participation, and confidentiality. Data analysis used Microsoft Excel and SPSS, employing descriptive statistics (frequencies and percentages), Pearson Chi-Square Test, and Fisher's Exact Test to examine associations between variables at a significance level of $p \leq 0.05$.

RESULTS AND DISCUSSION

Respondents' Level of awareness of breast cancer

Table 1 presents the grand mean score of respondents' level of awareness of breast cancer risk factors. The grand mean was 202 with a percentage of 51%, indicating an overall qualitative descriptor of Average level of awareness. Based on these results, it is generally observed that the respondents had a moderate understanding of breast cancer risk factors, with notable gaps in knowledge regarding less commonly emphasized risks.

The highest awareness score was recorded for Item 3 (74.2%), which stated that *"Do you think that having a family history of breast cancer increases the risk of developing breast cancer?"* This high level of awareness suggests that respondents are relatively well-informed about hereditary risk factors, which are often emphasized in public health education campaigns.

Conversely, Item 8 shows the lowest awareness score (7.3%), which stated that *"Do you think early onset of menstruation (before the age of 12 years) is a risk factor for breast cancer?"* This lower score suggests that while general awareness of breast cancer may be high, knowledge of specific reproductive-related risk factors remains low, indicating the need for enhanced targeted education and sensitization in these areas.

No.	Level of awareness of breast cancer	Frequency of correct answer	Percentage of correct answers	Qualitative descriptor
A.	**General Awareness**			
1.	Have you ever heard of breast cancer?	392	99.0	Very High
2.	Do you believe that breast cancer exists in your community?	392	99.0	Vey High
B.	**Risk factor for developing breast cancer**			
3.	Do you think that menopause is a risk factor for developing breast cancer?	108	27.3	Low
4.	Do you think that having a family history of breast cancer increases the risk of developing breast cancer?	294	74.2	High
5.	Do you believe that cigarette smoking is a risk factor for developing breast cancer?	284	71.7	High
6.	Do you think the use of oral contraceptives increases the risk of developing breast cancer?	54	13.6	Very Low
7.	Do you think having the first child after the age of 30 increases the risk of developing breast cancer?	63	15.9	Very Low
8.	Do you think early onset of menstruation (before the age of 12 years) is a risk factor for breast cancer?	29	7.3	Very Low
Average		202	51	Average

Legend: 0-20= Very Low; 21-40=Low, 41-60=Average, 61-80=High; 81-100= Very High

Respondents' Level of perception and attitude towards Breast cancer screening

Table 2 presents the grand mean score of respondents' perception and attitude towards breast cancer screening. The grand mean was 174 with a percentage of 44.71%, indicating an overall qualitative descriptor of *"Average"* level of perception and attitude. Based on these results, it

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is generally observed that the respondents had a moderate understanding of breast cancer causes and a relatively positive disposition toward screening and health-seeking behaviors, although significant knowledge gaps remain.

The highest awareness score was recorded for Item 7 (99.0%), which stated that *"I believe that breast cancer screening is helpful in detecting the disease before symptoms appear."* This high level of agreement suggests that respondents are strongly aware of the role of early detection in improving breast cancer outcomes and demonstrate a positive attitude toward screening as a preventive measure.

Conversely, Item 4 shows the lowest awareness score (1.5%), which stated that *"I believe that eating too much sugar can cause breast cancer."* This lower score suggests that respondents largely do not associate sugar consumption with breast cancer, which aligns with current scientific evidence, though other misconceptions such as bacterial or spiritual causes still persist.

No.	Perception and attitude towards Breast cancer	Frequency	Percentage	Qualitative descriptor
Perceived Causes of Breast Cancer				
1.	I believe that breast cancer can be caused by bacterial infection.	203	51.3	Average
2.	I believe that breast cancer can be caused by a spiritual curse.	40	10.1	Very Low
3.	I believe that witchcraft can cause breast cancer.	18	4.5	Very Low
4.	I believe that eating too much sugar can cause breast cancer.	6	1.5	Very low
5.	I do not know what causes breast cancer.	129	32.6	Low
6.	I believe that I am at risk of developing breast cancer.	353	89.1	Very High
7.	I believe that breast cancer screening is helpful in detecting the disease before symptoms appear.	392	99.0	Very High
8.	I am willing to undergo free breast cancer screening if offered.	369	93.2	Very high
Reaction to Discovery During Breast Self-Examination				
9.	If I found something unusual during a self-breast exam, I would visit a hospital immediately.	357	90.2	Very High
10.	If I found an abnormality, I would prefer to pray and wait.	15	3.8	Very Low
11.	If I noticed a lump, I would visit a traditional healer.	4	1.0	Vey Low
12.	If I discovered a change in my breast, I would do nothing.	20	5.0	Very Low
Perception on the Curability of Breast cancer				
13.	I believe there is no cure for breast cancer.	356	100	Very High
Average		174	44.71	Average

Legend: 0-20= Very Low; 21-40=Low, 41-60=Average, 61-80=High; 81-100= Very High

Respondents' level Screening Practices for Breast Cancer

Table 3 presents the grand mean score of respondents' screening practices for breast cancer. The grand mean was 152.66, with a percentage of 44.71%, indicating an overall qualitative descriptor of *"Average"* level of screening behavior. Based on these results, it is generally observed that the respondents had a moderate engagement in breast cancer screening practices, with significant variation in the use of specific screening methods.

The highest awareness score was recorded for Item 1 (86.4%), which stated that *"Have you ever performed a breast self-examination?"* This high level of practice suggests that respondents are more familiar with, and more likely to engage in, breast self-examination compared to other formal screening methods, possibly due to its convenience, accessibility, and lack of cost.

Conversely, Item 3 shows the lowest practice score (6.6%), which stated that *"Have you ever done a mammogram?"* This lower score suggests that respondents have very limited access to mammography services or may lack adequate awareness, referral, or financial means to utilize this formal diagnostic screening method.

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No.	Screening Practices for Breast Cancer	Frequency	Percentage	Qualitative descriptor
Screening Practices for Breast Cancer				
1.	Have you ever performed a breast self-examination?	342	86.4	Very High
2.	Have you ever received a clinical breast examination from a health professional?	90	22.7	Low
3.	Have you ever done a mammogram?	26	6.6	Very Low
Average		152.66	44.71	Average

Legend: 0-20= Very Low; 21-40=Low, 41-60=Average, 61-80=High; 81-100= Very High

Relationship between breast cancer awareness and socio-demographic.

Table 4 presents the association analysis to determine the relationship between breast cancer awareness and various socio-demographic characteristics of the respondents. As shown in Table 4, socio-demographic variables had a statistically significant assosiation to breast cancer awareness, particularly for religion *($\chi^2 = 8.810$, $p = 0.012$), age ($\chi^2 = 9.433$, $p = 0.035$),* and ethnicity *($\chi^2 = 36.833$, $p = 0.000$).* However, education level *($\chi^2 = 2.654$, $p = 0.690$)* did not show a significant relationship.

Therefore, the hypothesis that stated there is no significant relationship between socio-demographic characteristics and breast cancer awareness is partially rejected. The null hypothesis is rejected for religion, age, and ethnicity, indicating that these variables significantly influence breast cancer awareness. In contrast, the null hypothesis is retained for education level, implying no statistically significant association in this sample.

It is important to note that, according to Statistics Solutions (2025), the interpretation standards suggest that a χ^2 value of 36.833 between ethnicity and breast cancer awareness indicates a strong association, particularly given the extremely low p-value ($p < 0.001$). This finding implies that cultural or ethnic background may be a major determinant of awareness. Interestingly, formal education level did not exhibit a statistically significant influence on awareness in this context, which may suggest the need for more culturally tailored health education strategies rather than assuming educational attainment guarantees awareness.

No.	Variable	χ^2	df	P-value	Interpretation
Socio Demographic					
1.	Religion	8.810	1	0.012*	Statistically Significant association
2.	Age	9.433	6	0.035*	Statistically Significant association
3.	Ethnicity	36.833	9	0.000*	Statistically Significant association
4.	Education Level	2.654	4	0.690*	No significant Association

Legend: $p < 0.05$ = Statistically significant, $p > 0.05$ = Not statistically significant

Relationship between breast cancer Screening and socio-demographic.

Table 5 presents the relationship between breast cancer screening practices and socio-demographic characteristics of the respondents. The results reveal statistically significant associations, particularly with age, ethnicity, and educational level across all three screening methods(breast self-examination, clinical breast examination, and mammogram). Religion also showed significant associations with clinical breast examination and mammogram utilization but not with breast self-examination.

The findings indicate that breast self-examination is significantly associated with age ($\chi^2 = 54.858$, $p = 0.000$), ethnicity ($\chi^2 = 103.323$, $p = 0.000$), and educational level ($\chi^2 = 117.752$, $p = 0.000$). Clinical breast examination shows significant associations with religion ($\chi^2 = 12.228$, $p = 0.001$), age ($\chi^2 = 91.155$, $p = 0.000$), ethnicity ($\chi^2 = 48.687$, $p = 0.000$), and education ($\chi^2 = 15.725$, $p = 0.003$). Similarly, mammogram utilization is significantly related to religion ($\chi^2 = 12.615$, $p = 0.001$), age ($\chi^2 = 117.435$, $p = 0.000$), ethnicity ($\chi^2 = 45.413$, $p = 0.000$), and educational level ($\chi^2 = 31.403$, $p = 0.000$). Therefore, the hypothesis stating no significant relationship between socio-demographic characteristics and breast cancer screening is rejected.

According to Statistics Solutions (2025), a χ^2 value of 117.435 between age and mammogram utilization, with a p-value of 0.000, indicates a strong association. This implies that age is a major determinant influencing women's decision to undergo mammogram screening. These findings underscore the importance of age-specific and culturally sensitive breast cancer awareness and screening programs to improve early detection efforts.

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Breast cancer screening test performed		Demographic Characteristics			
		Religion	Age	Ethnicity	Educ. Level
Breast self-examination	χ^2	0.439	54.858	103.323	117.752
	df	1	6	9	4
	p value	0.508	0.000*	0.000*	0.000*
Clinical breast examination	χ^2	12.228	91.155	48.687	15.725
	df	1	6	9	4
	p value	0.001*	0.000*	0.000*	0.003*
Mammogram	χ^2	12.615	117.435	45.413	31.403
	df	1	6	9	4
	p value	0.001*	0.000*	0.000*	0.000*

Legend: $p < 0.05$ = Statistically significant, $p > 0.05$ = Not statistically significant

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Women in Tamale Metropolis, Ghana have a moderate level of access and exposure to breast cancer awareness and screening practices. However, their engagement in formal breast cancer screening services such as clinical breast examinations and mammography has not reached its maximum potential effect due to limited knowledge, cultural misconceptions, and health system barriers.

Socio-demographic factors have a statistically significant association with breast cancer awareness. Conversely, educational level was found to have no significant association with awareness. Furthermore, socio-demographic characteristics such as age, religion, and ethnicity also demonstrated a significant association with breast cancer screening practices. Conversely, education level and marital status showed no significant association with screening uptake. The higher the community-level health sensitization, culturally tailored education, and accessibility to screening services, the better the level of breast cancer awareness and screening among women.

The results of the study supported and confirmed that breast cancer awareness and screening were largely influenced by social and cultural determinants rather than formal education or socioeconomic status alone. Based on these findings, it is recommended to enhance community-based interventions, strengthen primary healthcare services for screening, and integrate breast health education into public health campaigns, particularly those targeting religious and ethnic groups.

However, the researcher faced several limitations. A significant constraint was time, despite meticulous planning, which limited the expansion of the study to additional districts or conducting longitudinal follow-up. Additionally, the researcher encountered challenges with respondents' willingness to openly discuss personal health matters due to cultural sensitivity, recall bias in self-reported data, and logistical issues in reaching remote areas, which may have influenced the breadth and depth of data collected.

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