

Factors Influencing Breast Self-examination (BSE) Practice among Female Adolescents in the Hohoe Municipality, Ghana

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Abstract

Objective: Considering the high prevalence and mortality associated with breast cancer among females, this study investigates the factors influencing BSE practice among female adolescents in the Hohoe Municipality. **Methods:** A cross-sectional study design was adopted and multi-stage sampling procedure was utilized to collect data from 410 participants using the Kobo Collect software. The data were extracted and exported into STATA version 17 for cleaning and statistical analysis. Descriptive statistics were conducted, and the findings were presented in tables and graphs. Multiple logistic regression analyses were performed, with results reported at a 95% confidence interval. Statistical significance was set at a p-value of <0.05. **Result:** Only 32.8% of participants had ever heard of BSE, and 82.2% demonstrated poor BSE practice. After adjusting for confounders, two variables were significantly associated with BSE practice: residing in Hohoe (aOR=2.70, 95% CI: 1.16–6.26) and having prior knowledge of BSE (aOR=2.64, 95% CI: 1.52–4.56). **Conclusion:** BSE practice among female adolescents in the Hohoe Municipality is low, despite its significance in early breast cancer detection. Interventions targeting BSE education and rural health outreach are urgently needed to improve awareness and practice, especially among younger and rural populations.

Keywords: Girls- Breast Self-Screening- Breast Cancer- Breast Lump- Hohoe

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Introduction

Breast cancer is a malignant tumour that begins in breast cells, occurs primarily in females and can invade healthy tissue spreading beyond its original site [1]. While early stages typically show no symptoms, tumour growth may lead to a painless breast lump, breast pain, thickened or swollen breast skin, spontaneous bloody nipple discharge, and nipple erosion or inversion [2]. Although its incidence was once considered low, it is now increasing with mortality rates surpassing 75% in developing countries [3]. In 2020, there were 2.3 million new cases and 685,000 deaths worldwide, with 7.8 million people living with the disease by the end of 2020 [4]. Developing countries have a relatively lower prevalence but still account for half of all global breast cancer

diagnoses [4], and low- and middle-income countries (LMICs) now represent approximately 57% of cases and 65% of cancer deaths worldwide [5]. The increasing incidence of breast cancer in emerging nations is linked to changes in diet and lifestyle [6]. Limited access to early diagnosis and effective treatment results in poorer outcomes for women in LMICs, where only 32% survive five years after diagnosis compared to 81% in the United States [7, 8].

Breast cancer can develop even at a young age, with documented cases in individuals as early as 14 years old [9]. Recent data indicate an increasing occurrence of breast cancer symptoms among teenagers [9]. Adolescence is a period of significant physical changes, including breast

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development making it essential to educate girls about recognizing abnormal breast changes that may indicate cancer [10]. As most reproductive organs mature between the ages of 15 and 20, introducing BSE during this stage is critical [11]. Early education and consistent practice of BSE not only promote health-conscious behaviors but also establish a foundation for lifelong adherence to clinical breast examinations and mammography screenings [12, 13].

Women are generally encouraged to begin understanding the benefits and limitations of monthly BSE by age 20 [14]. However, awareness, knowledge, and perceptions about breast cancer strongly influence whether individuals seek appropriate healthcare [15]. Although breast cancer primarily affects older women, evidence suggests that some young women in Ghana are also affected. According to the WHO Cancer Country Profile for Ghana (2020), breast cancer is the leading cancer among Ghanaian females with an incidence rate of 20.4% [16]. Research shows that many adolescent girls lack the knowledge and skills to perform BSE effectively [17], yet its proper practice could greatly aid early detection and prevention, reducing the disease burden [18, 19]. This study seeks to explore the factors influencing BSE practice among female adolescents in the Hohoe Municipality. Findings from this study will provide evidence-based insights to guide policymakers in designing targeted health education programs that encourage regular BSE practice among young females.

Materials and Methods

Study design

This study employed a cross-sectional study design to gather data among female adolescents in the Hohoe Municipality.

Study site description

The Hohoe Municipal is one of the eighteen municipalities in the Volta region of Ghana situated 78 kilometers from Ho, the regional capital, and 220 kilometers from Accra, the nation's capital [20]. The municipality has a population of 114,472, with 59,579 females and 54,893 males, and a growth rate of 2.4%. The municipality has been divided into four (4) sub municipalities, namely, Alavanyo, Wli, Fodome and Hohoe. It has 21 health institutions including a hospital with a research centre. Hohoe is surrounded by the Jasikan District to the north, Boakye District to on the northwest, Kpando Municipality to the west and southwest, Afadjato South District to the south, and the Republic of Togo to the east. The ethnic composition is predominantly Ewe, along with Dagombas, Likpe, Lolobi, Ga-Adangme, and Akan-speaking groups. The primary religions are Christianity, Islam, and Traditional African worship [21].

Study Population

The study population comprised of female adolescents in the Hohoe municipality. The study included all female adolescents who have lived in the Hohoe municipality for

more than 12 months and consented to participate in the study. However, female adolescents who were terminally ill, absent at the time of data collection, or decline consent to participate were excluded.

Sample size determination

The required sample size for the study was calculated using Cochran's single proportion formula.

$n = z^2 pq/d^2$, where

n = sample size,

z = z-score at 95% confidence level is 1.96,

p = estimated proportion of 51.9% [22],

In this study, a margin of error (d) of 0.05 was assumed at a 95% confidence level.

$p=0.519$

$q = 1-p$,

$q=1-0.519$

$q=0.481$

$n = (1.96)^2 * 0.519 * 0.481 / (0.05)^2$

$n = 383.6 = 384$

A 7% adjustment for non-response increased the calculated sample size, resulting in a total of 410 participants for the study.

Sampling procedure

A multi-stage sampling procedure was adopted in this study. At stage one, the Hohoe Municipality was clustered into four towns based on its existing structure. Secondly, purposive sampling was used to select two (2) communities from each town, resulting in eight (8) communities. Thirdly, a simple random sampling technique was applied to select 51 respondents from six communities and 52 each from the remaining two communities, resulting in a sample size of 410 respondents. Hence, every individual in the population had an equal chance of being selected. This was done to provide a truly representative sample of the population.

Study Variables

Outcome variable

The study's outcome variable was BSE practice, assessed using five questionnaire items: (i) ever performed BSE, (ii) current practice status, (iii) last time BSE was performed, (iv) frequency of BSE, and (v) timing of BSE. Responses were coded as binary variables, with correct answers assigned "1" and incorrect answers "0." A composite variable was then created, categorizing respondents as having good practice "1" or poor practice "0".

Independent variables

Six independent variables were included in the analysis: age, religion, ethnicity, education level, location, and knowledge of BSE (ever heard of BSE).

Data collection instrument and procedure

The study used a questionnaire designed and deployed in a Kobo collect software. Data was gathered by the researcher with the assistance of experienced field

assistants. Cronbach's alpha was used to measure the reliability of the scale used. The study found a Cronbach alpha of 0.74, indicating good internal consistency of the scale. A week before data collection, the field assistants were trained. The research's purpose and procedures were explained to them, and they were encouraged to ask questions to clarify any doubts. Informed consent forms for study participants were thoroughly explained to them, and pretesting of the survey tools was done during the training period. This allowed the research team to gain practical experience in administering the study tools.

Data Analysis

Data collected were exported from Kobo Collect into STATA 17 for cleaning and analysis. Responses were coded numerically for entry, and descriptive statistics were used to summarize the data, with results presented in frequency tables and graphs. Both crude odds ratios (cOR) and adjusted odds ratios (aOR) were calculated using multiple logistic regression, and associations were considered statistically significant at $p < 0.05$ with a 95% confidence interval.

Ethical considerations

The Research Ethics Committee of the University of Health and Allied Sciences gave its approval for this study's ethical standards with approval number UHAS-RECA.10 [157] 22-23. From Hohoe Municipality authorities, permission and consent were sought for the project. All of the respondents' questions and concerns were addressed after an initial briefing and education on the study's objectives and methodology. Respondents' privacy and confidentiality were guaranteed. The handling, storing, analysis, and reporting of the data were done in a way that kept the respondents' personal information private. Details of the respondents were coded. Letters of consent were made accessible to all involved.

Results

Socio-demographic characteristics of participants

Table 1 shows the socio-demographic characteristics of the study participants. Most 165 (40.2%) of the participants were aged 17–19 years. The majority 376 (91.7%) identified as Christians, and slightly over half, 285 (69.5%), were Ewes. Additionally, 191 (46.6%) were SHS students, and 104 (25.4%) resided in Hohoe.

Practice of BSE among Female Adolescents in Hohoe Municipality.

The majority of the respondents 294 (71.7%) had never performed BSE and 351 (85.6%) do not practice BSE currently. Notably, 308 (75.1%) do not often perform BSE. Only 59 (14.4%) perform BSE once every month. A smaller proportion 56 (13.6%) of the participants performed BSE for the early detection of breast cancer. More than half 340 (82.9%) of them agreed that a health practitioner should help in performing BSE (Table 2).

The figure presents the overall practice of BSE among

participants. The majority (82.2%) of the them had poor practice of BSE (Figure 1).

Factors influencing BSE practice among participants

Results from the bivariate analysis showed that age, location, education level, and knowledge of BSE were significantly associated with BSE practice among participants. After adjusting for potential confounders in a multivariable analysis, only location and knowledge of BSE remained significantly associated with BSE practice among female adolescents. Those residing in Hohoe were 2.70 times more likely to practice BSE compared to those in Alavanyo (aOR = 2.70 [95% CI: 1.16–6.26]). Similarly, adolescents who had ever heard of BSE were 2.64 times more likely to engage in the practice than those who had not (aOR = 2.64 [95% CI: 1.52–4.56]). Other variables including age, religion, ethnicity, education level, and residence in Wli or Fodome showed no statistically significant association with BSE practice after adjustment (Table 3).

Discussion

The study examined the factors influencing BSE practice among female adolescents in the Hohoe Municipality. The findings revealed that 82.2% of the respondents demonstrated poor BSE practice. This aligns

Table 1. Socio-demographic Characteristics of Participants

Variable	Frequency (n=410)	Percentage (%)
Age		
11-13	73	17.8
14-16	172	41.6
17-19	165	40.2
Religion		
Christianity	376	91.7
Islam	34	8.3
Ethnicity		
Akan	61	14.9
Ewe	285	69.5
Hausa	20	4.9
Other	44	10.7
Level of Education		
Primary	68	16.6
JHS	151	36.8
SHS	191	46.6
Location (Sub-Municipality)		
Alavanyo	102	24.9
Fodome	102	24.9
Hohoe	104	25.4
Wli	102	24.9
Knowledge of BSE (ever heard of BSE)		
No	278	67.20
Yes	132	32.80

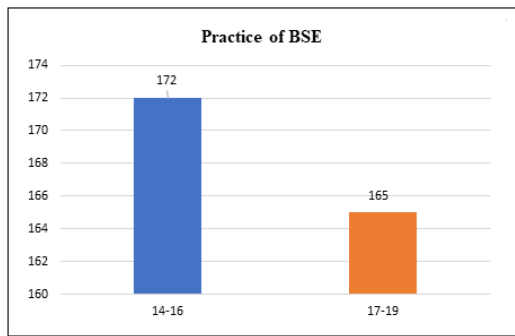


Figure 1. Practice of BSE among Participants

with findings from [23], who reported that while a substantial proportion of university students were aware of the importance of BSE, only 31.4% practiced it consistently. Similar observation has been reported by [24] who found that more than 50% of their respondents had poor practice of BSE. In Ghana, [7] also reported that just 37.6% of their participants engaged in BSE. These findings highlight a persistent gap between awareness and practice, suggesting that knowledge alone is insufficient to ensure regular BSE practice among women. Addressing this gap through targeted educational initiatives may improve BSE practices and assist in the broader fight against breast cancer.

The study found that women residing in the Hohoe suburb were 2.70 times more likely to practice BSE compared to those in other sub-municipalities. This finding can be plausibly explained by Hohoe's urban characteristics, particularly the presence of several tertiary institutions and a regional hospital. Tertiary institutions often function as centers for health education, awareness campaigns, and peer-led initiatives, which expose students and community members to preventive health information, including the importance of BSE [25]. Furthermore, the regional hospital in Hohoe likely conducts regular community outreach, cancer screenings, and health promotion activities focused on early detection of breast cancer. These resources provide residents with greater access to trained healthcare professionals and reliable health information, which fosters improved health literacy and proactive health-seeking behavior.

In contrast, adolescents in more rural sub-municipalities may face significant barriers such as limited access to healthcare services, fewer health education opportunities, and lower health literacy levels, all of which can negatively impact their engagement in BSE [26, 27]. Addressing these disparities through targeted breast cancer awareness campaigns, health education interventions, and improved healthcare access in rural areas could help bridge the gap in BSE practice. Ultimately, these efforts could contribute to earlier detection and better health outcomes for women across the municipality.

The study also revealed that adolescents who had prior knowledge of BSE were significantly more likely to practice it, with a 2.64-fold increase in odds compared to those who had never heard of BSE. This finding corroborates that of [28] who reported that knowledge on BSE is a key determinant of its practice. A recent

study by [29] also identified lack of knowledge as a major barrier to regular BSE practice among women. Similar observations have been reported by [30] in a study among Malaysian female adolescents, which found that inadequate knowledge significantly contributed to low BSE practice rates particularly among younger individuals. However, a study by [31] emphasized that increased body awareness through regular BSE enhances confidence in detecting breast changes, reinforcing the importance of education and awareness in promoting BSE. The findings of [32] further support these arguments highlighting the need for age-appropriate, targeted health education interventions aimed at adolescents to effectively bridge the gap between knowledge and implementation of BSE. Tailored strategies such as school-based health promotion, peer education, and interactive learning can play a vital role in improving BSE awareness and practice among this age group [33, 34].

Table 2. Practice of BSE among Participants

Variable	Frequency (n=410)	Percentage (%)
Have ever performed BSE		
No	294	71.7
Yes	116	28.3
Do you currently practice		
No	351	85.6
Yes	59	14.4
Last time performing BSE		
Can't remember	51	12.4
Last 3 month	15	3.7
Last month	37	9
Never	307	74.9
How often do you perform BSE		
Not at all	308	75.1
Once a month	53	12.9
Once a year	27	6.6
Once every six months	16	3.9
Twice a year	6	1.5
During what time do you perform		
Every week	15	3.7
Never	304	74.2
Once every 6 months	22	5.4
Once a month	59	14.4
Once every 12 months	10	2.4
What motivates you to perform		
A family died of breast cancer	30	7.3
Early detection of breast cancer	56	13.7
It's very convenient	324	79
Who helps you in performing		
Family member	14	3.4
Friends	8	2
Health practitioner	340	82.9
Nobody	48	11.7

Table 3. Factors Influencing BSE Practice among Participants

Variable	cOR [95% CI]	aOR [95% CI]
Age		
11-13	Ref.	Ref.
14-16	3.73 [1.40-9.91] **	-
17-19	3.15 [1.17-8.46] *	-
Religion		
Christianity	Ref.	Ref.
Islam	1.22 [0.51-2.91]	-
Ethnicity		
Akan	Ref.	Ref.
Ewe	1.23 [0.57-2.66]	-
Hausa	1.44 [0.39-5.32]	-
Others	1.70 [0.63-4.61]	-
Level of Education		
Primary	Ref.	Ref.
JHS	3.53 [1.34-8.39] *	-
SHS	1.92 [0.76-4.85]	-
Location (Sub-Municipality)		
Alavanyo	Ref.	Ref.
Fodome	0.73 [0.29-1.81]	-
Hohoe	2.25 [1.06-4.79] *	2.70 [1.16-6.26] *
Wli	2.84 [1.35-5.97] *	-
Knowledge of BSE (ever heard of BSE)		
No	Ref.	Ref.
Yes	2.81 [1.67-4.71] ***	2.64 [1.52-4.56] ***

*p < 0.05, **p < 0.01, ***p < 0.001; aOR: Adjusted Odd Ratio; cOR: Crude Odd Ratio

Limitations of the study

The cross-sectional design employed in this study limits the ability to infer causal relationships between variables. Additionally, self-reported responses may be subject to social desirability and recall bias, especially regarding BSE practice. Furthermore, the study was confined to one municipality, which may limit the generalizability of findings to other regions in Ghana or beyond.

In conclusion, the study highlights a concerning gap between awareness and practice of BSE among female adolescents in the Hohoe Municipality. Despite the proven importance of BSE in early breast cancer detection, only a minority of participants had adequate knowledge or engaged in the practice. Notably, urban residence (Hohoe suburb) and prior awareness of BSE were strong predictors of BSE practice. These findings emphasize the need for targeted, age-appropriate health education interventions, particularly in rural areas, to promote early cancer detection behaviors among adolescents. Strengthening school-based and community outreach programs could play a pivotal role in bridging the knowledge–practice gap and reducing the future burden of breast cancer in Ghana.

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Declaration

The Authors declare no conflicts of interest.

Ethics approval and consent to participate

The University of Health and Allied Sciences Research Ethics Committee (UHAS-REC) reviewed the study and approved it with a reference [ID: UHAS-REC A.10 [157] 22-23]. The study adhered to all methods in accordance with the Declaration of Helsinki. Permission was also obtained from the Hohoe Municipal Assembly before the commencement of the study. A written informed consent was obtained from participants aged 18 years and above while assent was sought from participant less than 18 years.

Data availability

All relevant data and materials from the study are available upon reasonable request.

Authors' contributions

The study was conceived and designed by MA and VOC. MA conducted the whole research work under the supervision of VOC. MA, VOC and SS analyzed the data collected from the field and SS wrote the initial draft of the manuscript. VOC, OKO and KMO provided the critical revision of the manuscript. VOC finalized the manuscript. All authors read and approved the final manuscript.

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