Innovative Journal of Medical and Health Science
Received 15 Aug 2020 | Accepted 27 Sep 2020 | Published Online 17 Oct 2020

DOI: https://doi.org/ttps://doi.org/10.15520/ijmhs.v10i10.3119
I Jour Med Health Science 10 (10), 1332–1345 (2020)
ISSN (O) 2589-9341 | (P) 2589-9341 IF:1.6

ORIGINAL ARTICLE

Knowledge of Breast Cancer Risk Factors and Practices of Breast Self-Examination among Women in Northern Ghana

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Abstract

Introduction: Breast cancer remains a major global health concern in both developed and developing countries. The current study aimed to assess the knowledge of breast cancer (BC) and the practice of breast self-examination (BSE) among females in the Tamale Metropolis of Northern Ghana. **Methods:** This is a cross-sectional study involving 1122 participants; consisting of nurses 157 (14.1%), teachers 227 (20.2%), undergraduate university students 339 (30.5%), medical students 95 (8.5%) and market women 304 (27.3%). Using a convenience sampling method to select the participants, we distributed questionnaires to participants; all were completed and returned. **Results:** Most of the participants, 498 (44.4%), were between 19-25 years of age. The majority were enlightened about BC (93.1%) and BSE (87.6%), 723 (64%) had good knowledge about the risk factors of BC. A total of 857 (76.4%) had previously been taught BSE. However, only 417 (37.2%) were found to practice BSE regularly. **Conclusion:** The knowledge of BC risk factors and BSE was remarkable but varied in the various occupational categories. However, only a few participants practiced BSE regularly. There is a need for widespread educational campaigns to educate further and encourage women to practice BSE regularly. The inclusion of men in these crusades is long overdue. Equipped with BSE's knowledge and skills, men could assist and encourage their spouses to frequently examine themselves. Further research studies will be necessary to ascertain the role of men in championing BSE.

Keywords: awareness, breast cancer, breast self-examination, knowledge, practice, Ghana, Tamale

Supplementary information The online version of this article(https://doi.org/10.15520/ijmhs.v10i10.3119 contains supplementary material, which is available to authorized users.

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INTRODUCTION

Breast cancer remains a major global health concern in both developed and developing countries [1,2]. It is currently the world's most common cancer and the leading cause of cancer deaths among women. In 2018 alone, it accounted for 11.6% (2,088,849) of all new cancer cases and 6.6% (626,679) of cancer deaths globally [3].

The incidence of breast cancer in low and middle-income countries (LMICs) such as Ghana is on the rise and has recently accounted for most cancer deaths in these areas (1). Poor health infrastructure, lack of awareness, among others, have been cited as some challenges accountable for the high mortalities in Africa [4,5].

Even though it is widely reported that the success rate of the treatment of breast cancer increases with early detection and treatment [6], delayed presentations are rampant, owing to personal factors [7], and in some cases, health system delays [8].

The breast's physical characteristics make breast cancer a few cancers that are easy to detect during its early development [2] through inexpensive methods such as breast self-examination (BSE). This method does not require any medical equipment or the involvement of a professional medical practitioner. However, it guarantees early detection of potentially dangerous breast lesions and empowers women to feel in control of their health, although a primary screening method. BSE can be practiced routinely by any woman who was taught how to and willing to do it.

A side from the BSE, other methods such as breast ultrasound, clinical breast examinations by a health professional, magnetic resonance imaging, and mammography are often used to screen for breast cancer [9].

Owing to the lack of access to health care facilities and the high cost associated with advanced screening methods, the BSE is recommended for women in low-resourced areas [4,10]. Even though it is not the most preferred test in early detection of breast cancer[11], BSE benefits women in knowing their breast's natural physical characteristics to identify any abnormal changes when they occur quickly. Both the American Cancer Society and the Canadian Cancer Society recommends that women be familiar with their breast's typical nature and report any changes to health care providers as soon as possible [11,12].

However, the BSE method seems not to be commonly practiced among most women since delayed breast cancer presentations remain a problem.

This current study, therefore, aims to assess the knowledge of breast cancer risk factors and the attitudes of participants towards the practice of breast self-examination among a subgroup of women in the Tamale Metropolis of Northern Ghana.

To our knowledge, no data have so far been published on this subject in our local setting comprising such a heterogeneous population. The findings will serve as a basis for comparisons in similar settings and inform policies directed at reducing the delay in breast cancer BC presentation at hospitals and educating the public about BSE.

METHODS

The current study was a cross-sectional descriptive study conducted in Tamale Metropolis using a convenience sampling method. Tamale is located in the northern part of Ghana and currently the largest city in the

entire area. The participants were recruited using a convenience sampling method in each of the population groups that were studied. The nurses and medical students who participated were selected from the only teaching hospital in the area — the teachers from four different schools. The university students were selected from a single school and the market women from one of the metropolis' main markets.

A questionnaire was designed based on previous literature and pretested on twenty-five nurses and medical students. A few modifications were made to the questionnaire after the pretest before it was used for the data collection. The questionnaire sought participants' demographic data, their knowledge and awareness of BC's risk factors, and the knowledge of BSE's good practice attitude.

The data collection was conducted from May 2017 to August 2017. We obtained ethical approval from the ethical review committee of Tamale Teaching Hospital, Ghana. Approval ID number TTHERC/17/11/16/05. Further permission was obtained from the various institutions that the data collection was to be conducted.

Before the commencement of the data collection, we informed the participants about the objectives of the study. Both verbal and written consent was obtained from each participant. Participants should be female, aged 19 years and above, and without BC to be included in this study. Females less than the set age criteria and with any type of breast disease were excluded.

Both the knowledge of BC's risk factors and BSE's good practice were categorized into poor and good. A score of 7.9 or less was classified as poor and greater than or equal to 8 was good knowledge. The total score for knowledge was 13. The highest score for practice was 6, the score for poor practice was 2.39, and for Good practice greater or equal to 2.4.

The data were entered into SPSS (SPSS Inc., Chicago, US) version 22 for analysis. Descriptive statistics were used to present data in percentages and frequencies. A univariate and multivariate logistic regression was used to determine predictors of the knowledge of BC's risk factors and the practice of BSE among the participants. A p-value of less than 0.05 was considered statistically significant in all tests.

RESULTS

Participant's Demographic Characteristics

A total of 1122 participants consisting of nurses 157 (14.1%), teachers 227 (20.2%), undergraduate university students 339 (30.5%), medical students 95 (8.5%) and market women 304 (27.3%) in Tamale metropolis. Of the total number, 498 (44.4%) were between age 19-25, with those aged 37-50 being the least, 147 (13.1%). About 612 (54.5%) of the respondents were single, 435 (38.7%) married, and 3 (0.3%) of respondents were co-habiting. A total of 447 (40.9%) and 87 (8%) of respondents were Orthodox and Ahmadis Muslims, respectively. Also, there were 193 (17.7%) members of Catholic, 147 (13.4%) Pentecost, and 147 (13.4%) Charismatic Christians (Table 1).

Table 1: Descriptive characteristic of participants

Variable	Frequency	Percentage
AGE		
19-25	498	44.4
26-36	271	24.2
37-50	147	13.1
>50	206	18.4
Total	1122	100
MARITAL STATUS		
Single	612	54.5
Married	435	38.8
Divorce	22	2.0
Widow	38	3.4
Co-habiting	3	0.3
Total	1110	99
RELIGION		
Orthodox Muslim	447	40.9
Ahmadis Muslims	87	8
Christian Catholic	193	17.7
Christian- Pentecostal	147	13.4
Christian-Charismatic	147	13.4
Other	72	6.6
Total	1093	100
OCCUPATION		
Teachers	227	20.2
Nurses	157	14.0
Medical student	95	8.5
University Students	339	30.2
Market women	304	27.1
Total	1122	100.0

Awareness

BC

Regarding the Awareness of BC, 1045 (93.1%) of the respondents had heard of BC, while the remaining 75 (6.7%) indicated they had never heard about it.

The mass media was the primary source of information to most 774 (37.6%) of the participants, followed by schools 501 (24.3%), hospital 398 (19.3%), friends 285 (13.8%) and churches/mosques 74 (3.6%). The remaining 29 (1.4%) indicated they did not know or cannot remember where they first heard about BC (Table 2).

Table 2: Awareness of breast cancer

HAVE YOU EVER HEARD OF BREAST CANCER		
	Frequency	Percentage
Yes	1045	93.1
No	75	6.7
WHERE DID YOU HEAR OF BREAST CANCER		
Do not Know	29	1.4
From Hospital	398	19.3
A Friend	285	13.8
Mass Media	774	37.6
Church/Mosque	74	3.6
School	501	24.3
Total	2061 (*includes multiple responses*)	100

BSE

For the awareness of BSE, 983 (87.6%) had prior knowledge, while 17 (1.5%) were unsure. Again, the mass media was the dominant source of information to most 603 (32.3%) of the participants, while churches/mosques were the least 113 (6.1%) (Table 3).

Table 3: General knowledge of breast self-examination

HAVE YOU HEARD OF BREAST SELF EXAMINATION		
	Frequency	**Percentage**
Not Sure	17	1.5
Yes	983	87.6
No	121	10.8
Total	1121	99.9
IF YES, WHERE DID YOU HEAR OF IT		
Hospital	433	23.2
Radio/Station	603	32.3
Church/Mosque	113	6.1
School	570	30.6
No Response	147	7.9
Total	1866	100
EVER BEEN TAUGHT HOW TO PERFORM BREAST SELF EXAMINATION		
Do not Know	23	2
Yes	857	76.4
No	241	21.5
Total	1121	99.9
IF YES, WHO TAUGHT YOU		
Doctor	250	18.7
Nurse	371	27.7
Teacher	228	17
Friend	127	9.5
Mass Media	363	27.1
Total	1339	100

We applied logistic regression to estimate the independent and combined effects of predictors, including age and occupation, against the knowledge of the practice of BSE (Table 4).

Table 4: Logistic regression of age and occupation against the knowledge of the practice of breast self-examination

		Practice Level					
Variable		**Poor N (%)**	**High N (%)**	**Crude OR (95% CI)**	**P-value**	**Adjusted OR (95% CI)**	**P-value**
Age	19-25	288(57.8)	210 (42.2)	1.00		1.00	
	26-36	152(56.1)	119 (43.9)	3.4 (2.3-5.13)	0.000	1.7 (1.2-2.5)	0.05
	37-50	95 (64.6)	52 (35.4)	3.7 (2.4-5.7)	0.000	1.6 (0.97-2.5)	0.065
	>50	170 (82.5)	36 (17.5)	2.6 (1.6-4.2)	0.000	0.38 (0.24-0.6)	0.000
Occupation	Teachers	146(67.3)	71 (32.7)	1.00		1.00	
	Nurses	64 (40.8)	93(59.2)	2.9 (1.9-4.6)	0.000	2.7 (1.7-4.4)	0.000
	Medical students	65 (68.4)	30 (31.6)	0.95 (0.6-1.6)	0.843	1.0 (0.56-1.8)	0.982
	University students	181 (53.4)	158 (46.6)	1.79 (1.3-2.6)	0.001	1.87 (1.19-2.9)	0.006
	Market women	243 (80)	61 (20)	0.5 (0.35-0.77)	0.001	0.4 (0.26-0.61)	0.000

In the Univariate analysis across all levels, the age group was significant. Women of ages 26-36, 37-50, and >50 had about 2.3, 1.8, and 1.7 times more likely to be knowledgeable about the risk factors of breast cancer compared to those aged 19-25. Except for >50 years of age, the rest of the age groups maintained significance in the multiple regression model (Table.5).

Table 5: Logistic regression of demographics against the knowledge of risk factors of breast cancer

		Knowledge Level					
Variable		**Poor N (%)**	**High N (%)**	**Crude OR (95% CI)**	**P-value**	**Adjusted OR (95% CI)**	**P-value**
Age	19-25	150(30.1)	348(69.9)	1.00		1.00	
	26-36	94 (34.7)	177(65.3)	2.3 (1.6 –3.2)	0.000	1.7(1.1 – 2.5)	0.01
	37-50	53 (36.1)	94 (63.9)	1.8 (1.3- 2.6)	0.001	1.9 (1.2-3.2)	0.005
	>50	102(49.5)	104 (50.5)	1.7 (1.1-2.7)	0.012	0.9(0.64 – 1.47)	0.894
Occupation	Teachers	138(63.6)	79 (36.4)	1.00		1.00	
	Nurses	40 (25.5)	117 (74.5)	0.32(0.2-0.5)	0.000	5.5 (3.3-92)	0.000
	Medical student	24 (25.3)	71 (74.7)	1.64 (1.1-2.5)	0.025	6.6 (3.6-12.3)	0.000
	University student	85 (25.1)	254 (74.9)	1.65 (0.9- 2.8)	0.057	6.3 (3.9-10.1)	0.000
	Market woman	109(35.9)	195 (64.1)	1.67 (1.2-2.3)	0.003	3.2 (2.2-4.8)	0.000
Religion	Orthodox Muslim	184(41.2)	263 (58.8)	1.00		1.00	
	Ahmadis Muslim	40(46.0)	47 (54.0)	0.38(0.21-0.69)	0.01	0.90 (0.56-1.5)	0.679
	Christian Catholic	61 (31.6)	132 (68.4)	0.31(0.15-0.63)	0.01	1.3 (0.8-1.9)	0.266
	Christian Pentecost	51(34.2)	96 (65.3)	0.57 (0.30-1.1)	0.08	0.9(0.64-1.5)	0.949
	Christian Charismatic	37 (25.2)	110 (74.8)	0.49(0.26-0.96)	0.038	1.6 (0.98-2.4	0.059
	Others	15 (20.8)	57 (79.9)	0.8(0.39-1.5)	0.48	2.3(1.2-4.3)	0.01
Marital status	Single	180(29.4)	432(70.6)	1.00		-	-
	Married	188(43.2)	247(56.8)	1.2 (0.1-13.3)	0.88	-	-
	Divorce	6 (27.3)	16 (72.7)	0.66(0.1-7.3)	0.73	-	-
	Widow	20 (52.6)	18 (47.4)	1.33 (0.1-17.6)	0.83	-	-
	Co-habiting	1 (33.)	2 (66.7)	0.45 (0.04-5.4)	0.52	-	-

Knowledge

BC risk factors

Among the participants, 723 (64%) had good knowledge of BC's risk factors (Table 6). Nine out thirteen questions (69%) regarding knowledge of BC were answered correctly (Table 7). Of the wrongly answered questions, 69.1% did not agree that BC is associated with old age, 52.4% did not agree that the birth of a first child after age 30 is a risk factor. Also, most (57.4%) of the participants disagreed that the early onset of menarche is a risk factor, the majority (49.5%) believe that the late start of menopause is not a risk factor of BC.

Table 6: Knowledge of risk factors of breast cancer and the attitudes and practices of breast self-examination

Knowledge of risk factors of BC	Frequency	Percentage
Poor knowledge of risk factors	399	35.6
Good Knowledge of risk factors	723	64.4
Practice of BSE		
Poor knowledge of the Practice of BSE	705	62.8
Good knowledge of the practice of BSE	417	37.2

Table 7: Knowledge of risk factors of breast cancer

Question	Frequency	Percentage
Breast cancer affects only women		
Do not Know	25	2.2
TRUE	714	63.6
FALSE	382	34
Breast cancer can be transmitted by sexual contact		
Do not Know	20	1.8
TRUE	75	6.7
FALSE	1026	91.4
Positive family history of breast cancer is a risk factor		
Do not Know	45	4
TRUE	782	69.7
FALSE	294	26.2
Breast cancer is commonly associated with old age		
Do not Know	25	2.2
TRUE	321	28.6
FALSE	775	69.1
Births of a first child after 30 years is a risk factor		
Do not Know	76	6.8
TRUE	457	40.7
FALSE	588	52.4
Early-onset of menses, i.e., before 12 years		
Do not Know	62	5.5
TRUE	415	37
FALSE	644	57.4
Late-onset of menopause after age 55 years		
Do not Know	76	6.8
TRUE	490	43.7
FALSE	555	49.5
Being a woman is a risk factor		
Do not Know	21	1.9
TRUE	904	80.6
FALSE	196	17.5

Cigarette smoking is a risk factor		
Do not Know	54	4.8
TRUE	850	75.8
FALSE	217	19.3
The eating of a low-fat diet is a risk factor		
Do not Know	83	7.4
TRUE	187	16.7
FALSE	851	75.8
Exposure to radiation is a risk factor		
Do not Know	45	4
TRUE	934	83.2
FALSE	142	12.7
The use of oral contraceptives is a risk factor		
Do not Know	48	4.3
TRUE	562	50.1
FALSE	510	45.5
Regular sexual activities increase the risk of breast cancer		
Do not Know	49	4.4
TRUE	165	14.7
FALSE	906	80.8

BSE

When asked whether the participants had ever received any BSE training, 857 (76.4%) agreed they had ever been taught to perform BSE. In comparison, 241 (21.5%) answered no. Nurses taught most 371 (27.7%) of the participants how to perform BSE, followed closely by the mass media 363 (27.1%). A good number 464 (41.4%) of the respondents knew that BSE should be performed right after menstruation, whereas 172 (15.3%) did not know when to, 36 (3.2%) answered BSE should be performed during menstruation.

Practice of BSE

Of the entire study population, only 417 (37.2%) had a good knowledge of the practice of BSE (Table 6).

Most of the participants, 714 (63.3%), had ever performed BSE themselves, whereas 384(34.2%) never performed it. A good number 293 (41%) of the respondents reported that they performed BSE only when they feel like doing so, while 30 (4.2%) said they performed it every six months.

Across all age groups, the practice increased with increasing reproductive age. Women within the age groups of 26-36 and 37-50 each had about a 200% increase in BSE practice knowledge than 19-25, while it decreased after 50 years. In the multiple regression model, age groups 26-36 and 37-50 maintained marginal significance. Additionally, except for being a medical student with no significance, all other participants' groups were significant. Thus, while the nurses were 2.9 times more likely to practice BSE compared to the teachers, the university students will practice BSE 1.7 times compared to teachers. However, market women practice BSE 0.5 times or 50% less than

teachers. The significance declined marginally in the multiple regression models (Table 5).

DISCUSSION

This current study assessed the knowledge of BC's risk factors and the practice of breast self-examination among some groups of female Ghanaians, namely; Nurses, teachers, undergraduate university students, medical students, and market women.

In general, most of the participants reported that they had prior knowledge about BC's risk factors. This finding is similar to previous studies [13,14], unlike others that reported poor knowledge of the risk factors of BC in parts of Nigeria [15,16] and Egypt [17]

The participant's knowledge of BC's risk factors was impressive; 69 % of the thirteen risk factor questions were answered correctly. This finding is contrary to that of a similar study conducted in Ghana [18] and Sri Lanka [19], yet congruent with studies conducted in Uganda [20] and Poland [21].

Breast cancer is a significant public health concern. It is not surprising, however, that most participants were well informed about the disease. The vast Awareness of BC could mean that participants are more likely to seek early treatment upon noticing BC's first signs. Therefore it would be of great benefit to the public if over 95% of the study population is well informed.

Comparisons among the participants showed that teachers were the group with the least level of Awareness of BC. Interestingly, both university students and market women were much more aware of BC than medical students. However, this difference was not significant, probably due to numbers. This is a surprising outcome because, as medical students, many would argue that they are more exposed and updated regarding health information. However, this finding could also be due to bias resulting from the medical students' sample size. The students were mostly preclinical students who do not know clinical problems like breast cancer, just like any other undergraduate student. Studies have previously demonstrated a possible link between the knowledge of BC risk factors and professionalism [15]. In their research, Ibrahim and Odusanya reported that female medical doctors' mean score of BC knowledge was 74%, while other professionals like nurses and allied health professionals scored 35% and 31%, respectively. This vast difference was mainly attributed to the participants' professional affiliation, posited by the researchers [15].

The awareness of BSE among the participants in this study was widespread, with 87% of the study participants having prior knowledge of BSE. High awareness of BSE has previously been reported by studies conducted in Malaysia [22], Palestine [23], Ethiopia [24], and Nigeria [25], whereas other studies conducted in Turkey [26] reported low Awareness.

The mass media was the primary source of information for most participants, as earlier reported by previous studies [17,23]. The mass media can be a useful tool in educating the public on public health concerns and should, therefore, be explored and used to the general public's advantage. The ministry of health and other stakeholders should take advantage of this outlet since the patronage and its effectiveness is high.

We found that professional nurses contributed most to teaching a majority of the participants how to perform BSE. Nursing roles have often extended beyond clinical activities, even though such extended roles are not official paid duties in some circumstances. However, the

impact of such sacrificial engagements cannot be overemphasized. Nurses have many contact hours with clients than most other health service personnel; this proximity gives nurses an added advantage in building professional relationships. Therefore, it would be prolific to encourage and support nurses to effectively engage in public health education/awareness campaigns as an add-on duty.

In this study, teachers were the least aware of BSE, yet they equally stand a higher chance of being the professionals who could educate most people about BSE's best practices due to their job description. This calls for action in equipping such groups with the requisite skills to champion awareness campaigns. Contrary to this finding, Kumarasamy et al., in their study among rural women in India, reported an association between Awareness of BSE and educational levels [27].

Regarding BSE practice, our findings revealed that only 37.2% practiced BSE regularly, although many (87.6%) were aware of BSE. A similar study conducted in Ghana reported a 90.9% awareness rate, with only an 8.1% practice rate among the participants [28]. This worrying trend has been widely reported [22,23,25,29,30]. The Awareness of BSE is essential and should translate into good practice; this is the only way its benefits of aiding early detection in low resourced areas would be noted. We were confident that high awareness levels would correlate with the right practice attitude. This turn of events depicts a need for an intensified educational campaign with emphasis on good practice behaviors.

Contrary to our findings, a previous study conducted among healthcare professionals in Nigeria reported that 95% of the study participants practiced BSE at least once every month [12,28] compared to 38.9% in this current study. These disparities could be attributed to the fact that our research was carried out on a diverse population rather than solely on healthcare workers, contrary to these studies.

However, market women in this current study had poor practice attitude (20%) compared to nurses (59.2%), university students (46.6%), and medical students (31.2%). This supports previous studies' findings that highlighted the association between occupation, educational level, and BSE practice [22,31].

We found that BSE's practice improved with increasing age among the participants after 25 years and declined after age 50. This finding supports the ongoing debates about the link between age and BSE practice [32,33]. Many researchers have consistently listed higher health motivation, higher perceived self-efficacy, and marital status as essential predictors of BSE practice among women [34–37].

CONCLUSION

The knowledge of BC’s risk factors and BSE was remarkable but varied in the various occupational categories. However, only a few participants reported they practiced BSE regularly.

There is a need for widespread educational campaigns to educate and encourage women on the regularly practice of BSE. The inclusion of men in these crusades is long overdue. Equipped with BSE's knowledge and skills, men could assist and encourage their spouses to frequently examine themselves. Further research studies will be necessary to ascertain men's role in championing BSE.

What is already known on this topic

- The knowledge of breast cancer and the risk factors is abysmal among many African communities
- The majority of women in Africa do not practice regular breast self-examination

What this study adds

- This study adds to the current scientific body of knowledge on the attitudes of African women regarding breast self-examination
- The awareness of breast self-examination is not a guarantee of good practice attitude
- There is a need for intensive public education on breast cancer and the regular practice of breast self-examination

Competing interests

The authors declare no competing interest.

Authors' contributions

Conceptualization, ADBB, YT, and ST; Data curation, WJS, and HH; Formal analysis, WJS and H. H.; Investigation, ADBB, and HH; Methodology, ADBB, YT, and ST; Project administration, ADBB, YT, and ST; Supervision, ADBB, YT, and ST; Writing – original draft, ADBB, and WJS; Writing – review & editing, ADBB, WJS, H. H., Y. T. and ST

Acknowledgments

We wish to thank the authorities of the various institutions that permitted us to conduct this study at their premises.

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