Knowledge, Attitude and Practice about Breast Cancer among Women in Saudi Arabia

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Abstract

Objectives: Breast cancer is accounted for 25% of all newly diagnosed female cancers in KSA. The purpose of this study was to assess knowledge, attitude and practice about breast self-examination (BSE), clinical breast examination (CBE) and mammography as early detection tools for breast cancer among females in Saudi Arabia.

Methods: A standardized, confidential, Internet questionnaire was conducted on 764 Saudi Arabian women aged from twenty to above sixty years old in March, 2015. An association of knowledge and practice of BSE, CBE and mammography with age, education level and marital status was investigated.

Results: Out of 764 participants, only 159 (20.81%), 151(19.76%) and 99 (12.96%) practiced BSE, CBE and mammography respectively. The knowledge and practice of CBE and mammography were significantly decreased with increasing the age. The married women showed significantly more practice of BSE, CBE and mammography than single ones (OR: 1.6 (1.1-2.3), $P < 0.014$; OR: 3.7 (2.4-5.8), $P < 0.00001$ and OR: 4.2 (2.4-7.2), $P < 0.00001$ respectively).

Conclusion: The study points to the insufficient knowledge of female about breast cancer and identified the negative influence of low knowledge on the attitude and practice of BSE, CBE and mammography. Therefore, more efforts are needed to develop a positive attitude toward BSE, CBE and mammography screening practice in the country.

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Keywords

Breast Cancer, Breast Self-Examination; Clinical Breast Examination; Mammography

Introduction

Breast cancer (BC) is considered to be one of the most common malignancies and the second leading cause of cancer deaths in women after lung cancer, worldwide. The breast cancer forms about 23% of all female cancers [1, 2, 3]. The breast cancer is ranked as the most common cancer in females according to the Saudi Cancer Registry (SCR). It is accounted for 25% of all newly diagnosed female cancers in KSA [4].

Early breast cancer stage is usually asymptomatic. As the tumor grows, main symptoms are breast lump or lump in the armpit that is hard, has uneven edges, and usually does not hurt. Also, change in the size, shape, or feel of the breast or nipple (redness, dimpling, puckering that looks like the skin of an orange, fluid from the nipple may be bloody, clear to yellow, green, or look like pus). On the other hand, the symptoms of advanced breast cancer may exhibit the following symptoms; bone pain, breast pain or discomfort, skin ulcers, swelling of the lymph nodes in the armpit and weight loss [5, 6].

Numerous risk factors are associated with breast cancer. One major risk factor is increasing age. The most important ones include both a personal and a family history of breast cancer and some specific genetic mutations and hyperplasia. Other risk factors are an early menarche and late menopause, obesity after menopause, use of iatrogenic hormones (both oral contraceptives and postmenopausal hormone therapy have been implicated), nulliparity or having the first child after the age of thirty [7, 8].

Early detection of breast cancer can be achieved by performed breast self-examination (BSE), clinical breast examination (CBE) and mammography [9]. It is important to adequately motivate women to regularly carry out BSE so as to curtail the increasing mortality rate from breast cancer [10]. The practice of BSE may have great value in terms of awareness and motivating women to see a health care provider when they find a lump. Also, the earlier response

to symptoms may reduce the cancer stage at diagnosis. In addition, BSE may be an effective primary tool in breast health education [11].

Therefore, the education of women about the warning signs, symptoms and strive for improvement of health behavior by making them aware are important steps to drag down high incidence and mortality rate from breast cancer. In this regard, different professions like medical professionals, media, academic teachers and leaders can play a vital role to educate people [12]. The main goal of the present work was to assess knowledge, attitude and practice about breast self-examination, clinical breast examination and mammography as early detection tools for breast cancer among females in Saudi Arabia, to compare the findings of the study with the related studies done in other places and to help in designing a proper health education scheme regarding breast cancer.

Design of the Work

A national adaptive cross-sectional survey [13, 14] was conducted on 764 Saudi Arabian women aged from twenty to above sixty years old in March, 2015. A standardized, confidential, Internet questionnaire (An electronic questionnaire was used for a large population of women in all regions of Saudi Arabia) was offered to randomly selected female members.

Inclusion criteria:

- 1) Age 20-70 year.
- 2) Only Saudi Arabian female involved in the study.

Questionnaire Design

The questionnaire was designed in English with later translated to Arabic and reviewed for consistency by the supervisor. The questionnaire included Socio-demographic characteristics of the participants and questions on awareness campaign in Saudi Arabia followed by twenty questions related to knowledge (Family history, risk factors, symptoms, prevalence and importance of early de-

tection). Also, questionnaire included other items regarding to attitude toward and practice of BSE, CBE and mammograph.

Data analysis

The data were collected and tabulated. The recorded data were analyzed using computer based statistical package for social science (SPSS, V.22, IBM Corp., USA, 2013).

Simple descriptive statistics were used (frequency with percentage distribution for categorized variables). Chi-square cross tabulation was used to test the differences in proportions of categorical variable between two or more groups and assess/find correlation between the variables. Odds ratio (OR) together with 95% confidence intervals (95% CIs) were used to measure the association between variables. The level of statistical significance was set at probability $P \leq 0.05$.

Results

Seven hundred and sixty four questionnaires were received complete and considered for the analysis.

Table 1 showed the socio-demographic characteristics of the participants. The majority of participants, four hundred fifteen (54.32%), were between 20 to 30 years of age followed by 209(27.36%) who were between the age group of 31 to 40 years. Four hundred thirty nine (57.46%) were married, 325(42.54%) were single. Majority of the participants, 496(64.92%) had a university bachelor degree, 81(10.60%) had high school diploma, and 46(6.02%) participants had higher educational qualifications (masters and PhD degrees).

Perception of breast cancer, knowledge of awareness campaigns in Saudi Arabia, family history of breast cancer and the importance of early detection in improvement of treatment were represented in **Table 2**. Several activities, events, and campaigns took place to promote better knowledge and encourage early detection throughout the country.

Table 1. Socio-demographic characteristics of participants (n=764).

Characteristics	N	%
Age (years)		
20-30	415	54.32
31-40	209	27.36
41-50	99	12.96
51-60	39	5.10
Above 60	2	0.26
Education		
Average	17	2.22
Secondary	124	16.23
Diploma	81	10.60
Bachelor	496	64.92
High education	46	6.02
Occupation		
Don't work	148	19.37
Students	258	33.77
Part Time	33	4.32
Full Time	241	31.54
From Home	55	7.20
Retired	29	3.80
Marital Status		
Single	439	57.46
Married	325	42.54
Area of Residence		
Western Region	41	5.37
Eastern Region	22	2.88
Central Region	666	87.17
Southern Region	21	2.750
Northern Region	14	1.83
Total	764	100
Some results are expressed as percentages (%), (N): Number of participants		

Table 2. Participants' perception about breast cancer, family history, awareness campaigns and importance of early detection in the treatment.

Questions	N		%
Do you think that breast cancer leads to death?	Yes	354	46.34
	No	274	35.86
	I don't know	136	17.80
Do you have any family history of breast cancer?	Yes	137	17.93
	No	585	76.57
	I don't know	42	5.50
Are you aware of breast cancer campaigns and activities?	Yes	249	32.59
	No	346	45.29
	I don't know	169	22.12
Do you think that the early detection improves the treatment of breast cancer?	Yes	741	96.99
	No	4	0.52
	I don't know	19	2.49
Total	764		100
Some results are expressed as percentages (%), (N): Number of participants			

Table 3. Breast cancer risk factors, signs and symptoms identified by the participants.

	N	%
Risk factors		
Advanced age	400	52.36
Family history with breast cancer	493	64.53
Smoking	528	69.11
Obesity	333	43.59
Delivery of first child after the age of 30	187	24.48
Early menstruation	85	11.13
Late menopause	215	28.14
Short periods of breast feeding	14	1.83
Use of contraceptive pills	356	46.60
Signs and symptoms		
Bloody discharge from nipple	579	75.79
Lump in breast	707	92.54
Change in breast skin	639	83.64
Some results are expressed as percentages (%), (N): Number of participants		

Two hundred forty nine (32.59%), have recognized that. Three hundred fifty four (46.34%), 137(17.93%) and 741 (96.99%) of participants have knowledge about the possibility of death by breast cancer, family history of breast cancer and knowledge of the improvement of breast cancer treatment by early detection respectively.

When asked about the risk factors of breast cancer. These factors were presented in **Table 3**. The most identified risk factor was smoking 528 (69.11%) followed by family history 493 (64.53%). While the least identified factor was short periods of breast feeding 14 (1.83%). The majority of risk factors were identified by women 30 years of age or younger. While, women over 60 years only managed to identify 2 to 3 risk factors. On the other hand, when asked about signs and symptoms of breast cancer the most identified symptoms was lump in the breast 707 (92.54%) followed by change in breast skin 639 (83.64%).

Results from the three main questions that assessed participants' knowledge on BSE and mammography practice were shown in **Table 4**. Six hundred fifty seven (85.99%) admitted BSE usefulness in early detection of breast cancer. On the other hand, 666 (87.17%) admitted CBE usefulness in early detection of breast cancer. Four hundred seventy six (62.30%) admitted mammography usefulness in early detection; however, only 257 (33.64%) identified the correct age for screening. In addition, 406 (53.14%) of the participants recognized the correct screening frequency.

Figure 1 showed positive attitude toward Breast Self-Examination where 651(85.21%) of participants recommend their family to do that examination.

When asked about reasons for prevention of getting medical advice, the highest percentage 244 (31.94%) of chosen barrier was "worry about finding a lump" followed by 194 (25.39%) "no time". While the last percentage twenty (2.62%) was "going to a doctor or hospital will not help me", as demonstrated in **Figure 2**.

Table 4. Knowledge about BSE, CBE and mammography practices.

Questions	N	%
BSE		
How is your general knowledge about BSE?		
Excellent/Good	81	10.60
Fair	202	26.44
Poor	316	41.36
I don't know	165	21.60
Do you think that BSE is very useful for early detection of breast cancer?		
Yes	657	85.99
No	107	14.01
Which of the following is appropriate time for BSE?		
Few days before menses	51	6.68
Few days after menses	287	37.57
During menses	51	6.68
No specific time	157	20.55
Don't know	218	28.53
Total	764	100
CBE		
If you feel a lump in breast, do you know the importance of CBE?		
Yes	666	87.17
No	98	12.83
Total	764	100
Mammography		
How is your general knowledge about mammography?		
Excellent/Good	99	12.96
Fair	112	14.66
Poor	163	21.34
I don't know	390	51.05
Do you think that mammography is very useful for early detection of breast cancer?		
Yes	476	62.30
No	288	37.69

Questions	N	%
Mammography		
When should a woman start having mammograms?		
15-20 years	39	5.10
21-30 years	155	20.29
30-40 years	273	35.73
Over 40 years	257	33.64
Over 50 years	40	5.24
At what frequency should a woman have her mammograms?		
Every year to two years	406	53.14
Every five years	79	10.34
When a doctor request it	149	19.50
I don't know	130	17.02
Total	764	100
Some results are expressed as percentages (%), (N): Number of participants		

Figure 1: Attitude toward Breast Self-Examination. **Figure 2:** Attitude toward Clinical Breast Examination.

Figure 3: Attitude toward Mammography, Mammography barriers. **Figure 4:** Attitude toward Mammography, feeling before the appointment. **Figure 5:** Practices of breast self-examination, clinical breast examination and mammogram.

When asked about reasons for not going through mammogram screening tests if within the screening age, the highest percentage of chosen barrier hundred eighty nine (24.74%) was “I don't have any problem and I think it is not important” followed by 180 (23.56%) “Worry about the results”, as illustrated in **Figure 3**. Assuming that their mammogram appointment was the following day, participants were asked to describe their feelings. **Figure 4** summarized their answers. “Worried about the results” represented the highest percentage 348 (45.55%) of feeling before the appointment. While the “lack of desire to go” forty nine (6.41%) represents the least one.

As illustrated in **Figure 5**, out of 764 participants, only 159 (20.81%), 151 (19.76%) and ninety nine (12.96%) practiced BSE, CBE and mammogram respectively. Consequently, BSE was the most method used for detection of breast cancer in comparison to CBE and mammography.

Tables 5.1 and **5.2** showed that the knowledge of BSE by women having bachelor was significantly more 436 (57.1%) than the lower level of education 11 (1.5%) (OR: 4 (1.4 - 11.1), $P < 0.031$). On the other hand, the knowledge about CBE and mammograph was significantly decreased with increasing the age. However, women ranged from 41-50 years had less knowledge of CBE and mammograph by about more than twice in comparison to women aged from 20-30 years. (OR: 2.5 (1.1 - 5.7), $P < 0.046$) and (OR: 2.4 (1.5 - 3.9), $P < 0.0002$ respectively). On comparing the married and single women, the married women showed significantly more knowledge of CBE and mammograph, about three times and twice respectively (OR: 2.9 (1.9 - 4.6), $P < 0.0001$) and (OR: 1.6 (1.2 - 2.1), $P < 0.003$ respectively).

As illustrated in **table 6.1** and **6.2**, the practice of BSE was significantly decreased with increasing the age. And thus, women ranged from 51-60 years 15 (1.96%) had less practice of BSE by about more than three times in comparison to younger ones

Table 5.1. Knowledge of BSE, CBE and mammograph by various socio-demographic characteristics.

Characteristics	BSE				CBE				Mammograph			
	Yes (n=657)		No (n=107)		Yes (n=666)		No (n=98)		Yes (n=476)		No (n=288)	
	N	%	N	%	N	%	N	%	N	%	N	%
Age (years)												
20-30	349	45.7	66	8.7	348	45.5	67	8.8	229	30	186	24.4
31-40	188	24.6	21	2.8	188	24.6	21	2.7	143	18.7	66	8.6
41-50	86	11.3	13	1.7	92	12	7	0.9	74	9.7	25	3.3
51-60	32	4.2	7	0.9	36	4.7	3	0.4	28	3.7	11	1.4
Above 60	2	0.3	0	0	2	0.3	0	0	2	0.3	0	0
X ² (P value)	4.852 (0.303)				9.676 (0.046)*				21.528 (0.0002)*			
Education												
Average	11	1.5	6	0.8	12	1.6	5	0.7	11	1.5	6	0.7
Secondary	101	13.2	23	3	105	13.7	19	2.4	72	9.4	52	6.9
Diploma	71	9.3	10	1.3	75	9.8	6	0.8	54	7.1	27	3.5
Bachelor	436	57.1	60	7.9	434	56.8	62	8.2	310	40.6	186	24.4
High education	38	5.0	8	1	40	5.2	6	0.8	29	3.8	17	2.2
X ² (P value)	10.645 (0.031)*				7.049 (0.133)				1.666 (0.797)			
Marital Status												
Single	271	35.5	54	7.1	261	34.2	64	8.4	183	24.0	142	18.6
Married	386	50.5	53	6.9	405	53.0	34	4.4	293	38.4	146	19.1
X ² (P value)	3.2 (0.074)				23.839 (0.0001)*				8.658 (0.003)*			
Some results are expressed as percentages (%), (N): Number of participants, X2, Chi square, *: Significant result, the result is significant at P ≤ 0.05.												

Table 5.2. Knowledge of BSE, CBE and mammograph by various socio-demographic characteristics.

Characteristics	BSE	CBE	Mammograph
Age (years)			
20-30 ^R	NS	1	1
31-40		1.7 (1 - 2.9)	1.8 (1.2 - 2.5)
41-50		2.5 (1.1 - 5.7)	2.4 (1.5- 3.9)
51-60		2.3 (0.7 - 7.7)	2.1 (1 - 4.3)
High education		40	29
Education			
Average ^R	1	NS	NS
Secondary	2.4 (0.8 - 7.1)		
Diploma	3.9 (1.2 - 12.8)		
Bachelor	4 (1.4 - 11.1)		
High education	2.6 (0.7 -9.1)		
Marital Status			
Single ^R	NS	1	1
Married		2.9 (1.9 - 4.6)	1.6 (1.2 - 2.1)
R: Reference category, OR: Odds ratio, CI: Confidence intervals, NS: Non significant result			

Table 6.1. Practice of BSE, CBE and mammograph by various socio-demographic characteristics.

Characteristics	BSE				CBE				Mammograph			
	Yes (n=159)		No (n=605)		Yes (n=151)		No (n=613)		Yes (n=99)		No (n=665)	
	N	%	N	%	N	%	N	%	N	%	N	%
Age (years)												
20-30	67	8.76	348	45.5	32	4.18	383	50.1	16	2.09	399	52.2
31-40	46	6.02	163	21.3	58	7.59	151	19.8	27	3.53	182	23.8
41-50	30	3.92	69	9	42	5.49	57	7.4	38	4.97	61	8
51-60	15	1.96	24	3.2	17	2.22	22	2.9	17	2.22	22	2.9
Above 60	1	0.13	1	0.1	2	0.26	0	0	1	0.13	1	0.1
X ² (P value)	19.484 (0.0006)*				100.563 (0.0001)*				122.108 (0.0001)*			
Education												
Average	2	0.26	15	2	3	0.39	14	1.8	3	0.39	14	1.8
Secondary	28	3.66	96	12.6	21	2.74	103	13.5	19	2.48	105	13.7
Diploma	21	2.74	60	7.8	23	3.01	58	7.6	15	1.96	66	8.7
Bachelor	100	13.08	396	51.8	97	12.69	399	52.3	60	7.85	436	57.1
High education	8	1.04	38	5	7	0.91	39	5	2	0.26	44	5.8
X ² (P value)	2.819 (0.589)				5.092 (0.278)				6.516 (0.164)			
Marital Status												
Single	54	7.06	271	35.5	30	3.92	295	38.7	17	2.22	308	40.3
Married	105	13.74	334	43.7	121	15.83	318	41.6	82	10.73	357	46.7
X ² (P value)	6.043 (0.014)*				39.575 (0.0001)*				29.944 (0.0001)*			
Some results are expressed as percentages (%), (N): Number of participants, X ² , Chi square, *: Significant result, the result is significant at P ≤ 0.05.												

Some results are expressed as percentages (%), (N): Number of participants, X², Chi square,
*: Significant result, the result is significant at P ≤ 0.05.

Table 6.2. Practice of BSE, CBE and mammography by various socio-demographic characteristics.

Characteristics	BSE	CBE	Mammograph
Age (years)			
20-30 ^R	1	1	1
31-40	1.5 (1- 2.2)	4.6 (2.9- 7.4)	3.7 (1.9 - 7)
41-50	2.3 (1.4 - 3.7)	8.8 (5.2 - 15.1)	15.5 (8.2 - 29.6)
51-60	3.2 (1.6 - 6.5)	9.2 (4.5-19.2)	19.3 (8.6 - 43.2)
Education			
Average ^R	NS	NS	NS
Secondary			
Diploma			
Bachelor			
Marital Status			
Single ^R	1	1	1
Married	1.6 (1.1- 2.3)	3.7 (2.4 - 5.8)	4.2 (2.4 - 7.2)
R: Reference category, OR: Odds ratio, CI: Confidence intervals, NS: Non significant result			

R: Reference category, OR: Odds ratio, CI: Confidence intervals, NS: Non significant result

67 (8.76%) (OR: 3.2 (1.6-6.5), $P < 0.0006$). Concerning the practice of CBE and mammograph, it was found that the women aged from 41-50 years were significantly practiced CBE and mammograph more than 20-30 aged ones ($P < 0.0001$). On the other hand, the married women showed significantly more practice of BSE, CBE and mammograph than single ones by about twice, more than three and four times respectively (OR : 1.6 (1.1-2.3), $P < 0.014$; OR :3.7 (2.4-5.8), $P < 0.0001$ and OR: 4.2 (2.4-7.2), $P < 0.0001$ respectively).

Discussion

In Saudi Arabia, social and demographic factors have influenced the late presentation of the disease [15]. The average age at the presentation of breast cancer in Arab countries appears to be a decade earlier than in Western countries. If this is true, this has important implications for screening and cancer management strategies in these countries, including the ideal age at which to begin screening. Adoption of Western guidelines "without critical amendment" in planning breast cancer programs will waste the resources without achieving desired outcomes. Determination of the true frequency and age of onset of breast cancer in Arab women should be an important research priority [16].

Three hundred and seventy six female teachers from 20 schools in the central region of Saudi Arabia were surveyed. Ninety percent of them were found to have poor knowledge and wrong beliefs. The subjects had the same level of education, income, background and all lived in the same city [17]. The study reported that only 9.3% of teachers identified mammography as a screening method. Another study that took place in the same region included 149 nursing students from two colleges, showed that 66% practiced BSE on regular basis and confirmed a positive relationship between perception and years of experience [18]. Due to their

specialty, 44% of the participants learned about BSE from their college curriculum. As evident from the existing literatures, studies on breast cancer screening and mammography in Saudi Arabia, have so far been done within a controlled population (i.e. at universities, colleges or schools within one region), which resulted in no variation in age, education level, occupation, region of residence of the participants.

Ideally, awareness and educational campaigns should target population of all ages to reinforce the importance of early screening. The present study has managed to research electronically diverse women in the western, eastern, central, southern and northern regions of the country [14]. The present study included women in all regions of Saudi Arabia and evaluated their awareness about breast cancer, risk factors, signs, symptoms, BSE, CBE and mammography. Also, the present work evaluated BSE, CBE and mammography attitude and screening practice.

In the present study, 92.54% of the studied population knew that a breast lump could be a warning sign of breast cancer. In another study among a Nigerian population, only 33% of population identified that a breast mass is the commonest symptom of breast cancer [19]. In the present work, 75.79% participants answered correctly when they asked about bloody discharge from nipple and 83.64% about change in breast skin. Whereas in the study carried out by Haji-Mahmoodi et al., (2002) [20], only 27% knew that pain is not a cardinal feature of breast cancer. Other studies have also reported similar findings [21, 22]. These wrong informations or assumptions about breast lumps may account for some of the reasons why some of our patients present late to hospital [21, 23]. In the study on why patients with breast cancer present late for management, several studies found that majority of the patients has a wrong perception of malignant diseases of the breast, particularly the early symptoms of breast cancer [24, 25].

Regarding to associated risk factors for breast cancer, about 69.11% and 64.53% knew that smoking and a positive family history of breast cancer respectively are risk factors, while 43.59% knew that obesity also an implicated risk factor. Most of the participants in this study didn't know the association between breast cancer and short periods of breast feeding (1.83%), early menarche (11.13%) and late menopause (28.14%). Also, around 46.60%, 52.36% and 24.48% of participants realized the effect of use of contraceptive, advanced age and delivery of first child after the age 30 respectively as risk factors of breast cancer. Participants showed poor understanding of major breast cancer risk factors. The perception of the use of contraceptive by 46.6% might reflect the religious culture that encourages natural methods of birth control [26, 27].

These result were near to that reported in study done by Adebamowo and Ajayi, (2000) [21]; Odusanya, (2001) [28]; Adebamowo and Adekunle, (1999) [29], where these studies have shown that the incidence of breast cancer is said to be slightly higher in persons that have first degree relatives with a history of breast cancer, persons that have early menarche and late menopause and those that use oral contraceptives, persons do not breast feed and those women having their first birth after age 35 or nulliparous women. The incidence is also increased with increasing age of the patient, smoking, obesity, physical inactivity, radiation exposure, intake of alcohol and high fat. Thus further health education on associated risk factors and protective factors is desirable. This may influence the attitudes, practices and lifestyle of our patient positively. In a study done by Adebamowo and Adekunle, (1999) [30], it was observed that patients with positive family history tend to present early for management.

Also, one of the major factor, why we experience late presentation of breast cancer, is that most women do not carry out BSE and CBE they do not also take advantage of the screening role of mam-

mography. It is either that they have never heard of breast self-examination or they do not know how to carry it out [30, 31].

Several recent studies that examined the knowledge and attitudes toward breast cancer and breast self-examination found that with increasing age, women doubted the benefits of early screening for breast carcinomas. It was shown that awareness about breast cancer screening was higher among younger women compared to older women over 50 years [15].

The conservative nature of our society still prevents women from directly discussing sensitive issues with their healthcare providers; therefore, there is a vital need to educate female members of the society to overcome knowledge deficits. Other factors like embarrassment and fear of social implications arising from Saudi Arabia culture and absence of a national screening program are not making things any better [14].

Ever since food and drug administration (FDA) approved the use of tools for breast cancer screening, mammography has helped reducing mortality rate in USA by 35% in women aged between 50 and 69 [32]. In fact, the American Cancer Society has made it mandatory that all women over 40 be screened by mammograms. However, there are no structured national breast cancer screening programs in most of the Arab world. Specifically in Saudi Arabia, fear and misconceptions about mammograms have delayed early treatment and decreased the survival rate [33].

The importance of BSE, CBE and mammography for early detection of breast cancer was identified by 657 (85.99%), 666 (87.17%) and 476 (62.3%) respectively by the study population. However, only 37.57% identified the appropriate time for BSE. Also, only 33.64% identified the correct age for mammograph screening. The age and marital status were variable found to have a significant correlation ($P < 0.05$) with knowledge of CBE and mammography. On the other hand, the perception

of BSE was significantly associated ($P < 0.031$) with the education level.

Only 159 (20.81%), 151 (19.76%) and 99 (12.96%) of the participants practiced BSE, CBE and mammograph respectively. This was affected by variables like age and marital status ($P < 0.05$). The present results revealed that the worry about finding a lump was the most obvious reason could sing negative attitude of around 31.94% and 45.55% of women toward breast cancer screening by CBE and mammograph respectively.

Several studies on BSE have reported similar findings [31, 34]. This may be as a result of poor health education in our society. In a study done among secondary school teachers, only about 25% had adequate knowledge of breast self-examination [28]. The implication therefore is that 75% of such a group of teachers cannot impact on their students the importance of BSE. Ferlay et al., (2013) [35], also emphasized the need for adolescents to be properly taught the routine of BSE as this will greatly influence their practice as they grow older. A related study showed that some nurses do not appreciate the importance of BSE and the need for CBE [28]. The implication of all of these is that there is the need for proper orientation about breast cancer among the various caregivers which in turn is expected to boost the level of awareness in the society.

Regarding to mammograph, the study results were consistent with that reported by Okobia et al., (2006) [36]. Health education about the benefits of mammography screening should be encouraged. Association of breast cancer knowledge with age, marriage and education level variables has been identified in other studies. Data from the National American Survey on cancer risk revealed poor knowledge among the least educated women [37].

Similar findings were reported among Hispanic women (38). The 64.53% Women's limited knowledge about breast cancer had been identi-

fied elsewhere in developed and under developing countries [31, 37, 39].

Conclusion

This study demonstrates that breast cancer awareness activities and campaigns are limited in the country, therefore efforts are still needed. Adequate health education programs should be planned throughout the year and should be widely spread. The study points to the insufficient knowledge of female about breast cancer and identifies the negative influence of low knowledge on the attitude and practice of BSE, CBE and mammography. Accordingly, relevant educational programs, based on a national base, to improve the knowledge level of women regarding breast cancer are needed. There is very urgent need for regular update courses for health workers concerning breast cancer education including screening methods.

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