Original Article

Awareness, Practice of Breast Cancer and the Screening Methods Among Female Staff of Health Science Colleges of Majmaah University

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Abstract

Background and Aim: Breast Cancer is the most commonly diagnosed and the leading cause of death among women in Saudi Arabia. Population based screening ensures early detection and prevention.

Aim: Aim of this study to determine awareness and screening practices of breast cancer among female staff of Health Science Colleges of Majmaah University.

Methods: A cross-sectional study was conducted among female teaching staff of Health Science Colleges of Majmaah University. Data was collected using a validated questionnaire. A total of 108 females participated in this study.

Results: The mean age of total 108 participants is 34.2 years (SD ± 8.5), 60 (55.5%) were between 40 and 60 years of age, and 48 (44.4%) were between 20 and 40 years. Participants overall level of awareness was good. Of the total participants 63 (58.3%) of them were aware of BC risk factors, 86 (79.6%) knew signs or symptoms and 51 (47.2%) were aware of screening methods. A significant correlation was found between awareness of clinical breast examination and mammogram ($p < 0.05$). However, the practices of clinical breast examination and mammography were low (14.9 % & 7.4%). The absence of signs or symptoms was the most common reason for not practicing clinical breast examination (78.7%) and mammography (81.5%). Awareness of noninvasive cancer screening blood tests was low.

Conclusion: All the participants had good awareness of breast cancer and screening methods; however, awareness of noninvasive screening blood tests was low. The practice of screening methods could have been better.

Keywords: Breast Cancer, early detection, risk factors, screening methods, noninvasive blood test.

Introduction

Female Breast Cancer (BC) is the second most common cancer worldwide[1]. Global Cancer Observatory Saudi Arabia describes that 13.4.% of new cases and 7.8% of deaths are due to BC[2].

BC symptoms can vary from one woman to another. Many women are asymptomatic, this mandates regular BC screening methods for early detection and diagnosis. The common symptoms are lump in the breast or axilla[3]. Most significant risk factors include a strong family history of BC or gene mutations. Additionally, women who received radiation therapy before the age of 30 or were exposed to hormonal therapy have a higher risk of developing BC[3].

Many developing countries, like Saudi Arabia, are experiencing a marked increase in the prevalence of other known cancer risk factors of BC, which are lifestyle changes, including smoking, unhealthy diet, excess body weight, and physical inactivity[4].

Early detection is crucial in controlling cancer. Recent regulations of ACS 2022 (American Cancer Society) describe that either breast self-examination (BSE) or clinical breast examination (CBE), have shown no definite benefits in earlier researches to detect early BC[3]. BC screening methods would avoid late diagnosis and early deaths. Mammography is the only reliable screening method that reduces the mortality of BC[5] and CBE is considered an adjunct to mammography[6].

Females aged 45, with average risk, should get screened yearly for mammography. Nonetheless, average-risk females between the ages of 40-44 can start screening for mammograms every year. Women aged 55 and above should continue yearly mammograms till ten years. Females at average risk for BC implies there's no personal history of BC, no positive family history, no positive genetic test (such as BRCAl, BRCA 2), and no earlier exposure to radiation[3]. Risk assessment tools for higher-risk females are family history of BC in first-degree and second-degree relatives on both maternal and paternal sides of the family or detection of positive genetic mutation test mandates magnetic resonance imaging (MRI) screening, in addition to mammogram from the age of 30 years[3].

Mammography is a state-initiated screening program implemented in the year 2010 at no cost in Saudi Arabia.[7]

In addition to the standard screening methodologies, an annual noninvasive cancer screening blood test (NICSBT) is a newly established test, which is most comprehensive and accurate liquid biopsy, includes recommended oncogenetic bio-markers[8].

It is a revolutionary test, based on a simple blood draw, for the early detection of more than 30 types of cancer, including BC.

It is the first blood test to detect early-stage BC in women above the age of 40 years[8].

Literature review shows articles of knowledge of BC, screening methods in Saudi Arabia[9-11] and a study of BSE between medical and non-medical students of Majmaah[12], however, no study was found among medical professionals. So, aim of this study was to determine the awareness and screening practice among female medical

teaching and administrative staff of the College of Medicine and College of Applied Medical Sciences, Majmaah University.

Materials and Methods

Study design: This is a simple random sampling cross-sectional study.

Study area: Majmaah University College of Medicine (COM) and College of Applied Medical Sciences (CAMS).

Study population: Participants included in the study were female teaching staff, lecturers, tutors, demonstrators, administrators, and others of both Colleges, COM and CAMS.

Inclusion criteria: All the female medical teaching and administrative staff of both Colleges, COM and CAMS.

Exclusion criteria: Females undergoing treatment, previously diagnosed with cancers other than BC, and those unwilling to consent to the questionnaire were omitted.

Sampling: Considering the total female staff in both Colleges COM and CAMS, Majmaah University, to be 122, the sample size was calculated to be 93 based on a confidence level of 95% and a 50% population proportion using the Raosoft@ sample size calculator.

Data Collection

The research comprises various stages, questionnaire preparation and its verification with the standards, administration of the questionnaire and analysis of the responses. This work was done between April 2022 and February 2023. Considering the total staff at Majmaah University's Colleges COM and CAMS, 122 questionnaires were distributed in English and Arabic

Total 108 participants from both colleges submitted complete responses with a total response rate of 88.5%. The study excluded incomplete responses.

Questionnaire:

A standard English questionnaire from earlier studies was followed[13-14], questions on the newly approved NICSBT were included[8] and translated to Arabic. Validation of relevant questions through a pilot study was done. 10 samples were used for pilot study and were included in the sample study. No specific changes were made in questionnaire after pilot study. Cronbach's Alpha value of 0.865 was obtained and it's indicated that 86 % of the items in the questionnaire were legitimate.

The questionnaire included three sections: a] socio-demographic characters, b] awareness of BC risk factors (10 items), signs, and symptoms (9 items), with answer options used "Yes" and "No". Those who answered "Yes" for 5 items or more (51-100%) were considered as having good knowledge and who answered "Yes" for 0-4 items (0-49%) were considered as having poor knowledge. Awareness of methods of diagnosis of BC were six items. Participants who answered "Yes" for 3 items or more (51-100%) were known to have good knowledge c] The last section of the questionnaire consisted of awareness and practices of CBE, mammography, of which 1 item each pertaining to awareness of age at which CBE and mammography are done and 1 item in each for their practices, whereas reasons for its non-practices included 9 items each. For awareness of NICBST, there were 2 items,

its knowledge and age at which it is done, and its practice included 1 item.

Data Analysis

Questionnaire responses are summarized and analyzed using Statistical Package for Social Sciences (SPSS) version 25, the data and its measures of variability were used to describe the results. Qualitative variables were presented as frequency and percentages (n, %), mean and standard deviation; Pearson's Chi-square test of independence was used to interpret correlations between awareness of screening methods CBE and mammogram. P value less than 0.05 was expressed as statistically significant ($p < 0.05$). Spearman's rank measured the strength and direction of a monotonic association between age and variables of screening methods.

Ethical Consideration

The participants were informed about the goals of the questionnaire, and consent was taken. All the information obtained was maintained confidential. Ethical approval was taken from the Majmaah University for Research Ethics committee (MUREC) (HA-01-R-088) with ethical number MUREC- Apr.17 /CONI-2O22 /33-6.

Results

Socio-Demographic Characters

The mean age of total 108 participants is 34.2 years (SD ± 8.5), 60 (55.5%) were between 40 and 60 years of age, and 48 (44.4%) were between 20 and 40 years among which (42.6%) were between 30-39 years while (39.8%) between 40-49 years. (86.5%) are married. [Table 1] In total, (14.9%) are nulliparous. None of the participants had positive family history.

Table 1: Socio-Demographic characters and Awareness of Breast Cancer of participants

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S.No	Age Years	Total (n=108)	
	Variables	**■'(%)**	
1	20-29	2(1.8)	
2	30-39	46 (42.6)	
3	40-49	43 (39.8)	
4	50-59	14(12.9)	
5	60-69	3 (2.7)	
	Mean age	34.2 years	
	Standard deviation (SD)	(SD ± 8.5)	
	Marital Status		
1	Single	9 (8.4)	
2	Married	93 (86.5)	
3	Separated	4 (3.7)	
4	Widow	2(1.8)	
	Variables	**(n=108)**	
S.No	**Risk factors**	**Yes n (%)**	**No n (%)**
1	Increasing age	59 (54.6)	49 (45.4)
2	Positive family history	90 (83.3)	18(16.6)
3	Breastfeeding	85 (78.7)	23 (21.3)
4	Obesity	39 (36.1)	69 (63.8)
5	Oral pills	64 (59.2)	44 (40.7)
6	Not becoming pregnant at all	53 (49.1)	55 (50.9)
7	First child at a late age	25 (23.1)	83 (76.8)
8	Positive family history of Ovarian Cancer	74 (68.5)	34 (31.4)
9	History of exposure to radiation	65 (60.1)	43 (39.8)
10	Trauma or injury to the Breast	27 (24.9)	81 (74.9)
	Signs & symptoms		
1	Lump in the breast	96 (88.8)	12(11.1)
2	Discharge from the nipple	82 (75.9)	26 (24.0)
3	Pain or soreness in the breast	58 (53.7)	50 (46.3)
4	Change in the size of the breast	81 (74.9)	27 (24.9)
5	Discoloration/ dimpling of breast	82 (75.9)	26 (24.0)
6	Ulceration/ scaling of the breast	82 (75.9)	26 (24.0)
7	Retraction of nipple	67 (62.0)	41(37.9)
8	Lump in axilla	85 (78.7)	23 (21.3)
9	Weight loss	39 (39.1)	69 (63.8)

Frequency (n), percentage (%), mean, Standard deviation (SD)

Awareness of Breast Cancer

Participants awareness of risk factors, signs and symptoms of BC is shown in [Table 1] Most participants (83.3%) considered positive family history as a potentially significant risk factor for BC followed by (78.7%) breastfeeding decreases the risk of cancer. The other major risk factors were positive family history of ovarian cancer (68.5%), history of radiation exposure (60.1%), oral pills increasing the risk of cancer (59.2%) and increasing age (54.6%). Most of them were aware of all the risk factors.

The most obvious signs, lumps in breast and axilla, were acknowledged by majority of participants (88.8%) and (78.7%), respectively. Retraction of nipple (62%), Pain in breast mass (53.7%), and weight loss (39.1%) were considered lesser-known symptoms of BC. Most participants had relevant knowledge of signs and symptoms of BC.

Awareness of Breast Cancer Screening Methods

Most of the participants were aware of core diagnostic methods of BC, CBE (81.5%) and mammography (77.5%), followed by breast biopsy/FNAC (fine needle aspiration cytology) (56.5%), however genetic testing (44.5%), breast USG (ultrasound) (39.9%) and MRI (33.4%), were recorded as less-er-known screening methods [Figure 1].

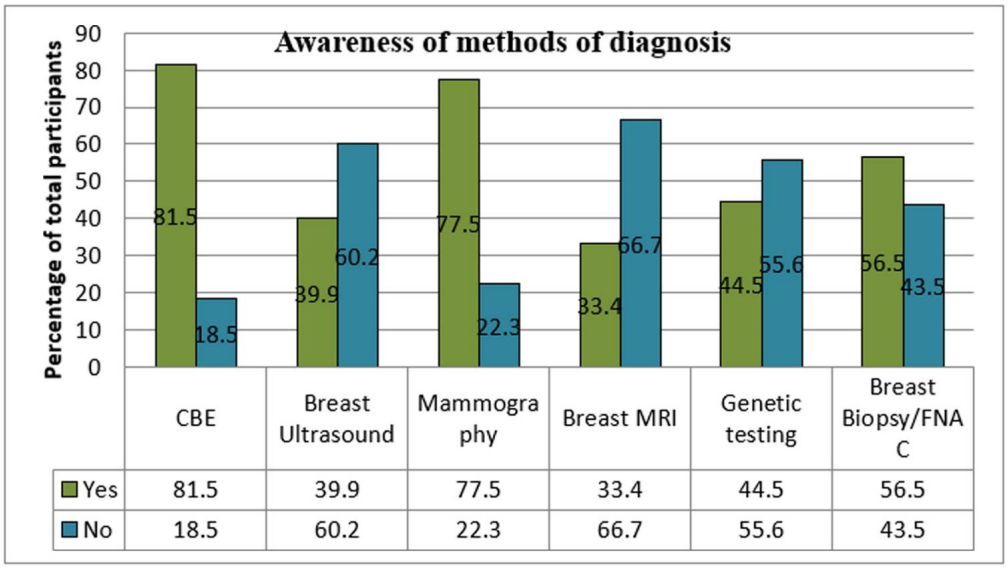


Figure 1: Different Methods of Diagnosis of Breast Cancer

Participants' overall level of awareness was good [Table 2], Of the total participants 63 (58.3%) of them were aware of BC risk factors with mean score of 5.15±2.65 (out of 10 items), 86 (79.6%) knew signs or symptoms with mean score of 6.24±2.67 (out of 9 items) and 51 (47.2%) were aware of screening methods with mean score of 3.43±1.98 (out of 6 items).

Table 2: Level of Awareness of Breast Cancer

Awareness level	BC awareness of risk factors		BC awareness of Signs & symptoms		Screening methods of diagnosis BC	
	10 (items)		9 (items)		6 (items)	
	N	%	N	%	N	%
Poor (0-4)	45	41.7	22	20.4	57	52.8
Good (5-10)	63	58.3	86	79.6	51	47.2
Mean± SD	5.15±2.65		6.24±2.67		3.43±1.98	
Good (score 51-100%); Poor (0-49%)						

Frequency (n), percentage (%), mean, Standard deviation (SD)

Awareness and Practices of CBE and Mammography

Among the total participants, (37.1%) knew the age of CBE should be 40 years. (85.2%) of the participants had not undergone CBE. (38.9%) correctly said the age of mammography screening is 40 years, followed by (24.8%) said 45 years. (19.4%) were unaware of mammography; thus, the statistical score for awareness of screening is significant (X2 = 52.08, P <0.0001) 2 [Table 3],

The majority of the participants (92.6%) have not undertaken mammography. Awareness and practice of screening methods were found to be low.

Table 3: Awareness and Practices of CBE and Mammography

Variables		CBE n=108(%)	Mammography n=108(%)	X^2 P value
Screening is done at age.	Age in years			
	30	33 (30.5)	11 (10.1)	**52.08**
	35	28 (25.9)	8 (7.4)	
	40	40 (37.1)	42 (38.9)	**<.00001***
	45	5 (4.6)	26 (24.8)	
	Don't know	2(1.8)	21 (19.4)	
Have you ever done a Screening	Yes	16(14.9)	8 (7.4)	3
	No	92 (85.2)	100(92.6)	0.08
*P value: significant				

Frequency (n), percentage (%)

Reasons for Not Practicing Screening:

CBE *&c* Mammography

No signs and symptoms were most common reason for not practicing CBE (78.7%) and mammography (81.5%). The other reasons for non-practices for both CBE and mammography were fear of outcome (16.7%), (3.7%), preferring female health care assistant (12.03%), (3.7%), and no doctor recommended (11.1%), (8.3%) respectively. [Figure 2].

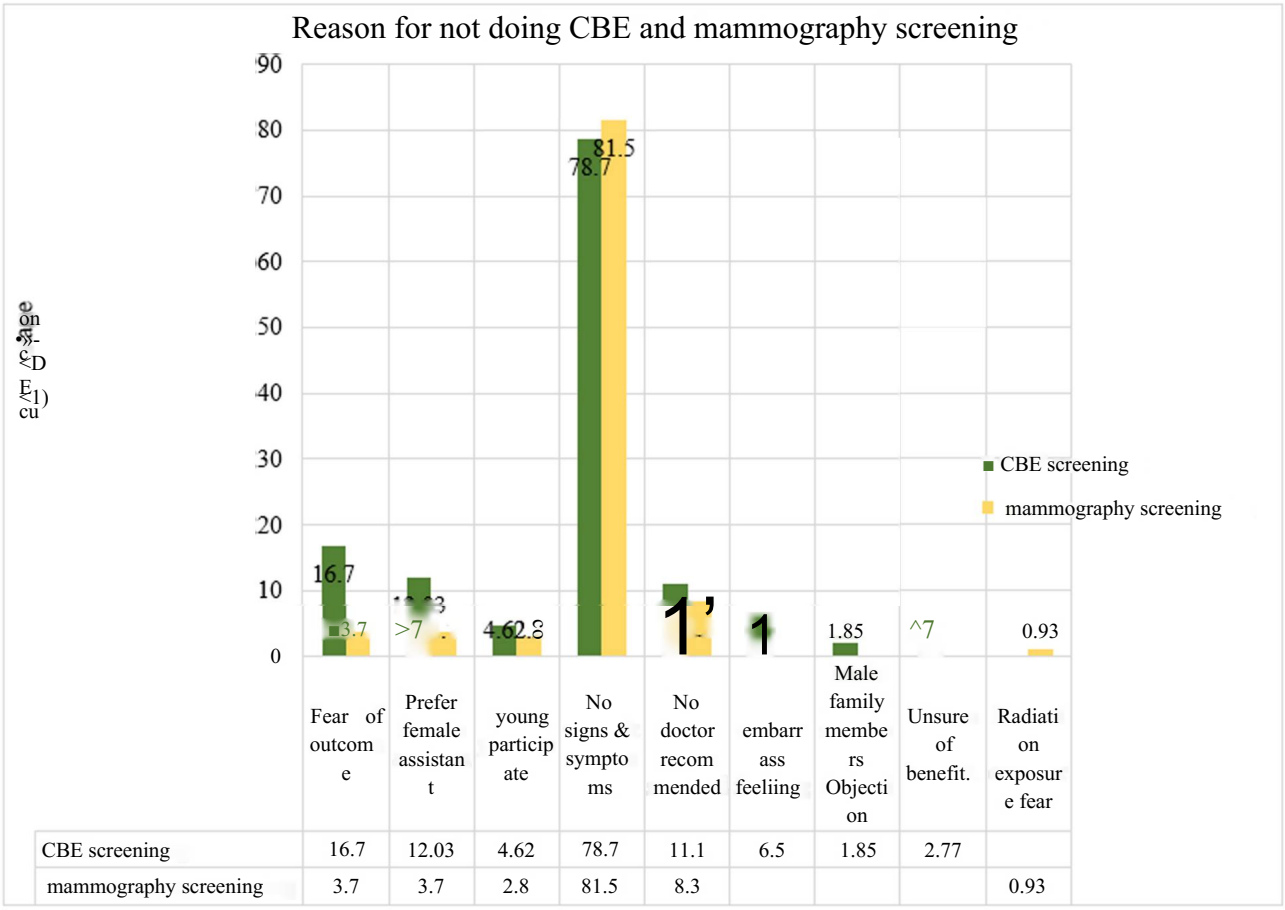


Figure 2: Reason for not doing CBE and mammography screening

Awareness & Practices of future Screening methods of Breast Cancer: NICSBT for early detection

Out of the total participants only (28.6%) of medical teaching staff were aware of recent NICSBT that can detect early-stage asymptomatic BC and (71.4%) were not aware of the same. Very few (10.2%) knew the age at which test was done; the rest (89.8%) did not know.

Majority of them were neither aware of NICSBT nor do they know recommended age. None of the total participants (100%) had ever undertaken this test.

Spearman's Association Between age; Awareness & Practices of Screening

Spearman's rank measured the strength and direction of a monotonic association between age and awareness, practices of mammography and NICSBT. Negative correlation was observed between age and awareness of screening methods and its practices, whereas positive correlation was observed between awareness, practices of mammography and NICSBT, however p value to 0, weaker is the association between the awareness, practices of NICSBT (p=Spearman Coefficient) **[Table 4].**

Table 4: Spearman's Association Between age; Awareness & Practices of Screening

		Age	Awareness of age of mammography screening	Practice of mammography screening	Awareness of NICSBT	Awareness of age at which NICSBT to be done
Awareness of age of mammography screening	r	-.201*				
	p	0.04				
Practice of mammography screening	r	-.193'	.236*			
	p	0.05	0.014			
Awareness of NICSBT	r	-.23	.295"	.207*		
	p	0.02	0.002	0.032		
Awareness of age at which NICSBT to be done	r		.258"	.253**	.641**	
	p		0.007	0.008	0.000	
Practice of NICSBT*	r	-.29'*	.207*	.274"	.440*'	.374'*
	p	.002	0.032	0.004	0.000	0.000

Noninvasive Cancer Screening blood test [NICSBT];

r =Spearman's rank correlation, p =Spearman Coefficient **Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Discussion

Our study aimed to determine awareness, screening practices and recently introduced NICSBT among university medical professionals and other staff. Most participants had good awareness of BC risk factors, signs and symptoms, CBE, mammography screening, however their practices were found to be poor. Medical professionals' awareness and practices of NICSBT were very low.

Of the participants (83.3%) considered positive family history a potentially significant risk factor. A higher percentage (97.6%) was recorded by Ayoub et al. on community pharmacists[14]. Lower findings were noted by Kotepui et al, and other Nigeria studies (51.8%)[15,17].

In our study (59.2%) considered oral contraceptive pills (OCPs) a risk factor for BC. Similar finding (58.1%) seen in Thailand study[15], in contrast higher and low value were recorded in Nigerian and Cameroon studies respectively[16,18].

Obesity, risk factor for BC was recognized by (36.1%) in our study while higher findings recorded by Ayoub et al[14] and in this study first child at a late age showed lower percentages consistent with Nigeria studies[16,17].

Most recognized symptom lump in the breast (88.8%) in our study, followed by (75.9%) discharge from the nipple. Our findings were consistent with other studies[14,15,18]. In our study, pain in breast mass is the lowest recorded symptom (53.7%). This finding is in accordance with a study published in guidelines on diagnosing and treating BC[19]. Painful mass is an atypical finding in BC; was stated by (46.7%) of pharmacists 14. Pain recorded lower values in Cameroon study[18].

The majority of participants (81.5%) recognized CBE. [Figure 2] similar findings found in KFMC Riyadh[20], while low rates of recognition seen in several studies[13-14,21,22]. Our CBE practices were low (14.9%) [Table 3] and other studies too had lower practice rates (16.5%) and (9.0%)[14,21]. The absence of signs and symptoms (78.7%) was the main reason for the non-practice of CBE in our study. This is consistent with other studies which reported no symptoms, no doctor recommended and fear of outcome.[14,20]

Most of the participants in our study (77.5%) recognized mammography screening. [Figure 2] However, (38.9%) knew starting age at 40 years, but level of practice was low (7.4%). Higher awareness of mammography and its start age, but with poor practices were recorded in several studies[13-14,20,22]. In contrast mammography high practice rates were seen in health workers of Cameroon above 45 years (22.5%)[23], and the reason being presence of symptoms and recommendations from health professionals.

In this study, most common reason for not having mammogram is the absence of symptoms (81.6%). In other studies, KFMC Riyadh (24.0%) felt no reason to undergo mammography, and (33.2%) said they were not old enough[20]. The main reason for pharmacists (48.7%) is their age was inappropriate for mammograms[14].

We found that routine annual mammograms were not commonly conducted among the participants in our study. This was not expected as 60 (55.5%) were between 40 and 60 years of age, and 48 (44.4%) were between 20 and 40 years. Overall, the practice rate for mammograms in the majority of the studies was found to be poor. This could be because, compared to our research, most of the participants in other studies were under 40. Several studies showed that the reason for not undertaking mammograms was participants belonged to younger ages [13,14>22>24].

Most of the studies noted that doctors have better awareness than nurses, pharmacists, and other allied health professionals [9,13,17,22,25,26].

Our study and several other studies found that awareness regarding mammography was higher[22,25,27] while practices were low [14,20,22,27].

However, this study is better than previous studies conducted in many other areas of K.S.A, which showed low awareness and low practices.[28-30]

In our study, only a small percentage (10.2%) of medical teaching staff were aware of NICSBT. Few articles have been published about knowledge, awareness, and screening practices for newly introduced NICSBT [8,31,34]. The scarcity and lack of information on related articles limit our ability to make comparisons. There is need for more studies and orientation of new tests for early detection of BC among the general population.

All the participants had good awareness of BC and screening methods; however, awareness of noninvasive screening blood tests was low. The practice of screening methods could have been better.

Conflict of Interest: No conflict of Interest.

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