

# Breast Cancer Knowledge and Screening Practice among Women in Makkah, Saudi Arabia

Arwa F Flemban<sup>1</sup>, Saeed M Kabrah<sup>2</sup>, Suhail S Alfaifi<sup>3</sup>, Ahmed S Alsubhi<sup>3</sup>, Ayoub S Alzahrani<sup>3</sup>, Khalid A Alhazmi<sup>3</sup>, Samah Alharbi<sup>4\*</sup>

<sup>1</sup>Pathology Department, Faculty of Medicine, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.

<sup>2</sup>Laboratory Medicine Department, Faculty of Applied Medical Sciences, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.

<sup>3</sup>Faculty of Medicine, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.

<sup>4</sup>Physiology Department, Faculty of Medicine, Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia.

\*Correspondence to: Samah Alharbi (E-mail: saaharbi@uqu.edu.sa)

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## Abstract

**Objectives:** This study aimed to estimate the level of current knowledge regarding breast cancer in Saudi Arabia. We assessed the knowledge of breast cancer risks, the knowledge regarding the BSE and mammogram in Saudi Arabian females using a survey-based study.

**Methods:** A cross-sectional study was conducted using a self-administered survey to assess the knowledge and practice of Saudi women toward Breast cancer examination. Collected data were analyzed using SPSS program.

**Results:** A total number of 499 surveys were collected. The data showed that there was general lack of practice of BSE in the sample only 186 (37%) reported that they practiced regular BSE and only 16 (3%) reported that they went to the clinic for breast examination. Among all participants around 54% had poor overall knowledge of breast cancer 65% had poor knowledge regarding breast cancer risk and 93% had poor knowledge regarding clinical examination. Surprisingly, 56% had good knowledge regarding the clinical picture of breast cancer.

**Conclusion:** This clearly showed that the lack of breast self-examination, mammogram and clinical examination is not a result of total lack of knowledge but due to lack of knowledge regarding risks and examination. This set of data provide a guideline for the focus and planning of future breast cancer awareness campaigns.

**Keywords:** Breast cancer, mass screening, awareness

## Introduction

Worldwide, breast cancer is the most common type of cancer among women.<sup>1</sup> It is ranked as the first cause of death, in the case of women, compared with other types of cancer, constituting 15% of cancer death.<sup>2-4</sup> Breast cancer incidence rates are increasing globally especially in developing countries, this may be due to lower screening rates and incomplete reporting.<sup>2</sup> In Saudi Arabia, breast cancer considered as a major source of death in females.<sup>5</sup> According to ministry of health in Saudi Arabia, more cases are detected at late stage compared to developed countries, 50% and 20% respectively, causing higher mortality rate, lower prognosis rate, and higher cost for treatment.<sup>6</sup> Regretfully, according to the latest statistics in Saudi Arabia 15.5% of newly diagnosed breast cancer cases have distant metastasis and 40% of cases are diagnosed with regional spread at diagnosis.<sup>6</sup> This figure illustrates that there remains lack of awareness regarding breast cancer that resulted in the delay in early detection. The 40% of patients with regional spread would have been detected earlier if there was a success in recognizing the early signs by breast self-examination (BSE). Additionally, the 15.5% of patients with distance metastasis would have benefited from treatment by earlier detection through BSE and mammogram.

The chance of developing a disease increases as the risk factors increase, and breast cancer isn't an exception. Risk factors for breast cancer include age, as the disease peaks around age 60 with a sharp incline beginning at age 40.<sup>7,8</sup> In fact, One of the most recognized risk factors for breast cancer is the duration of exposure to the hormones that regulate the female menstrual cycle including estrogen (ER) and progesterone (PR). Thus, there is no surprise that early menarche and late

menopause is one of the most important risk factors.<sup>9</sup> Also, race is considered as a risk factor, and it is found that there is lower risk in black women.<sup>10</sup> Another important risk factor if the family history and previous history of the breast cancer and any other cancer.<sup>7</sup> Also, prolonged use of hormonal contraceptive is of the known risk factors as well as menopausal hormone therapy.<sup>9</sup> Other risks include; delayed childbearing, decreased duration of breastfeeding, smoking, alcohol consumption, and sedentary lifestyle.<sup>11</sup>

Early detection of breast cancer by screening tests leads to more success in treatment and therefore better prognosis.<sup>12</sup> Commonly used screening methods for breast cancer include mammography, CBE (clinical breast examination), and BSE (breast self-examination). Performing mammography by skilled technologists and interpretation by experienced radiologists can result in 85% to 90% accuracy rate in identifying pre-clinical, non-palpable tumors <15 mm in size.<sup>13</sup> This leads to reduction of mortality by 30% to 50%.<sup>14</sup> ACOG (American College of Obstetricians and Gynecologists) recommendations for average-risk women state that mammography should be offered at the age of 40, and to be started no later than the age of 50 annually or biennially. CBE may be offered every 1–3 years for women at the age of 29–39, and annually for women at the age of 40 and above.<sup>15</sup> Regardless the low cost of CBE and BSE screening tests, the supporting evidence of their effectiveness on reducing mortality is still lacking.<sup>16</sup>

Early detection of breast cancer would be enhanced if women in Saudi Arabia had better knowledge about breast cancer and were aware of the importance of practicing the recommended tests. Thus, this study aims to determine the level of basic knowledge regarding breast cancer risk factors and its

clinical picture, to determine prevalence of breast cancer screening tests practice among women in Makkah, Saudi Arabia, and to determine the relationship between the mammogram practice and the knowledge of breast cancer risk factors and clinical picture.

## Methodology

### Study Design and Study Population

A cross-sectional survey-based study was conducted to assess the breast cancer related knowledge, attitudes and practice among females in Saudi Arabia.

### Data Collection

The research goals were used to create a questionnaire. It asked for personal information as well as a history of linked health incidents. The survey also looked at women's knowledge and attitudes about breast cancer, as well as their use of screening techniques. During the academic phase, data was collected by pre-trained microbiology students as part of their research projects.

After a thorough examination of the literature, the questionnaire was created based on prior research. A group of professionals in research technique validated the face validity of the questionnaire before it was administered to the study population. The reliability was assessed using Cronbach's alpha, which was determined to be >0.70. The questionnaire was accompanied by a survey cover page that explained the research and was signed and completed by the participants. To safeguard participants' identities and preserve data confidentiality, complete anonymity was maintained.

The numerous survey questions were designed after an exhaustive literature search, and the questionnaire was separated into many parts. Some of the questions were changed or removed based on the expert committee's suggestions since they were either off-topic or inappropriate for the Saudi community. The questionnaire was divided into many sections.

The first section elicited socio-demographic information about each study participant's family income, education, marital status, history of breast cancer, and family history of breast cancer.

In the second section, there were questions on breast cancer knowledge. These questions were divided into three categories: possible risk factors, signs and symptoms, and methods of breast cancer screening and diagnosis, such as BSE and mammography. The respondents were requested to record their answers by choosing one of the three options: 'Yes', 'No', or 'Don't Know'. The scale was then dichotomized (Yes = 1 and No/Don't Know = 0).

### Data Cleaning

SPSS (Version 28) was used for initial data cleaning, variable coding, variable computation, assumption checking and analyses. Descriptive analyses identified any potential outliers, out of range values and missing data values. No out of range values were detected.

### Data Analysis

Descriptive statistics were used to summarise the demographic and clinical characteristics of the participants. The descriptive

statistics involved frequency and percentage analyses of categorical variables.

### Validity of the Questionnaire

Validity represents the degree to which any measuring instrument measures what it is proposed to measure.<sup>7</sup> There are many aspects and methods for evaluating the questionnaire validity:

1. **External (Content) Validity:** Content validity refers to the degree to which the questionnaire delivers adequate coverage of the research questions.<sup>17</sup> The content validity of the questionnaire is conducted through the supervisor review in order to assure that the content of the questionnaire is consistent with the research objectives, and evaluate whether the items reflect the research problem or not. Also, academicians from the ..... University reviewed the questionnaire and provided valuable notes to improve its validity that their comments are taken into consideration.
2. **Internal Validity:** Internal validity of the questionnaire is measured by the correlation coefficients between each item in one field and the whole field.<sup>7</sup>

## Results

### Reliability and Internal Consistency of the Questionnaire

Cronbach's alpha was used to test for reliability and internal consistency of the questionnaire. As shown in Table 1, the two-section scale showed good to excellent reliability, as did the overall scale.

### Participants Characteristics

A total of 499 Wemen participated in the current study and most of them were Saudi (85%). The sample was of high variability to insure including all the possible layers of society and that included different educational levels, family income, marital status, age groups, and region. Results (Table 1) indicated that the majority of the participants were married (49.3%), whereas 41.9% were single and only 8.8% were divorced or widowed. The mean age of the participants were  $38.76 \pm 12.71$  years, nearly half of the respondents were below the age of 40. The study sample reflected a high educational level in which 69.5% of the participants held a bachelor's degree. Only nine women (15.8%) reported a having a family member who was previously diagnosed with breast cancer. When asked about the source of their knowledge regarding breast cancer, it was found that the main source was internet/social media (54.7%). The frequency and percentage of participant demographic information are displayed in Table 2.

Table 1. Reliability analyses for patient-centred communication scale

Scale	Number of items	Cronbach's alpha
Breast cancer knowledge	22	0.848
Screening test practice and knowledge	14	0.615
Total	36	0.758

Table 2. Frequency and percentage for participant characteristics (n = 499)

Characteristic		n	%
Nationality	Saudi	424	85.0
	Non-Saudi	75	15.0
Age group	<40	243	48.7%
	40–50	165	33.1%
	>50	91	18.2%
Region	Middle region	138	27.7
	Western region	149	29.9
	Eastern region	66	13.2
	Southern region	98	19.6
	Northern region	48	9.6
Marital status	Single	209	41.9
	Married	246	49.3
	Divorced or widow	44	8.8
Educational level	Undergraduate	105	21.0
	Bachelor	347	69.5
	Post-graduate	47	9.4
Total family income per month (Saudi Riyale)	<5,000	138	27.7
	5,000–9,999	159	31.9
	10,000–15,000	111	22.2
	>15,000	91	18.2
First degree relative diagnosed with breast cancer	Yes	79	15.8
	No	420	84.2
Breast cancer information source	Reading	70	14.0
	Lectures and seminars	67	13.4
	Family and friends	46	9.2
	Internet/social media	273	54.7
	Your doctor	7	1.4
	TV	36	7.2

### Participant's Level of Knowledge Regarding Breast Cancer

Next the correct answers were analysed and presented in Table 3. The questions were categorised into three main sub-headings: knowledge regarding breast cancer risks, the clinical picture of breast cancer and the knowledge regarding the clinical breast examination (CBE). As seen in Table 3A, there were fair to poor overall knowledge regarding breast cancer. When subdivided into categories it is clearly seen that the knowledge regarding the clinical picture of breast cancer was higher from fair to good. On the other hand, there were poor knowledge regarding the risk factors and knowledge regarding the CBE. The highest recognised risk factor was the lack of physical exercise (sedentary lifestyle) (77%) followed by smoking (65.5%), oral contraceptives (60%), age (57%) and hormone

Table 3A. Participant's level of knowledge about breast cancer (n = 499)

The question field		n	%
Breast cancer overall knowledge	Poor	268	53.7
	Fair	205	41.1
	Good	26	5.2
Breast cancer risk knowledge	Poor	322	64.5
	Fair	144	28.9
	Good	33	6.6
Breast cancer clinical picture knowledge	Poor	63	12.6
	Fair	158	31.7
	Good	278	55.7
Breast cancer clinical examination knowledge	Poor	464	93.0
	Fair	33	6.6
	Good	2	0.4

Table 3B. Participants knowledge frequency and percentage for breast cancer (n = 499)

The question field	Correct answers	
	n	%
Risk factors knowledge		
Early menarche (less than 12 years)	48	9.7
Late menopause (55 years and older)	94	18.8
No children	136	27.3
First child after 30 years	241	48.3
Breastfeeding total duration (2 years and more)	147	29.5
Obesity	236	47.3
Cigarette/Shisha smoking	327	65.5
Increase age (more than 40 years)	287	57.5
Sedentary lifestyle (no physical activity)	384	77.0
Oral contraceptives	303	60.7
Antibiotics	161	32.3
High dose of vitamins	123	24.6
Hormonal replacement therapy after menopause	273	54.7
Calcium therapy	31	6.2
Vitamin D after menopause	277	55.5
Clinical picture knowledge		
Breast mass	469	94.0
Nipple discharge	390	78.2
Nipple ulcer	354	70.9
Changes in breast skin color	384	77.0
Breast pain	66	13.2
Clinical examination knowledge		
Best examination time	202	40.5
Best age for mammography	31	6.2
Interval of mammography	31	6.2

replacement therapy (54%). The most known warning sign was detecting a breast mass, as reported by 94% of participants, as shown in Table 3. The only fair knowledge regarding CBE among the participants was regarding the best time for clinical examinations (40% correct answers). Only 6% of participants in the study know about the recommended age for mammography.

### Participants Attitude toward Self-Examination and Clinical Examination

There were poor practise of BSE and CBE in the participants. Only 37% reported that they practised BSE regularly and only 3% reported that they visited clinician regularly to do clinical breast examination (CBE), Table 4.

### Analysis for the Association of Knowledge and Practice of Self-Examination and Clinical Examination of the Breast

As seen in Table 5a, poor overall knowledge (knowledge about risk factors, clinical picture, and CBE) was associated

significantly ( $P < 0.001$ ) with no practice of BSE and that the maximum of those preformed regular BSE had fair knowledge regarding breast cancer. Next, we subdivided the knowledge into three categories (risk, clinical picture and CBE) and assessed for association between knowledge regarding these categories and BSE practice. Poor knowledge regarding the risk factors for breast cancer was significantly associated with lack of BSE practice ( $P < 0.001$ ). There were fair to good

Table 4. Participants breast self-examination and mammography practise (n = 499)

Attitude toward	Practice	n	%
Regular breast self-examination (BSE)	Yes	186	37.3
	No	308	61.7
Regular clinical breast examination (CBE)	Yes	16	3.2
	No	483	96.8

Table 5. Level of knowledge of breast cancer among Saudi women association with their practice of screening via (a) self-examination (b) mammography (n = 499)

Breast cancer knowledge type	Knowledge level	(a) Self-examination (BSE)		Chi-square	P-value
		Yes No. (%)	No No. (%)		
Overall	Poor	66 (13.2)	202 (40.5)	45.2	<0.001*
	Fair	101 (20.2)	104 (20.8)		
	Good	19 (3.8)	7 (1.4)		
Risk	Poor	93 (18.6)	229 (45.9)	29.5	<0.001*
	Fair	72 (14.4)	72 (14.4)		
	Good	21 (4.2)	12 (2.4)		
Clinical picture	Poor	18 (3.6)	45 (9.0)	13.0	0.001*
	Fair	45 (9.0)	113 (22.6)		
	Good	123 (24.6)	155 (31.1)		
CBE	Poor	168 (33.7)	296 (59.3)	3.2	0.199
	Fair	17 (3.4)	16 (3.2)		
	Good	1 (0.2)	1 (0.2)		
Breast cancer knowledge type	Knowledge level	(b) Mammography		Chi-square	P-value
		Yes No. (%)	No No. (%)		
Overall	Poor	30 (6.0)	238 (47.7)	0.408	0.816
	Fair	24 (4.8)	181 (36.3)		
	Good	4 (0.8)	22 (4.4)		
Risk	Poor	40 (8.0)	282 (56.5)	0.715	0.700
	Fair	14 (2.8)	130 (26.1)		
	Good	4 (0.8)	29 (5.8)		
Clinical picture	Poor	4 (0.8)	59 (11.8)	1.970	0.373
	Fair	20 (4.0)	138 (27.7)		
	Good	34 (6.8)	244 (48.9)		
Practice	Poor	46 (9.2)	418 (83.8)	19.3	<0.001
	Fair	11 (2.2)	22 (4.4)		
	Good	1 (0.2)	1 (0.2)		

knowledge regarding the clinical picture of breast cancer and was associated with increased practice of BSE ( $P = 0.001$ ).

There were poor CBE among the participants in this study. The only association with CBE was seen between poor knowledge regarding the CBE and the practice of CBE ( $P < 0.001$ ).

## Discussion

Early identification and treatment of breast cancer rely heavily on knowledge and awareness. Clear and correct knowledge of breast cancer risks, diagnosis, breast self-examination (BSE), clinical breast examination (CBE) and clinical picture are important for all females. Detailed information regarding these factors forms the focus of the awareness campaigns. As a result, this research was carried out to assess the knowledge, attitudes, and behaviours of breast cancer screening among Saudi Arabian women. Our population had very low understanding of risk factors, and diagnostic procedures (CBE). Our cohort's knowledge of breast cancer seems to be lower than that seen in several previous research, however, we assessed for the reliability of the survey and the population and as seen in table 1 the reliability score was high (Alshahrani et al; 2019, Jahan et al; 2007).<sup>18</sup>

Several studies are available in Saudi Arabia that are aimed to assess the knowledge of females regarding breast cancer.<sup>10,19-22</sup> The major conclusion of these studies is that there is general lack of knowledge in females in Saudi Arabia. These studies had concluded that the lack of knowledge is reflected in low early detection in the country and that improving knowledge via breast cancer awareness programs will aid in decreasing late diagnosis and thus, improving the chances of treatment and improve prognosis of the disease. Here, we assessed and analyze specifically the relationship between knowledge of (risk factors, clinical picture, BSE and CBE) and the attitude toward the practice of BSE and CBE. This type of analysis allowed the stratification of the possible cause of lack of practice and provide an insight into the areas that require further improvement in future awareness campaigns.

A poor to fair knowledge about breast cancer was seen in all the participants of this study 263 (53.7%). The practice of BSE and CBE is very poor in the participants as well. This gave us an opportunity to assess for the exact area of knowledge that is associated with the lack of practice. A. Alam (2006) concluded that there is lack of knowledge regarding breast cancer self-examination and that there is moderate knowledge regarding breast cancer risks.<sup>23</sup> Here, we found that the lack of BSE was due to lack of knowledge regarding the risks of breast cancer including the risk age, factors that increase the risk of breast cancer including obesity and hormonal therapy and oral contraceptives.

Another aspect that is highlighted here is the assessment of the sources of information regarding breast cancer in the participating female. Previously, a study in King Saud University concluded that mass media is an important source of

information to improve the breast cancer awareness regarding self-examination.<sup>7,8</sup> In agreement, we found that the major source of information for the ladies in this study was the internet and social media (54.7%) followed by reading (14%), lectures and seminars (13.4%). The top two sources of information regarding breast cancer can lack validity. The most important source of information and probably the most accurate is from the physicians and surprisingly we found that this is the lowest source of information considered in our study population (1.4% only). Thus, efforts to educate the public regarding the most appropriate sources of information is necessary. Also, more effort is needed from all responsible authorities to enrich the public media including social media, internet websites and other easily accessible portals with the correct knowledge. The information provided through these means should be planned according to studies such as this one.

A recent study has shown that although there is good knowledge regarding breast self-examination, the practice of it remains poor.<sup>24</sup> Two recent studies have contributed the lack of practice to lack of knowledge in sup-population of females depending on the level of education (Suleiman 2014)<sup>24</sup> and to the lack of sources in Arabic language.<sup>25</sup> This is in agreement with our study, as we found that there is good knowledge regarding the clinical presentation of the disease. We concluded here that the lack of practice is attributed to lack of knowledge regarding risk factors and lack of knowledge regarding the details of clinical examination including the location, proffered time and intervals between examinations. Altogether, most studies agree on the importance of continuing raising the population awareness regarding breast cancer, its risks, BSE, and mammography practice.

## Conclusion

Overall, Saudi women's knowledge, attitudes, and behaviours about breast cancer were found to be lower than predicted. Although screening techniques and resources are readily accessible and free in Saudi Arabia, robust teaching initiatives and campaigns aimed at the female population are lacking.

We can conclude that these are all evidence of the importance of planning carefully for the awareness campaigns and to include the recommendations from all these studies in the plan and execution of such campaigns. Using the data analyzed here, it can be suggested to plan for the awareness campaigns and to include the details that needs improvement in the public knowledge. Also, to use the most accessible and usable sources of information for the dissemination of such important details. Guided campaigns based of evidence from research such are this one is the next step to improve breast cancer situation in Saudi Arabia.

## Conflict of Interest

None. ■

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