



## Knowledge and Practices towards Breast Cancer Screening Tools

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### ABSTRACT

**Background:** Breast cancer screening programs may lead to a reduction of the cancer mortality rates among women. In this study, knowledge, and attitude towards mammography and Ultrasound (U/S) were evaluated among females living in the Taif region, Saudi Arabia. This examination was carried out using a well-structured electronic questionnaire from April to August 2020. A total number of 218 female applicants, aged in the range from 18 to 65 years old, participated in this investigation. **Results:** The obtained data led to the following conclusions 183 (83.95%) applicants had appropriate knowledge about mammography and U/S breast cancer screening tools and 86 (40.3%) advanced their knowledge levels through the use of social media. There was a significant correlation between good knowledge and the educational level of the participants ( $p=0.003$ ). Regarding attitude and practices, 73.39% of the respondents have not had mammography or U/S experiences. Despite their good knowledge level, they justified their lack of experience through the following reasons: 59.5% did not have lump or pain, 14.19% were afraid of the results, and 11.49% were ashamed or afraid to perform it. **Conclusion:** This study implied insufficient attitude of women about mammography and ultrasound. Accordingly, relevant educational programs are required to improve the practices of women towards breast cancer.

**Keywords:** Knowledge, Attitude, Mammography, Ultrasound, Screening, Female

### INTRODUCTION

Breast cancer has been identified as the second most prevalent cancer type around the world. This malady causes the most frequent malignant neoplasm occurring in women [1-3].

Postmenopausal women are more prone to breast cancer compared with premenopausal. This could have resulted from the cohort effect. Therefore, an increment of breast cancer incidence is expected shortly, mainly in women above 50 years. So, numerous countries have started several projects such as public awareness, along with educational and screening programs to raise women's consciousness. Nevertheless, such procedures have not yet been performed in Saudi Arabia [4].

Despite the scientific progress in medicine, breast cancer is communally diagnosed in the advanced stages, in countries with limited resources. This could be attributed to the non-efficient promotion of early detection, diagnosis, and treatment of breast cancer. Primary screening detects results in a reduction of the mortality rate in women with the age range of 50 to 74 years. Notably, less dramatic results have been reported in ages between 40 to 49 years. Therefore, large-scale mammography in the specified age groups could lead to a reduction of the mortality rate caused by breast cancer [5].

The major etiology of breast cancers has not been identified carefully. In other words, only 25% to 40% of the cases can be linked with well-known risk factors. The breast cancer risk factors vary concerning geographic features, as well as lifestyle habits of a community [6].

Generally, breast cancer is a progressive disease so early detection of the tumors enhances the chance of having a better prognosis and more successful treatment [7].

Asia and Africa have experienced very rapid growth in the annual incidence rate of breast cancer compared with the North America and Europe regions [8].

To approach a successful fight against breast cancer, the behavior of both women and health professionals must be changed. The health experts mainly contain individuals who aim to improve the knowledge, attitude, and practice of women about screening mammography [9].

Currently, the survival rate is on the order of 73% and 57%, respectively, in developed and developing countries [10].

In Developing Countries (DCs), mammograms are not carried out in primary stages. This might be linked with the existence of several barriers in the healthcare system, including limited access to health care services, unsatisfactory medical adherence associated with public healthcare system limitations, high cost of tests, and difficulty in implementation of follow-up trials [11,12].

Breast self-examination, clinical breast examination, and mammography are the most commonly known and used breast cancer screening methods in the world [13]. Mammography has been widely reported as the most versatile resource for the reduction of the mortality rate, especially in women aged between 50 to 69 years old [14-16].

In developing countries (e.g., Iran), most breast cancer cases are diagnosed in advanced stages. This corresponds to the low awareness level of most women regarding early warning signs, as well as screening methods. Also, the poor prognosis of the patients is considered as another negative factor affecting this critical issue [17].

The poor knowledge and wrong beliefs about the prevention of breast cancer have been assumed to be responsible for negative curability perceptions of early detected cancer cases [18]. Also, the efficacy of the screening tests is not well understood by most women [19].

Hence, adequate knowledge and attitude about mammography are required, in various communities, for early diagnosis of breast cancer. Herein, the awareness level of women towards mammography was evaluated in Saudi Arabia, Taif city to identify potential barriers related to breast screening.

## MATERIALS AND METHODS

### Study Design

This was a cross-sectional electronic questionnaire-based study distributed through social media, to assess knowledge and practices towards breast cancer screening tools among females who had mammography and/or ultrasound scan previously in Taif city, in the duration from April to August 2020.

### Ethical Approval

Two hundred and eighteen female participated voluntarily in this study; a well-structured online questionnaire using Google forms were shared with groups of females at Taif city. All participated women aged 18 years old or above. Any female was involved and considered to agree to the study after completing the questionnaire and resend it again.

### Data Collection

Data were collected from April to August 2020. In this step, the applicants were first trained by expert investigators to fill up the well-structured questionnaires, accurately. Then, the prepared forms were distributed between the respondents.

### Questionnaire Structure

The questionnaire framework was designed based on three main parts. Socio-demographic characteristics were placed in the first part. This section includes information about the applicants including gender, age, nationality, occupation, marital status, academic level, and the first pregnancy age. In the second phase, 6 questions were asked from the respondents to estimate their knowledge levels regarding mammography and ultrasound as breast cancer screening tools. In the last section, 8 questions were provided to evaluate the attitude of the applicants about mammography and ultrasound as screening equipment for breast cancer.

### Data Analysis

SPSS statistical software (version 21.0) was utilized to evaluate the obtained data. A Chi-square test was used to examine the associations between categorical study and outcome variables. In the statistical analysis, a p-value greater than 0.005 resulted in a significant correlation between the obtained results.

Ethical considerations: All females in this study participated voluntarily.

## RESULTS

A total number of 218 responses were obtained through distributed electronic questionnaires among female applicants living in the Taif region, in the period from April to August 2020. The respondents aged in the range from 18 to 65 years old. Socio-demographic information is provided in Table 1. Based on the obtained data, the majority of participants (44%) were in the age range of 36 to 45 years old. Also, 140 applicants (64.22%) were originally from Saudi Arabia. Moreover, 105 (48.16%) and 79 (36.24%) respondents were, respectively, housewives and employees. Furthermore, 200 (91.74%) women had higher degree educational levels and 155 (71.1%) were married.

**Table 1 Demographic characteristics of the participants (n=128)**

Age range (year)	Frequency	Percentage (%)
18-25	44	20
26-35	38	17.43
36-45	95	43.58
46-55	39	17.89
55	2	0.92
Nationality	Frequency	Percentage (%)
Saudi	140	64.22
Non-Saudi	78	35.78
Occupation	Frequency	Percentage (%)
Employee	79	36.24
House Wife	105	48.16
Students	34	15.6
Educational level	Frequency	Percentage (%)
Higher-level	200	91.74
Secondary school	16	7.34
Uneducated	2	0.92
Marital status	Frequency	Percentage (%)
Divorced	14	6.42
Married	155	71.1
Non-married	49	22.48

Results regarding the knowledge, attitude, and practice of the applicants are summarized in Table 2 and Table 3. Based on the performed analysis, 183 (83.95%) women had proper knowledge about mammography and ultrasound (U/S) as breast cancer diagnostic tools. Among these applicants, 86 (40.3%) obtained their knowledge through social media. Whilst, 59 (27.7%) and 51 (24.88%) people approached it via television and breast cancer awareness campaigns, respectively. The remaining ones (7.05%) also gained this knowledge from their families and friends. 95 (43.32%) applicants think that late marriage ages enhance breast cancer probability.

111 (50.92%) respondents agreed that both female and male groups must do breast screening imaging. Also, 138 (63.3%) women knew the importance of mammography or U/S performing for females above 40 years old.

154 (70.64%) respondents declared that breast cancer imaging must be carried out annually, while 58 (26.61%) affirmed its essential performance every 6 months. Another examination exhibited 202 (92.6%) statements regarding mammograms or ultrasound necessities for early detection of breast cancer.

In the last knowledge examination, 155 (52.7%) applicants preferred mammography as a screening tool. It is why the remaining ones suggested the U/S tool instead of mammography as it is a more uncomfortable and painful technique.

Table 2 Evaluation of the knowledge level of the applicants

<b>Have you heard about breast mammography and U/S imaging?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	183	83.95
No	35	16.05
<b>How did you hear about it?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Breast cancer awareness campaigns	51	24.88
Family and or friends	15	7.05
Television/Radio or Newspaper	59	27.7
Social media	86	40.37
<b>Do you think that the late age of married increases the probability of breast cancer?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
No	41	18.89
Yes	95	43.32
Don't know	82	37.79
<b>Who should perform mammography?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Both female and male	111	50.92
Female only	107	49.08
<b>At what age should mammography be performed?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
After 40 years old	138	63.3
Before 40 years old	80	36.7
<b>How often should mammography/ultrasound be performed?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Annually	154	70.64
Every 4 months	6	2.75
Every 6 month	58	26.61
Total	218	100
<b>Mammogram/ultrasound is necessary for early detection of breast cancer?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Don't know	13	5.96
No	3	1.38
Yes	202	92.66
Total	218	100
<b>What is better for you if you want to perform a breast checkup?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Mammography	115	52.76
Ultrasound	103	47.24
Total	218	100

Table 3 Investigation of the applicants' attitudes

<b>Have you experienced Mammography or U/S, before?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
No	160	73.39
Yes	58	26.61
Total	218	100
<b>If yes, how many times?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
More than 3 times	22	19.82
One time	66	59.46
Twice	23	20.72
Total	111	100
<b>Why did you do Mammography or U/S?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Discharge	3	1.64
Fear from breast cancer	63	34.43
Follow up	34	18.57
Lump/ Pain	40	21.86

Requested	43	23.5
Total	183	100
<b>In case of follow-up, have you had a family history?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
No	179	85.65
Yes	30	14.35
Total	209	100
<b>If yes, who?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Father side	20	50
Mother side	20	50
Total	40	100
<b>If you don't have breast screening before, what is the reason?</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Afraid of the result	21	14.18
Lack of knowledge about mammography	14	9.46
Am feeling shame from the test itself	8	5.41
I haven't pain or swelling	88	59.46
Painful examination	17	11.49
Total	148	100

Details of the applicants' attitudes and practices towards the breast screening tools are listed in Table 3. Based on the obtained results, 73.39% of the respondents did not perform either mammography or U/S. Among the women who did these tests, 59.46% experienced one tool only once and 19.82% tried them more than 3 times. Based on the statements of these respondents, the following results were also approached: 34.43% were afraid of breast cancer, 23.5% tried the tools because of the request of their doctors, and 21.86% felt lump and pain. Among the 18.57% of the applicants who followed up these trials by their own opinions, 14.35% had observed breast cancer in both sides of their families. In the applicant cases who did not try any screening tools, the following information was obtained: 59.5% did not have lump or pain, 14.19% were afraid of the results, 11.49% were ashamed and afraid to perform the test, and 9.5% did not have enough idea about the screening tools.

Statistical evaluations are provided in Tables 4 to 6. As can be seen, educational level represented a significant effect on the knowledge towards mammography or U/S imaging tools ( $p$ -value=0.003). Also, it displayed a significant effect on the selected imaging tool ( $p$ =0.05). Moreover, there was a significant correlation between marital status and checkup performance related to a family history of the applicants ( $p$ =0.06).

**Table 4 Evaluation of the effect of educational level on the knowledge about breast imaging tools**

Educational level	Have you heard about mammography or U/S imaging before?		Frequency	Asymp. Sig. (2-sided)
	No	Yes		
Higher-level	29	171	200	0.003
Secondary school	4	12	16	
Uneducated	2	0	2	
Total	35	183	218	

**Table 5 Educational level impact on the applicants' desires regarding the selected breast screening tool**

Educational level	What is the better for you if you want to perform a breast screening test		Frequency	Asymp. Sig. (2-sided)
	Mammography	Ultrasound		

Higher-level	108	92	200	0.05
Secondary school	5	11	16	
Uneducated	2	0	2	
Total	115	103	218	

**Table 6 Correlation between the marital status and breast cancer background in the applicants' families**

Marital status	Do you have a family history?		Total	Asymp. Sig. (2-sided)
	No	Yes		
Divorced	14	0	14	0.06
Married	129	26	155	
Non-married	45	4	49	
Total	188	30	218	

## DISCUSSION

In general, early detection of cancer disease comprises two main strategies, including screening and early diagnosis. Screening equipment is applied in the screening step. The utilized tool is selected based on the cancer type. This is available for asymptomatic people to detect and treat cancers before being a threat to their health and well-being. The early diagnosis stage is also carried out based on public awareness improvement, particularly at the primary health care level of cancer [20].

A low level of involvement in screening practices could be attributed to the knowledge level of the respondents since knowledge and attitudes are stage-setting factors in health behavior [21].

Herein, all participants were randomly selected from different socioeconomic conditions through an electronic questionnaire. The conducted questionnaire was designed based on previous examinations linked with the Knowledge, Attitude, and Practice (KAP) effect on mammography and U/S tools.

According to the obtained results, the age and education level of the participants displayed significant impacts on the practice of mammogram and U/S tests. The observed trend ties well with the previous evaluation carried out by Miller, et al. [22].

Also, this examination showed a proper knowledge level of 83.95% of the applicants towards mammography or U/S breast cancer diagnostic tools. The obtained data is inconsistent with the Jose and Maria evaluation, which reported a good level of knowledge for 93.5% of the respondents [9]. Also, this investigation showed that 40.3% of the respondents obtained their knowledge from social media, while 27.7% approached it via watching TV, which is in agreement with the findings of the study performed by Godinho, et al. [23].

The obtained results also implied the significant influence of knowledge, regarding mammogram and U/S screening tools, on the practice of women. Based on this examination, 92.6% stated mammograms or U/S as the essential screening tools for early detection of breast cancer. This result is in agreement with a similar study, in which the level of knowledge about breast cancer was identified as significant [24].

According to another investigation, 63.3% declared that these screening tests should begin after the age of 40 years. Also, 70.64% preferred to perform screening trials annually.

In this study, 73.7% of the participants had experienced mammography or U/S tests, before. Among them, 59.4% performed the tools at least once. Whilst, 19.8% tried them more than three times in their lives. Moreover, 47.24% of them preferred U/S screening tool to mammography, due to more safety and superior convenience of this screening method. The result is in line with earlier literature that found 97.1% positive attitude towards mammography and there was an association between adequate attitude and higher education [24].

Among the applicants, 73.3% had never experienced mammography or U/S screening before. The result is following the findings of Redwhan and Yuri, which revealed a poor practice of mammography screening among women living in

Malaysia [25]. Aswad, et al. also displayed that about 74.5% of the Malaysian respondents never had mammography screening in their lifetimes, while a later Malaysian study showed that 10.5% of the participants, living in a suburban area of Terengganu, had never tried a mammogram [26,27]. This agrees with a Saudi study that reported that 29.0% of breast screening methods are useful for the early detection of breast cancer [28].

Among the screening methods mammography is the appropriate tool for screening, diagnosis, and examining breast lumps as reported by Mahbubi, et al. [29].

The current study represented the following reasons as key factors for performing mammography or U/S, including checkup as a result of being afraid of breast cancer (34.43%), request of the applicants' doctors (23.5%), having lump (21.8%), and periodically follow up (18.57%).

Among the evaluated respondents, only 13.8% had observed breast cancer background in their family members. The obtained data supports Kaplan, et al. study which concluded that there is no association between breast cancer family history and mammography usage [30].

Also, this study revealed a significant correlation between proper knowledge and education level among participants ( $p=0.003$ ), as well as the selected imaging modality ( $p=0.05$ ). Moreover, there is no significant correlation between marital status and performing checkup, which was in agreement with the previous Saudi study [31]. However, Khaldiga, et al. revealed poor knowledge and considerable negative attitude towards mammography in all age groups and educational levels, in the eastern region of Saudi Arabia [31]. Multiple logistic regression analysis displayed that the positive breast cancer in the family background is the only significant variable associated with the positive attitude regarding mammography ( $p<0.00001$ ) [32].

Female understanding of breast cancer and its screening does not affect their practice, but keeping them informed about breast cancer and screening. As a result, qualitative large prospective studies are still needed to improve Saudi women's practices of breast cancer screening methods, diagnosis, and early detection.

## CONCLUSION

The participants involved showed proper knowledge and adequate attitude about mammography and U/S as useful screening tools. Social media was the most common source of the obtained knowledge levels, followed by watching television. Overall, this evaluation implied that the public awareness estimation regarding breast cancer screening is of fundamental importance on early detection and treatment of this cancer type.

Relevant non-governmental or private organizations can make a significant contribution to breast cancer screening methods education by sponsoring screening awareness campaigns and workshops for the community.

## DECLARATIONS

### Ethical considerations

This study was conducted electronically to all females living in the Taif region and considered the consent of all the participants involved in the questionnaires by filling and send back the questionnaire again. All applicants took part in the evaluation voluntarily and they did not receive any payment.

### Acknowledgment

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### Conflicts of Interest

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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