

Assessment of knowledge and practice of mammography and breast self-examination among the general female population in Asir region of KSA

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Abstract. – **OBJECTIVE:** Breast cancer is the most common malignancy in Kingdom of Saudi Arabia (KSA) and an increasing burden in terms of incidence, morbidity and mortality. It accounts for about 28.7% of all new cancers in women. In 2015, the Saudi cancer registry shows that breast cancer was graded first among women and it accounts for 16.7% of all cancers reported among Saudi nationals. This study was designed to assess breast cancer screening knowledge and practices among women in the Asir region, Kingdom of Saudi Arabia.

MATERIALS AND METHODS: A cross-sectional study recruiting 1,021 female participants was performed. The variables included breast cancer knowledge, socio-demographic features, breast self-examination knowledge and practice. Descriptive statistics was used to compare and analyze the collected data while chi-square test was used to check the statistical significance among the selected variables. Saudi married women from Asir region were the participants of this cross-sectional study.

RESULTS: Our findings suggested that participants had a satisfactory level of knowledge about breast self-examination and mammograms at a rate of > 90% and 44.76% respectively. Over 90% of participants had good breast self-exam knowledge, however, only 6.37% was always performed breast self-examination. Similarly, nearly 40% of participants performed mammograms, while 40.5% were unaware. Leaflets and doctors were the primary sources of information for participants regarding the information of breast cancer screening.

CONCLUSIONS: Breast self-examination is a crucial approach to the timely detection of breast cancer and is subsequently critical for effective treatment. From the findings of this study we concluded that most women in the Asir re-

gion have a good awareness of breast cancer screening methods. However, either screening of self-examination or mammogram for breast cancer was not carried out thoroughly and regularly. This means that we must continue to emphasize the importance of primary health care in the earliest stages of breast cancer.

Key Words:

Breast cancer, Breast self-exam, Mammogram, Asir region, Saudi Arabia.

Introduction

Literature shows that there is an increasing burden of breast cancer in terms of incidence, morbidity and mortality related to breast cancer world-wide. Breast cancer is a most common malignancy in Kingdom of Saudi Arabia¹. It accounts for about 28.7% of all new cancers in women. In 2015, the Saudi cancer registry shows that breast cancer was graded first among women and it accounts for 16.7% of all cancers reported among Saudi nationals².

In the United States, 50% of new breast cancer cases occur in women over the age of 65 years, while in the Arab countries, including Saudi Arabia, it usually occurs in women at the age of 52 years. Numbers between the United States and KSA are not varying, but the difference is apparent in the age of patient and the stage of disease when it is diagnosed (MOH). According to studies in Europe and America, 1 in 8 women will develop breast cancer over the course of her lifetime³. In the KSA, breast cancer usually presents

at advanced stage than western countries. Yet, the apparent barriers to late presentation is not properly evaluated⁴. Mammography ensures early diagnosis and a better chance for treatment and recovery^{3,4}.

The risk factors of this disease are numerous, and their prevalence varies between racial and ethnic groups as well as geographical regions⁵. Several studies reported that the awareness of breast cancer is very low and adequately of obstacles have been reported among Arab women in previous studies⁶. It clearly shows that there is huge increase of incidence of breast cancer and it is expected to grow in near future. In addition, it brings terrible social, economic and public health implications. Breast cancer among Saudis is usually characterised by high aggressiveness, poor clinical pathological features and early onset⁵. It has also been reported that self-efficacy and fear of breast cancer can influence patients' screening behaviour.

The Centres for Disease Control and Prevention recommend mammography for breast cancer screening at least every two years for women aged 50-74 years old. The appearance of lumps does not necessarily mean cancer; it may be due to the presence of cysts, abscesses, or other benign tumours. Thus, it is also important to understand the awareness on mammogram among Saudi Female population. Currently, there is no sufficient knowledge on the causes of breast cancer, but there is knowledge of risk factors that increase the possibility of developing breast cancer. Therefore, prevention and early detection of the disease remains the cornerstone of breast cancer control⁷. Therefore, the current study was designed to understand the impact of specific demographic characteristics on practice of self-examination pattern and mammogram usage.

The aim of this cross sectional (quantitative) study was to estimate the impact of demographic characters on the self-breast examination and usage of mammogram for the early detection of cancer.

Materials and Methods

Study Design and Setting

This study followed a prospective cross-sectional design using an online self-administered questionnaire. The study took place in Asir region, Kingdom of Saudi Arabia using a convenience sampling strategy between November

2019 to January 2020.

Study Population and Sample Size Calculation

The study participants were female residents with an age of 18 years or older. According to the Saudi general authority for statistics, the total female population who are 18 years or older in Asir region was 694,930 in mid-2019. The minimum recommended sample size was 384 subjects. This was estimated using Raosoft® sample size calculator based on the population size, 5% margin of error ($p \leq 0.05$), 95% confidence interval and 50% response distribution.

Study Tools and Data Collection Process

Based on various previous studies that reflect different regions of Saudi Arabia, a self-administered, structured and closed-ended questionnaire was designed⁸. The survey questionnaire was created using Google forms as part of a cross-sectional study conducted over three months. Several different social media platforms (Twitter and WhatsApp) were used to draw upon a sample of female participants based in the Asir Region. The questionnaire was distributed across several females WhatsApp groups of various activities to target the female population of the Asir region. The survey was translated into Arabic. Initially, a self-administered questionnaire was created and the pilot sample was then validated to ensure its quality and internal reliability. The Cronbach Alpha factor was determined as 0.799. In addition, three experts working within this field provided advice regarding this process. The questionnaire was divided into two sections. The first section collected demographic information, while the second section contained closed-open and closed-ended questions aimed at learning about participants' attitudes on contraception.

Ethical Considerations

Ethical approval was granted by the King Khalid University Research Ethics Committee, approval reference (ECM#2019-87/HAPO-06-B-001).). All the study participants were explained the study method, importance of the study and other relevant matters to obtain an informed consent. Data were kept securely and were not used to identify respondents. Protocols of Helsinki's were followed while conducting the research.

Statistical Analysis

The questionnaires completeness and accuracy were confirmed, and then, entered into SPSS

version 24 (IBM Corp., Armonk, NY, USA). The participants demographics were represented descriptively. As all variables were categorical in nature, they reported frequencies and percentages. A multiple logistic regression model (χ^2) was conducted to investigate the factors that affect the intention to use mammogram methods in the future. The chi-square test will be used for categorical data. *p*-value was considered significant if it is less than 0.05, i.e., 5%.

Results

A total of 1021 volunteers agreed to participate in the study and send back the questionnaire. The majority (44.27%) of the survey participants were between the age of 18 to 29 years, 26.35% (n=269) aged between 30 and 40 years and the remaining 29.38% (n=300) were older than 40 years. Just below 1% of the participants (n=10) had no formal schooling, around 30% (n=296) had school education while the majority (70%) holds a university degree. The demographic data of the participants are summarised in Table I.

The majority of the participants (93.93%) in all education levels and age categories were aware about breast self-exam. Around 40% of the participants who had no formal schooling did not hear about breast self-exam practice. Just below two thirds (2/3) of those who had school education (58.3%) and university degree (63.1%) heard about breast self-exam from leaflets. However, around 67% (n=4) obtained this information from their doctor. Among the different age groups, the highest proportion of the participants (64.7% for 20-29 years age group, 62% for 30-40 years age group, and 56% for older than 40 years) indicated that they relied on leaflets to get information about breast self-exam. Breast self-exam was not practiced in just above half (57.69%) of the study sample and the percentage was higher in lower educational level and younger age groups. About 60.43% of the women who participated in this survey were convinced about breast self-exam effectiveness. The percentage, however, was higher among those with lower educational level and older age groups as shown in Table II-V.

Just above half (55.25%) of the study participants indicated that they did not hear about breast mammogram. The percentage was higher among women with lower educational level and younger age groups. Women who heard about mammogram indicated that they got the information from

Table I. Demographic information of the participants (n = 1021).

	n (%)
Age group	
18 -29 years	452 (44.27)
30 - 40 years	269 (26.35)
> 40 years	300 (29.38)
Education Level	
No formal schooling	10 (0.98)
School education	296 (28.99)
University degree	715 (70.03)

leaflets (48.14%), followed by doctor (30.6%), followed by family and friends (21.2%). However, the majority of women who had no formal schooling got information about mammogram from their doctor. Additionally, nearly half of those participants who had school education and university degree got their information from leaflets. The highest percentage of the participants (55.9% for 20-29 years age group, 50.4% for 30-40 years age group) indicated that they relied on leaflets to get information about mammogram. However, the majority of the participants (75.8%) who were older than 40 years old were equally divided between leaflets and doctors as a source of information. Suspicion of breast cancer sign and symptoms was found as the main motivation to undergo mammogram for around 50% of the study sample and about 40% did not know what was their motivation for this. Higher proportion of those participants who had no formal schooling did not know about their motivation to do mammogram. Around two thirds of the participants who are above the age of 40 years indicated that suspicion of breast cancer was the main motivation for them to undergo mammogram. About 40% of the study sample did not know how frequent should a woman undergo a mammogram, and a similar proportion of them thought the frequency should be a yearly basis. A larger proportion of those who indicated that they did not know were in the younger age groups, i.e., 20-29 years and 30 to 40 years. However, a larger percentage of participants who indicated that the mammogram should be done yearly were those who are older than 40 years.

Discussion

Proper precautionary policies and strategies fo-

Table II. Level of education and breast Self-Exam (SE) practices.

	Total n=1021	No formal schooling n=10	School Education n=296	University Degree n=715	p-value
Heard about SE					< 0.001
Yes	959 (93.93%)	6 (60.0%)	276 (93.2%)	677(94.7%)	
No	62 (6.7%)	4 (40.0%)	20 (6.8%)	38 (5.3%)	
Source of info about SE					< 0.001
Family and friends	163 (16.99%)	1 (16.67%)	65 (23.6%)	97 (14.3%)	
Doctor	207 (21.58%)	4 (66.67%)	50 (18.16%)	153 (22.6%)	
Leaflets	589 (61.42%)	1 (16.67%)	161 (58.3%)	427 (63.1%)	
Practice SE					0.44
No	589 (57.69%)	7 (70.0%)	185 (62.5%)	397 (55.5%)	
Rarely	101 (9.89%)	1 (10.0%)	27 (9.1%)	73 (10.2%)	
Sometimes	266 (26.05%)	1 (10.0%)	69 (23.3%)	196 (27.4%)	
Always	65 (6.37%)	1 (10.0%)	15 (5.1%)	49 (6.9%)	
Effectiveness of SE					0.93
Don't know	334 (32.71%)	3 (30.0%)	97 (32.8%)	234 (32.7%)	
Not convincing	70 (6.86%)	0 (0.0%)	20 (6.8%)	50 (7.0%)	
Convincing	617 (60.43)	7 (70.0%)	179 (60.5%)	431 (60.3%)	

cusing on both primary and secondary preventive mechanisms are desirable to decrease the occurrence of breast cancer. One crucial strategy is to evaluate the awareness and knowledge of breast cancer and breast self-examination and the second major approach is to help increase breast self-examination among vulnerable women⁹. This study was conducted among women in the Asir region, aged 18 years or older, to evaluate the knowledge of breast cancer and explore their awareness of breast self-examination and mammogram as a screening strategy for the early diagnosis of cancer. Advancing society's awareness of breast cancer will increase the chances of early diagnosis and improve prognosis.

The most frequent breast cancer in KSA is breast cancer, while breast cancer cases in the Middle East are expected to increase four times in the next twenty years. Breast cancer has early effects in Saudi women, which imposes social and economic expenses compared to developed countries. The majority of cases are diagnosed later, resulting in poor recovery rates. Breast cancer awareness is essential for early detection and prevention and general healthcare facilities will be the first contact point for women and their families inside that healthcare system. Increased knowledge of the procedures for screening breast cancer will lead to early intervention, diagnosis and survival^{9,10}. In the present study, the majority of the participants (70%) have university degree, while only 0.98% holds no formal schooling. Consequently, 93.93% are aware

of the breast self-exam, while majority of them have educational background, which is similar to the previous study reported in Riyadh¹¹. Additionally, 60.43% of the participated women were convinced with the breast self-exam effectiveness. Around half of the participants in the earlier findings at Najran, Saudi Arabia, displayed low awareness about breast cancer (54.4%) and breast self-exam (56.8%). In addition, the study found that 35% of women who visited the primary healthcare centres underwent breast self-examinations⁹. The results can be compared to previous studies in Abha, Buraidah, and Al Hassa in Saudi Arabia^{1,12,13}. In addition, a study in Ain Shams University Hospitals, Egypt, revealed that TV (42.9%), radio and newspapers (3.9% each) and the Internet and health education in some primary health facilities were the most prevalent sources utilized by the participants to obtain information (23.9% and 22.6%, respectively)¹⁴.

In the present study, 61.42% of participants took information about breast self-exam from leaflets, while 21.58% and 16.99% from doctors and family, respectively. However, the findings about the breast self-exam practices are significantly ($p < 0.001$) correlated with the age groups, whereas more than 50% of the participants were not practice breast self-exam effectiveness. However, more than 90% of the participants were acknowledge that they are heard about breast self-exam. Similar type of findings observed in previous couple of study, whereas the age groups play an important role in breast can-

Table III. Age groups and Breast Self-Exam (BSE) practices.

	Total n=1021	20 -29 years n=452	30 - 40 years n=269	> 40 years n=300	p-value
Heard about SE					0.76
Yes	959 (93.93%)	422 (93.4%)	253 (94.1%)	284 (94.7%)	
No	62 (6.7%)	30 (6.6%)	16 (5.9%)	16 (5.3%)	
Source of info about SE					0.3
Family and friends	163 (16.99%)	61 (14.5%)	46 (18.2%)	56 (19.7%)	
Doctor	207 (21.58%)	88 (20.9%)	50 (19.8%)	69 (24.3%)	
Leaflets	589 (61.42%)	273 (64.7%)	157 (62%)	159 (56%)	
Practice SE					< 0.001
No	589 (57.69%)	281 (62.2%)	156 (58.0%)	152 (50.7%)	
Rarely	101 (9.89%)	54 (11.9%)	16 (5.9%)	31 (10.3%)	
Sometimes	266 (26.05%)	102 (22.6%)	73 (27.1%)	91 (30.3%)	
Always	65 (6.37%)	15 (3.3%)	24 (8.9%)	26 (8.7%)	
Effectiveness of SE					0.06
Don't know	334 (32.71%)	166 (36.7%)	76 (28.3%)	92 (30.7%)	
Not convincing	70 (6.86%)	33 (7.3%)	22 (8.2%)	15 (5.0%)	
Convincing	617 (60.43)	253 (56.0%)	171 (63.6%)	193 (64.3%)	

cer knowledge^{9,14,15}.

Global standard screening for early breast cancer detection is mammography. Regular screening of mammograms has been associated with lower breast cancer death rates of about 20% to 25%^{16,17}. In Saudi Arabia, the government has offered the general public free mammograms *via* health workers and others, namely the Zahra Breast Cancer Association. Although mammograms are available free of charge by the government, most wom-

en still do not use these screenings⁹. In the present study, both the age and educational groups reported similar percentage regarding the knowledge of mammogram practices, whereas half of them are aware about mammogram. However, the motivations towards mammogram are below 50%, while 39.3% are not aware of the mammogram. Similar low percentage also observed in previous study in KSA^{1,9,18,19}. In other Islamic countries, the awareness about mammogram was found similarly low

Table IV. Level of education and mammogram (MG) practices.

	Total n=1021	No formal schooling n=10	School Education n=296	University Degree n=715	p-value
Heard about MG					0.62
Yes	457 (44.76%)	4 (40.0%)	126 (42.6%)	327 (45.7%)	
No	564 (55.24%)	6 (60.0%)	170 (57.4%)	388 (54.3%)	
Source of info about MG					0.32
Family and friends	97 (21.23%)	1 (25.0%)	32 (25.4%)	64 (19.6%)	
Doctor	140 (30.63%)	3 (75.0%)	34 (27.0%)	103 (31.5%)	
Leaflets	220 (48.14%)	0 (0.0%)	60 (47.6%)	160 (48.9%)	
Motivation to do MG					0.003
Age > 30 years	107 (10.5%)	0 (0.0%)	16 (5.4%)	91 (12.7%)	
Suspicion of Breast Cancer signs and symptoms	513 (50.2%)	4 (40.0%)	148 (50.0%)	361 (50.5%)	
Don't know	401 (39.3%)	6 (60.0%)	132 (44.6%)	263 (36.8%)	
Frequency should you do MG					0.74
Monthly	98 (9.6%)	2 (20.0%)	28 (9.5%)	68 (9.5%)	
Yearly	400 (39.2%)	4 (40.0%)	108 (36.5%)	288 (40.3%)	
Every 2 years	92 (9%)	1 (10.0%)	26 (8.8%)	65 (9.1%)	
Every 10 years	18 (1.8%)	0 (0.0%)	3 (1.0%)	15 (2.1%)	
Don't know	413 (40.5%)	3 (30.0%)	131 (44.3%)	279 (39.0%)	

Table V. Age groups and mammogram (MG) practices.

Question	Total n=1021	20-29 years n=452	30-40 years n=269	> 40 years n=300	p-value
Heard about MG					<0.001
Yes	457 (44.76%)	177 (39.2%)	119 (44.2%)	161 (53.7%)	
No	564 (55.24%)	275 (60.8%)	150 (55.8%)	139 (46.3%)	
Source of info about MG					0.001
Family and friends	97 (21.23%)	30 (17.0%)	28 (23.5%)	39 (24.2%)	
Doctor	140 (30.63%)	48 (27.1%)	31 (26.1%)	61 (37.9%)	
Leaflets	220 (48.14%)	99 (55.9%)	60 (50.4%)	61 (37.9%)	
Motivation to do MG					0.001
Age > 30 years	107 (10.5%)	56 (12.4%)	28 (10.4%)	23 (7.7%)	
Suspicion of Breast Cancer signs and symptoms	513 (50.2%)	207 (45.8%)	121 (45.0%)	185 (61.7%)	
Don't know	401 (39.3%)	189 (41.8%)	120 (44.6%)	92 (30.7%)	
Frequency should you do MG					0.001
Monthly	98 (9.6%)	56 (12.4%)	25 (9.3%)	17 (5.7%)	
Yearly	400 (39.2%)	161 (35.6%)	105 (39.0%)	134 (44.7%)	
Every 2 years	92 (9%)	41 (9.1%)	13 (4.8%)	38 (12.7%)	
Every 10 years	18 (1.8%)	9 (2.0%)	3 (1.1%)	6 (2.0%)	
Don't know	413 (40.5%)	185 (40.9%)	123 (45.7%)	105 (35.0%)	

where only 21.5% of Iranian women, 22.5% of Qatar and 39.4% of Turkish Republic were aware about mammogram²⁰⁻²². Mammograms at age 40 are offered by the American college of obstetricians and gynaecologists and the American Cancer Society²³. In the current study, 35% of the participants aged older than 40 years were not aware that they had to do the mammogram regularly, while 44.7% considered doing it yearly. Likewise, almost similar percentage of findings (40.3%) was reported for the participants who have university degree. In a study carried out among Arab women residing in Qatar, 24.4% of respondents discussed breast cancer with their doctors²⁴, while in our study 30% acquired the information about the mammogram from the doctors.

The present outcomes showed that higher education boosts people's knowledge, which was also reported in the previous study. This is clearly because better levels of education allow people to discover information and have a favourable attitude towards their evaluation sources about various diseases^{25,26}. In this study, leaflets were the primary source of information on breast cancer, while some other studies reported the social media was influential for awareness. An annual event to raise breast cancer awareness was organized by the Minister of Health in Saudi Arabia during the International Breast Cancer Aware-

ness in October^{1,9}.

Conclusions

The findings of this study show an overall lack of punctuality of breast self-examination among rural women in the Asir region of KSA. It is observed in the current study that most women show a satisfactory understanding of the methods of screening for breast cancer. However, the self-examination or mammography was not thoroughly screened by the participants. Further attention must be placed into raising awareness of mammograms to early breast cancer identification by women health care providers.

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Data Availability

Data will be available on demand or request.

Conflicts of interest

The authors declare no conflicts of interest.

Authors' Contributions

All authors contributed equally.

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