

# Investigating the awareness of breast cancer among female pharmacy students in the Makkah region, Saudi Arabia

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Received: August 2022 Accepted: September 2022; Published: October 1, 2022.

Citation: Jumana Sako et al. Investigating the awareness of breast cancer among female pharmacy students in the Makkah region, Saudi Arabia. World Family Medicine. 2022; 20(10): 14-20. DOI: 10.5742/MEWFM.2022.9525175

## Abstract

Breast cancer (BC) is one of the causes of the leading mortality in Saudi Arabia. Previous studies have shown a recent dramatic increase in BC cases in Saudi Arabia. Therefore, the demand is high for measuring the level of awareness among young Saudi females about BC and its causes. This study is designed to assess the awareness level of female pharmacy students in the Faculty of Pharmacy, Umm Al-Qura University, Makkah region, Saudi Arabia about the general information regarding BC, as pharmacists are the health practitioners most accessible to the public. The data in this study were collected using a modified online questionnaire delivered to 217 participants in the College of Pharmacy. Our results showed a sufficient awareness level among future female pharmacists, which may help in spreading their knowledge to society.

**Keywords:** breast cancer, awareness, public health, pharmacist, Saudi Arabia

## Introduction

The most common type of cancer in developed and developing countries is breast cancer (BC), and the main reason for this spread in developed countries is lifestyle and urbanisation(1). In the Kingdom of Saudi Arabia, the number of cases has increased significantly, and the incidence tends to vary according to geographic areas, with the highest incidences being observed in the country's eastern, central and western regions (2). A recent study assessed the burden of BC mortality in Saudi Arabia and noted that between 2025 and 2050, deaths due to BC are expected to double (3).

The two types of risk factors for BC are modifiable factors such as weight, diet, exercise, smoking and drinking alcohol, and non-modifiable factors such as gender, age at the time of diagnosis, and family history. Approximately 5-10% of BC is thought to be linked to changes (mutations) in the BC gene (BRCA 1 and BRCA 2 ), which can lead to ovarian cancer and several other types of cancer, menstrual age, breastfeeding, menopause and exposure to chest rays (4-6).

The role of health promotion and education is essential in minimising the later stages of BC. Women must be encouraged to gain comprehensive information regarding early detection of BC, learn how to do breast self-examination, and ask for mammography testing when needed (7, 8). Studies have been conducted in the Kingdom of Saudi Arabia measuring community awareness (2).

In general, women should have sufficient awareness of BC and how to perform the examination, and pharmacists are the most accessible healthcare professionals to the general public. Most patients regularly visit community pharmacies for health information, including cancer information (9). Pharmacists are therefore in a good position to raise awareness, so our study aims to assess the awareness of female pharmacy students about BC in Umm Al-Qura University, Makkah region, Saudi Arabia.

## Methods

### Ethical approval

The Biomedical Research Ethics Committee, Umm Al-Qura University, Makkah, Saudi Arabia, approved the study. Approval number: (HAPO-02-K-012-2021-10-781), under the Declaration of Helsinki.

### Study design

This cross-sectional descriptive study was conducted in the Makkah region of Saudi Arabia. The research was performed from September 2020 to September 2021. A computer-based survey about BC was done electronically. A standardised questionnaire consisting of 34 questions was distributed and answered by all participants. The questionnaire, with some changes, was designed using frequently asked questions from a study by Ashareef et al., 2020 (10). It was written in Arabic.

### Sample size and data collection

The sample size required for the study was calculated based on Cochran's formula  $n = n_0 / ((n_0 - 1) + (z^2 pq) / e^2)$ , where  $n_0 = (z^2 pq) / e^2 = 385$ ,  $N =$  population size = 477, so  $n =$  size of the sample = 214. We used multiple methods such as social media channels to facilitate the distribution of the survey. All the data were collected from the Google Forms website. Then, all data were placed in a spreadsheet and moved to Microsoft Excel.

### Statistical analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 22.0 (SPSS Inc., Chicago, IL, USA). All categorical variables were presented as frequencies and percentages (%). A Pearson Chi-square test was used to assess the differences between variables. Statistical significance was determined at a p-value of  $<0.05$ .

## Results

Figure 1 shows the ages of the study participants. A total of 217 participants completed the questionnaire, with a response rate of 100%. The highest age range of participants was between 22 and 24 years (57%), followed by 19 to 21 years (42%) and 25 years and above (1%).

As shown in Table 1, 99% of participants indicated that BC is the most common type of cancer in women. While 89.9% of participants had an idea of BC, 83% of participants answered that men can get BC, 61.8% of participants answered that BC in men is the same as in women and 18% of participants had a family member diagnosed with BC. In addition, 79.7% of participants thought the factors fatty meals and drinking alcohol, Vitamin D deficiency and increased age may cause BC.

Moreover, 72.8% of participants said environmental factors affect the incidence of BC, while 99.5% thought early detection of BC contributes to reducing the mortality rate among women. Over half (55.3%) of participants had information about BC screening methods, 15.2% had undergone BC examination, 73.2% thought the appropriate age to start periodic examination was between 29 and 40 years, and 69.5% of participants said periodic examination should be performed every year. While 7.8% of participants thought a mammogram can cause BC, 96.3% thought multiple treatments are available for BC (chemotherapy, hormonal therapy and surgical), and 54.2% of participants mentioned self-examination as one of the BC screening methods, as shown in Table 1.

As shown in Table 2, there was a significant association ( $P = 0.044$ ) between the responses to men getting BC and the age of the female pharmacy students. In addition, there was a significant association ( $P = 0.026$ ) between responses to environmental factors that affect the incidence of BC and the age of the female pharmacy students. However, for the other responses, there were no significant associations.

Table 1: Responses of female pharmacy students as frequency and percentage

Questions	Frequency (%)
<b>The most common type of cancer in women is?</b> <ul style="list-style-type: none"> <li>• Colon cancer</li> <li>• Breast cancer</li> <li>• Leukaemia</li> </ul>	2 (0.9%) 215 (99.1%) 0 (0%)
<b>Do you have an idea about breast cancer?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	195 (89.9%) 11 (5.1%) 11 (5.1%)
<b>Is it possible for men to get breast cancer?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	181 (83.4%) 12 (5.5%) 24 (11.1%)
<b>Is breast cancer in men the same as in women?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	34 (15.7%) 49 (22.6%) 134 (61.8%)
<b>Have any of your family members been diagnosed with breast cancer?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	39 (18%) 172 (79.3%) 6 (2.8%)
<b>Which one of these factors may cause breast cancer?</b> <ul style="list-style-type: none"> <li>• Fatty meals and drinking alcohol</li> <li>• Vitamin D deficiency</li> <li>• Increased age</li> <li>• All the above</li> </ul>	14 (6.5%) 3 (1.4%) 27 (12.4%) 173 (79.7%)
<b>Can environmental factors affect the incidence of breast cancer?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	158 (72.8%) 11 (5.1%) 48 (22.1%)
<b>Does early detection of breast cancer contribute to reducing the mortality rate among women?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	216 (99.5%) 0 (0%) 1 (0.5%)
<b>Do you have information about breast cancer screening methods?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	120 (55.3%) 97 (44.7%)
<b>Have you ever had a breast cancer examination?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	33 (15.2%) 184 (84.7%) 0 (0%)
<b>In your opinion what is the appropriate age to start periodic examinations?</b> <ul style="list-style-type: none"> <li>• 29-40 years</li> <li>• 39-50 years</li> <li>• I don't know</li> </ul>	159 (73.2%) 49 (22.5%) 9 (4.1%)

Table 1: Responses of female pharmacy students as frequency and percentage (continued)

<b>How often is the periodic examination performed?</b> <ul style="list-style-type: none"> <li>• Every year</li> <li>• Every two years</li> <li>• I don't know</li> </ul>	151 (69.5%) 38 (17.5%) 28 (12.9%)
<b>Do you think that a mammogram (X-ray picture of the breast) causes breast cancer?</b> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	17 (7.8%) 109 (50.2%) 91 (41.9%)
<b>What treatment is available for breast cancer?</b> <ul style="list-style-type: none"> <li>• Chemotherapy</li> <li>• Hormonal therapy</li> <li>• Surgical</li> <li>• All the above</li> </ul>	1 (0.5%) 1 (0.5%) 6 (2.7%) 209 (96.3%)
<b>Do you have information about breast cancer screening methods?</b> <ul style="list-style-type: none"> <li>• By self-examination</li> <li>• By mammogram</li> <li>• By ultrasound</li> <li>• By MRI</li> <li>• By biopsy</li> </ul>	84 (54.2%) 50 (32.3%) 17 (11%) 3 (1.9%) 1 (0.6%)

Figure 1. Age percentage of the study participants (N= 217)

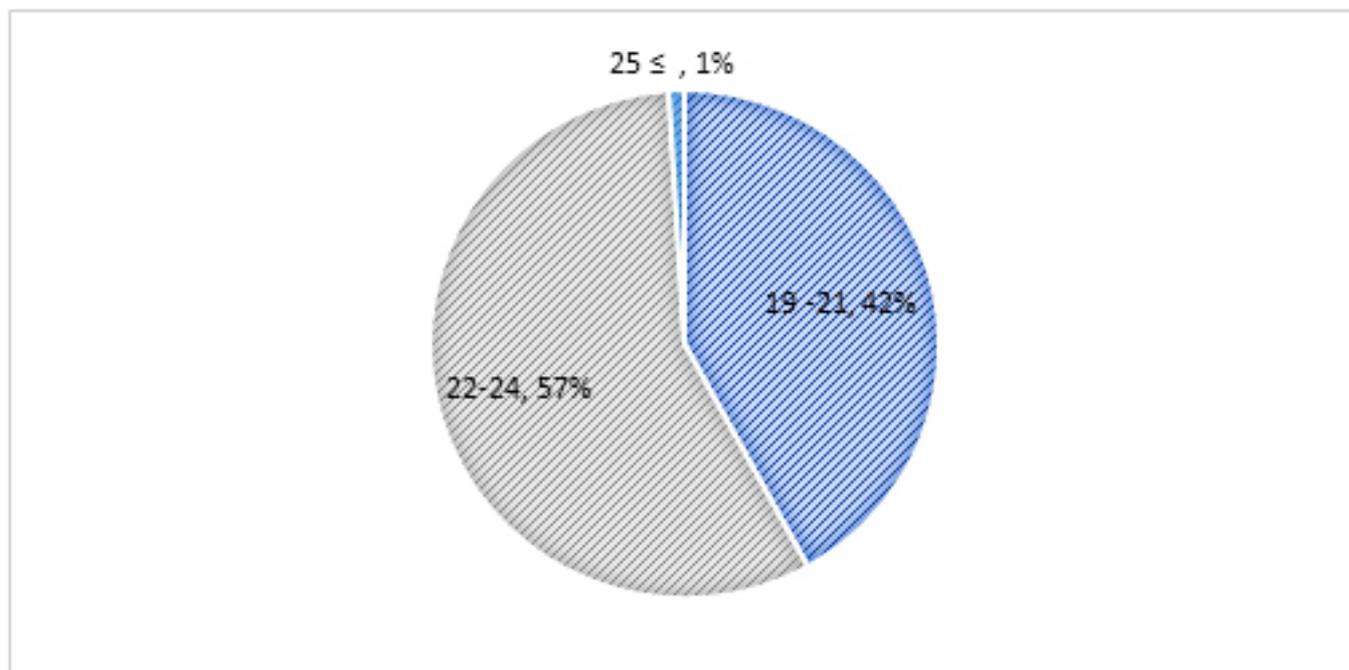


Table 2: Association of breast cancer awareness and age of the students

Questions	19-21	22-24	≤ 25	P-value
The most common type of cancer in women is? <ul style="list-style-type: none"> <li>• Colon cancer</li> <li>• Breast cancer</li> <li>• Leukaemia</li> </ul>	0 91 0	0 120 0	2 3 0	0.877
Do you have an idea about breast cancer? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	80 3 8	111 0 0	3 8 3	0.770
Is it possible for men to get breast cancer? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	83 4 4	96 8 18	1 0 2	0.044
Is breast cancer in men the same as in women? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	14 22 55	20 24 79	0 3 0	0.066
Have any of your family members been diagnosed with breast cancer? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	17 72 2	22 96 4	0 3 0	0.990
Which one of these factors may cause breast cancer? <ul style="list-style-type: none"> <li>• Fatty meals and drinking alcohol</li> <li>• Vitamin D deficiency</li> <li>• Increased age</li> <li>• All the above</li> </ul>	9 1 7 75	0 0 0 95	5 2 19 3	0.206
Can environmental factors affect the incidence of breast cancer? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	53 9 29	101 0 19	3 2 0	0.026
Does early detection of breast cancer contribute to reducing the mortality rate among women? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	91 1 0	121 0 0	3 0 0	0.971
Do you have information about breast cancer screening methods? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	48 43	96 53	2 1	0.828
Have you ever had a breast cancer examination? <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• I don't know</li> </ul>	14 77 0	17 104 0	0 3 0	0.276
In your opinion what is the appropriate age to start periodic examinations? <ul style="list-style-type: none"> <li>• 29-40 years</li> <li>• 39-50 years</li> <li>• I don't know</li> </ul>	67 20 4	88 29 5	3 0 0	0.920

**Table 2: Association of breast cancer awareness and age of the students (continued)**

<b>How often is the periodic examination performed?</b>				
• Every year	65	82	3	0.706
• Every two years	16	22	0	
• I don't know	10	17	0	
<b>Do you think that a mammogram (X-ray picture of the breast) causes breast cancer?</b>				
• Yes	7	10	0	0.799
• No	45	60	3	
• I don't know	39	52	0	
<b>What treatment is available for breast cancer?</b>				
• Chemotherapy	2	1	0	0.950
• Hormonal therapy	0	1	0	
• Surgical	4	2	0	
• All the above	85	119	3	

## Discussion

The goal of this study was to find out how well female pharmacy students at UQU in Makkah were aware of BC. The level of understanding and attitudes of healthcare professionals concerning BC screening methods are major factors in their patients' use of these methods (11). BC is the leading cause of female cancer-related disability and mortality. In Saudi Arabia, BC ranks first among cancerous diseases in females (12). A clinical study showed that the percentage of those who believed that BC was common among women in Saudi Arabia was 86.5% (13). In other studies, 76% of medical students and 67% of non-medical students knew that BC is one of the most prevalent cancers in the Saudi community (14).

In our study, 83% of participants answered that men can get BC and 15.7% answered that the BC risk is the same in men and women. Similarly, another study found that BC risk in men and women is the same but the BC in men is more sensitive to hormone therapy (15). Moreover, the percentage of those who believed that males could get BC was 49.3% (16). Our study showed that 18% of participants had a family member diagnosed with BC, similar to another study that showed that 18% of both medical and non-medical university students had a positive family history of BC (14). In the nurses' health study follow-up, the highest risk is associated with an increasing number of first-degree relatives diagnosed with BC at a young age (under age 50). Compared with women who had no affected relative, women who had one, two or three or more affected first-degree relatives had risk ratios of 1.80, 2.93 and 3.90, respectively (17).

BC is most commonly diagnosed at late stages in countries with limited resources. Early detection of BC reduces the death rate as it enables simpler and more cost-effective treatment (18). Almost all participants (99.5%) in our study thought early detection of BC contributes to reducing the mortality rate among women, similar to 91% of participants in another study who knew that early detection of breast cancer improves treatment outcomes (19). The finding of our study showed that the participants have a good idea about early

diagnosis, which could positively affect outcomes for patients and decrease mortality. These findings supported a previous study in Sudan and found that the women who participated in the study also have good knowledge about the importance of diagnosis of BC, which helps to detect cancer in its early stages (20).

In our study, 55.3% of participants had information about BC screening methods, while 61% of medical and 50% of non-medical students performed breast self-examination and 24% of the participants knew that periodic mammography is an important tool for early screening of BC and only 3% of students involved in this study confirmed having been screened by mammogram (14, 21). Moreover, 7.8% of participants thought a mammogram can cause BC. It has been estimated that 10 years' worth of annual mammographic screenings in 10,000 women will cause one additional BC (22).

Our study may not be representative because of its design (online survey), which could be a limitation. Despite that, the present study conducted among pharmacy students in Saudi Arabia will add to our knowledge in this area as we still have a limited number of studies addressing BC awareness. Therefore, it is important to create awareness, educate the community and remove misconceptions associated with ignorance through community awareness campaigns.

## Conclusion

Women have poor knowledge of BC, whether it is related to risk factors or signs and symptoms that influence early detection procedures. Therefore, women should have sufficient awareness about BC and how to perform breast self-examination, and pharmacists are the most accessible healthcare professionals for the general public. Our study found that pharmacy students have sufficient awareness of BC, so they constitute a mainstay in raising awareness of BC.

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