Knowledge, and Screening Behaviours of Saudi Female Teachers Towards Breast Cancer in Description Buraydah, Saudi Arabia

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**SUBJECT AREAS**

- Internal Medicine
- Preventive Medicine

**KEYWORDS**

- knowledge, breast cancer, diabetes, breast self-examination, female teacher, Saudi Arabia
Abstract

**Background** Breast cancer is the second commonest cause of cancer-related deaths in Saudi Arabia and the commonest type of female cancer. However, unfortunately several women bypass early discovery and management possibilities related to the shortage of data, knowledge, and recognition of breast cancer, as well as cancer screening manners in general. This study aims to assess the knowledge, and screening behaviour of female teacher regarding breast cancer.

**Methods** This cross-sectional study was conducted in the governmental secondary girls’ schools in Buraydah city, Saudi Arabia, during the period 2018-2019. A cluster multistage random sampling technique was used to recruit female teacher. The data were collected through a self-administered questionnaire.

**Results** The study included 316 female teachers. The age of 55.4% of them was below 40 years. The total breast cancer knowledge score was abnormally distributed, as evidenced by significant Shapiro-Wilk test, p < 0.001. The mean ± SD score was 10.66 ± 3.73 (maximum possible score was 15) and the median (IQR) was 11 (8–13). Less than half (42.7%) of the teachers reported performing BSE while only 9.5% went to a clinic for clinical breast examination. BSE was performed on monthly basis by only 14.8% of those practiced it. Ignorance of the examination and fear to discover a tumour were mentioned by 24.9% for each as a reason for not performing BSE whereas 42.5% of those who did not practice it had no reason for that. Mammogram was ever practiced by 22.5% of the female teachers. About one-third of the participants (33.5%) claimed that they will perform mammogram in the coming year. Older teachers (40–50) reported higher rates of performing mammogram compared to those aged < 40, p = 0.012. Also, teachers who had friends with breast cancer were practiced mammogram at higher rated than their counterparts, p = 0.025.

**Conclusions** The study indicates that breast cancer knowledge among governmental female secondary school teachers in Buraydah city, Saudi Arabia is overall insufficient, regarding risk factors and clinical presentation. Performance of breast cancer screening techniques is not enough. Improving knowledge regarding breast cancer risk factors, presentation and screening tools as BSE and mammogram through educational programs is highly recommended for prevention and early
detection.

**Background**

Breast cancer (BC) is the commonest cancer of women worldwide with nearly 1.7 million new cases of BC were diagnosed in 2012 which represents 25% of all women cancers and fifth most common cause of death in women. The worldwide rate for mortality from BC ranged between 6 per 100,000 in Eastern Asia to 20 per 100,000 in Western Africa. Breast cancer is the second commonest cause of cancer-related deaths in Saudi Arabia and the commonest type of female cancer. In Saudi Arabia, the incidence rate of breast cancer was 1% according to the Saudi Cancer Registry (2001–2008), and the overall survival rate was lower than those reported in United Kingdom and United States of America; mostly this attributed to due to the non-existence of a standard nationwide breast screening program in the kingdom and low uptake of screening.

According to the recommendations from the Society of Breast Imaging and the ACR, women have a sense to recognize and describe any breast abnormalities immediately to their healthcare providers through breast self-examination (BSE). In order to slow down the rising incidence of breast cancer, hindering of the increasing prevalence of its risk factors accompany improving economic conditions is recommended. The most effective method that can control this is the early detection of breast cancer. Early detection was seen as one of the most promising long-term strategies for preventing disease-related deaths.

In Saudi, primary healthcare centers are the primary centers communicate with the patient and providing free public healthcare. However, unfortunately several women bypass early discovery and management possibilities related to the shortage of data, knowledge, and recognition of breast cancer, as well as cancer screening manners in general.

Among local published health literacy studies. Few studies were found that examined the knowledge of female teachers in Saudi Arabia particular Buraydah. Therefore, our objectives are to assess the knowledge and screening behaviour of female teacher regarding breast cancer.
Methods, Study Design And Setting
Study setting
A cross-sectional study was conducted using a self-administered questionnaire among female teacher working at governmental secondary girls’ school in Buraydah, Saudi Arabia, during the period from September 2018 to March 2019.

According to the database of the Menstrual of education in Buraydah, approximately 1739 female teacher work in 40 governmental secondary girls’ school in the city of Buraydah. All female teacher working at governmental secondary girls’ school primary in Buraydah were eligible for inclusion. All female teacher who were on an extended leave of duty, and teachers who declined to participate were excluded.

A cluster multistage random sampling technique was employed. For the purpose of the study, governmental secondary girls’ school were clustered according to the city’s geographic divisions into tow region (southern and northern), with 25–15 secondary girls’ school in each region. Of these secondary girls’ school, 10 schools’ in each region were randomly chosen. Therefore, 20 secondary girls’ school were included in the study.

Sample size
The sample size was calculated using a standard sample size equation “n = z^2p(1-p)/e^2” and an assumed proportion of 50% (proportion of high school females’ teacher who had correct knowledge, and recognition of breast cancer, as well as cancer screening). Using a 95% confidence interval and a 5% margin of error, the sample size was estimated to be 316 and was adjusted to 378 to compensate for the non-response rate.

Participants and survey instrument
All females’ teacher present at the time of data collection in the selected schools were included; hard copies of the questionnaires were delivered to the available teacher. Without seeing it first, the teachers were asked to complete the anonymous self-administered survey in Arabic in order to assess their basic background knowledge.

The data were collected using a valid pretested structured self-administered questionnaire, adopted from a similar study carried out by Al-Zalabani et al. 2018. The questionnaire is divided into three
parts with a total of 39 questions. The first part includes socio-demographic data covered age, marital situation and family or friend’s history of breast cancer. The second part assesses breast cancer knowledge and information associated to the practice based on 21 questions, including questions regarding the breast cancer risk factors (16 questions) and its clinical presentation (5 questions). The final question inquiries about the best time to perform BSE. The source of information about breast cancer was added. A score of “1” was assigned to correct answers while a score of “0” was assigned to wrong or don`t know answers. The total score was computed for each participant and tested for normality using Shapiro-Wilk statistical test. The third part includes questions about participants practice concern such as BSE, clinical breast examination and mammogram. At the end of this part, barriers towards performing mammography were identified in 11 questions which marked as: 1 as totally disagree; 2 as disagree; 3 as neutral; 4 as agree; and 5 as totally agree. Their responses were re-coded as follows: totally agree and agree = 1, whereas totally disagree, disagree, and neutral = 0.

Data management and analysis plan

Data were coded and entered using SPSS 25.0 version statistical software. Descriptive statistics (mean, standard deviation, frequencies and percentages) were used to describe the quantitative and categorical variables. Pearson’s Chi-square test was used to assess the association between the categorical variables. Non-parametric statistical tests (Mann-Whitney and Kruskal-Wallis) were applied to compare groups since the knowledge about breast cancer score was abnormally distributed as evidenced by significant Shapiro-Wilk test. A p-value of ≤ 0.05 was used to report the statistical significance and precision of the results.

Ethical considerations

Approval for the study was obtained from the Institutional research committee, College of Medicine, Qassim University (no. 20180615), AL Qassim, Saudi Arabia. Official approval letters were obtained from the minister of education in AL Qassim. Each participant received the questionnaire and was informed about the objective of the present study. The Institutional research committee has agreed that completing the questionnaire will imply consent.

Results

Sample characteristics
Three hundred and sixteen of female teachers completed the questionnaires (response rate of 100%).

Table 1 shows participants’ socio-demographic characteristics. More than half of the participants (55.4%) were below 40 years. Majority of them were married (91.8%) whereas 4.1% were single. Family history of breast cancer was reported among almost a quarter of them (25.9%) while friend history of breast cancer was mentioned by 22.5% of the teachers.

| Categorical variables                  | N   | %   |
|----------------------------------------|-----|-----|
| Age                                    |     |     |
| < 40                                   | 175 | 55.4% |
| 40                                     | 141 | 44.6% |
| Marital status                         |     |     |
| single                                 | 13  | 4.1% |
| Married                                | 290 | 91.8% |
| Divorced/Widowed                       | 13  | 4.1% |
| Family history of breast cancer        |     |     |
| Yes                                    | 82  | 25.9% |
| No                                     | 234 | 74.1% |
| Friend history of breast cancer        |     |     |
| Yes                                    | 71  | 22.5% |
| No                                     | 245 | 77.5% |
| Main source of information             |     |     |
| Reading                                | 40  | 12.65% |
| TV                                     | 24  | 7.59% |
| Educational lecture                    | 73  | 23.1% |
| Family/Friends                         | 44  | 13.92% |
| Internet                               | 135 | 42.72% |

Knowledge of Breast cancer

The majority of teachers had adequate knowledge about breast cancer risk factor the most knowledgeable factors were oral contraceptive pills (76.9%), smoking (72.5%) and having the first baby after the age of 30 years (63.9%). On the other hand, early menarche (< 12 years) and late menopause (> 55 years) were recognized as risk factors by only 8.5% and 23.1% of the teachers, respectively. Moreover, majority of the teachers could recognize concerning symptoms and signs of breast cancer, breast mass (92.1%), changes in colour of breast skin (75.6%) and nipple discharge (72.5%). The best time to perform BSE was correctly identified by 61.7% of the respondents (Table 2). The main source of information about breast cancer was the internet (42.7%), followed by educational lectures (23.1%).
Table 2
participants knowledge statements to breast cancer (N = 316)

| Correct Answer | No. | %   |
|----------------|-----|-----|
| Risk factors   |     |     |
| Smoking        | 229 | 72.5% |
| Obese          | 27  | 8.5%  |
| Had first baby after 30 years | 106 | 33.5% |
| Have no children | 106 | 33.5% |
| Age between 50 and 70 years | 73  | 23.1% |
| Early menarche (< 12 years) | 110 | 34.8% |
| Late menopause (> 55 years) | 243 | 76.9% |
| Antibiotics    | 144 | 45.6% |
| Oral contraceptives pills | 140 | 44.3% |
| High dose of vitamins | 130 | 47.5% |
| Hormonal replacement therapy | 133 | 42.1% |
| Calcium therapy | 133 | 42.1% |
| Iron therapy   | 144 | 45.6% |
| Vitamin D      | 229 | 72.5% |
| Symptoms and signs |     |     |
| Breast mass    | 291 | 92.1% |
| Nipple discharge | 229 | 72.5% |
| Nipple ulcer   | 208 | 65.8% |
| Changes in color of breast skin | 132 | 43.7% |
| Breast pain    | 208 | 65.8% |
| The best time to perform BSE | 195 | 61.7% |

The total knowledge score was abnormally distributed, as evidenced by significant Shapiro-Wilk test, p < 0.001. The mean ± SD score was 10.66 ± 3.73 (maximum possible score was 15) and the median (IQR) was 11 (8–13), (Fig. 1).

Table 3 demonstrate a statistically significant association between non-married teachers and low breast cancer knowledge in compare to others, p = 0.047. Other studied factors (age, family and friend history of breast cancer) were not significantly associated with knowledge score.

Table 3
Factors associated with breast cancer knowledge among governmental secondary girls’ schools’ female teachers, in Buraydah city, Saudi Arabia

| Factors                          | Total Breast cancer knowledge score | p-value |
|----------------------------------|-------------------------------------|---------|
|                                  | Median | IQR     | Mean rank |         |
| Age                              |        |         |           |         |
| < 40                             | 11     | 8-13    | 158.47     | 0.995*  |
| 40-50                            | 11     | 8-13    | 158.54     |         |
| Marital status                   |        |         |           |         |
| Single                           | 8      | 5-11.5  | 97.42      | 0.047*  |
| Married/widowed                  | 10     | 8-13.25 | 160.94     |         |
| Family history of breast cancer  |        |         |           |         |
| Yes                              | 11     | 8.75-13 | 166.39     | 0.362   |
| No                               | 11     | 8-13.25 | 155.74     |         |
| Friend history of breast cancer  |        |         |           |         |
| Yes                              | 11     | 8-13    | 160.97     | 0.795*  |
| No                               | 11     | 8-13    | 157.78     |         |

*Significant at p < .05

Attitude practice
The participants’ practice towards breast screening examination are illustrated in Table 4. The majority (57.3%) of the teachers are not performed BSE. Seventy-seven (42.5%) of the teachers reported no actual cause prevent them from doing BSE. On the other hand, half (24.9% and 24.9%) of them reported ignorance and afraid to discover a tumour are other reasons for not performing and 7.7% don’t believe on BSE. In contrast, 42.7% of teachers are performing BSE, and half of them (49.6%) are performed it irregularly.

Table 4
Participant’s Attitude toward breast cancer screening (N = 316)

| Frequency of BSE (n = 135) | No. | %  |
|---------------------------|-----|----|
| Monthly                   | 20  | 14.8% |
| Every 3 months            | 18  | 13.3% |
| Every 6 months            | 14  | 10.4% |
| Every > 6 months          | 16  | 11.9% |
| Irregular                 | 67  | 49.6% |

| Reasons for non-practicing BSE (n = 181) | No. | %  |
|------------------------------------------|-----|----|
| Ignorance                                | 45  | 24.9% |
| Fear to discover tumor                   | 45  | 24.9% |
| Don’t believe in its benefit             | 14  | 7.7%  |
| Don’t know a reason                      | 77  | 42.5% |

| Date of last mammogram                  | No. | %  |
|------------------------------------------|-----|----|
| During this year                         | 25  | 8.0%  |
| Last year                                | 13  | 4.1%  |
| Before two years or more                 | 33  | 10.4% |
| Never                                    | 245 | 77.5% |

| You will perform mammogram in the future? | No. | %  |
|------------------------------------------|-----|----|
| Yes, within the coming month             | 41  | 13.0% |
| Yes, within the coming 6 months          | 53  | 16.8% |
| Yes, within the coming year              | 106 | 33.5% |
| Yes, within the coming 2 years           | 19  | 6.0%  |
| No, I don’t know                          | 91  | 28.8% |

Table 5 illustrate no significant association between the following studied factor and the studied factors including (age, marital status, family and friend history of breast cancer, main source of information and level of breast cancer knowledge) with performing BSE or clinical breast examination. However, older teachers (40–50) reported higher rates of performing mammogram compared to those aged < 40 (29.1% versus 17.1), p = 0.012. Also, teachers who had friends with breast cancer were practiced mammogram at higher rated than their counterparts (25.3% versus 12.70, p = 0.025.
Table 5
Association between socio-demographic data and performing BSE, clinical breast examination.

|                | BSE                       | Clinical BE                   | Mammogram                  |
|----------------|---------------------------|-------------------------------|----------------------------|
|                | No N = 181               | Yes N = 135                  | No N = 286                 | Yes N = 30                | No N = 245                 | Yes N = 71                 | p-value |
| Age            |                           |                               |                            |                           |                            |                            |         |
| < 40 (n = 175) | 86 (45.7)                 | 80 (45.7)                     | 163 (93.1)                 | 12 (6.9)                  | 145 (82.9)                 | 30 (17.1)                  | 0.231   |
| 40-50 (n = 141)| 95 (54.3)                 | 55 (39.0)                     | 123 (87.2)                 | 18 (12.8)                 | 100 (70.9)                 | 41 (29.1)                  | 0.075   |
| Marital status |                           |                               |                            |                           |                            |                            | 0.12    |
| Single (n = 13)| 10 (76.9)                 | 165 (56.9)                    | 12 (92.3)                  | 262 (90.3)                | 11 (84.6)                  | 224 (77.2)                 | 0.948   |
| Married (n = 290)| 7 (46.2)                   | 125 (43.1)                    | 12 (92.3)                  | 28 (9.7)                  | 10 (76.9)                  | 66 (22.8)                  | 0.822   |
| Divorced/widowed (n = 13)| 9 (53.8)              | 3 (23.1)                      | 1 (7.7)                    | 1 (7.7)                   | 9 (7.7)                    | 3 (23.1)                   | 0.015   |
| Family history of breast cancer |           |                               |                            |                           |                            |                            |         |
| Yes (n = 82)   | 30 (48.8)                 | 141 (60.3)                    | 73 (89.0)                  | 213 (91.0)                | 59 (72.0)                  | 48 (20.5)                  | 0.590   |
| No (n = 234)   | 42 (51.2)                 | 93 (39.7)                     | 9 (11.0)                   | 21 (9.0)                  | 186 (79.5)                 | 48 (20.5)                  | 0.159   |
| Friend history of breast cancer |         |                               |                            |                           |                            |                            |         |
| Yes (n = 71)   | 140 (57.1)                | 60 (57.7)                     | 66 (93.0)                  | 220 (89.8)                | 62 (87.3)                  | 62 (25.3)                  | 0.025   |
| No (n = 245)   | 105 (42.9)                | 30 (42.3)                     | 5 (7.0)                    | 25 (10.2)                 | 183 (74.7)                 | 9 (12.7)                   | 0.012   |

The Participant’s barriers toward breast screening are illustrated in Table 5. Most of them strongly agreed with the following statements: fear to discover something abnormal; being busy, don’t know how to arrange to perform it; exposed to more unneeded radiation (22.1%, 20.5%, 13.6%, 13.6%; respectively). Table 6

Table 6
Participant’s barriers toward breast screening (N = 316)

| Strong agreement toward the following statement | No. | %   |
|------------------------------------------------|-----|-----|
| Fear to discover something abnormal             | 70  | 22.1%|
| I don’t know how it will be performed           | 41  | 12.9%|
| I don’t know how to arrange to perform it       | 43  | 13.6%|
| It is shameful for women                        | 30  | 9.4% |
| It needs a long time                            | 28  | 8.8% |
| It is a painful procedure                       | 29  | 9.1% |
| Poor communication with mammography personnel  | 19  | 6%   |
| Women are exposed to more unneeded radiation    | 43  | 13.6%|
| I am busy                                      | 65  | 20.5%|
| Some issues in my life are more important       | 41  | 12.9%|
| I am old and don’t need such scan               | 11  | 3.4% |

Discussion
The purpose of this study was to assess the knowledge, and screening behaviour of female teacher
regarding breast cancer.

The majority of participants in this study have a moderate knowledge of breast cancer risk factors and clinical presentation as the median score (IQR) was 11 (8-13) out of a maximum possible of 15. The good knowledge was observed regarding some risk factors such as oral contraceptive pills, smoking and having the first baby after the age of 30 years. In a study carried out previously in Riyadh, quite similar results were reported. In contrast; another similar study was performed in Buraydah that compared the Knowledge, Attitudes, and Practices of Breast Cancer and Screening in Female Teachers. They concluded the majority (90%) of the participants have a low knowledge score. This represent significant improving the level of knowledge of female teachers. Therefore, our findings could promote the implementation of training programs on breast knowledge. Internationally, an intermediate level of knowledge about risk factors related to breast cancer was observed among majority of female university students in Uganda.

It has been documented that BSE practice makes women more aware of their breasts, which consequently may result in earlier diagnosis of breast cancer. In the present study, 42.7% of the teachers reported performing BSE; among them, it was performed on monthly basis by only 14.8%. In a recent study carried out in Al-Madinah among attendees of primary healthcare centers, the rate of performing BSE was 38.5%. Different rates were reported elsewhere. In Hong Kong (52%), in KSA nursing students (66%), in Jordan (37.5%) and in Uganda (76.5%). The difference in rates between various studies could be attributed to variation in nature of the studied population, the cultural and religious background of the community.

The rate of previous performing of mammogram in the present study was 22.5%, despite mammogram facility is usually provided free to Saudi women. This figure is slightly lower than that has been reported by AlAl-Zalabani AH et al (27.7%). Restricting analysis to teachers ages over 40 years showed rates of 39% and 29.1% for BSE and mammogram, respectively. In a study carried out Riyadh region among women attended primary health centers, BSE and mammogram
performance were reported by 23.1% and 14.8% of them, respectively. The same low rate of mammogram performance has been observed in another Saudi study carried out in Dammam. Al-Wassia et al (2017) reported that around 40% of the Saudi women ever having a mammogram. Ahmed et al (2015) reported that 13% of the Saudi females have performed mammography. El Bcheraoui and colleagues (2015) reported that 92% of Saudi women aged 50 years or older never having a mammogram. Therefore, routine mammography screening is not always possible in developing countries, including Saudi Arabia. Thus, an emphasis should be directed to encourage Saudi women to practice periodic clinical breast examination and BSE. Although a debate still exists concerning the effectiveness of BSE in reducing mortality from breast cancer, it remains an important tool for early detection of breast cancer in many parts of the world.

In the current study, the commonest reported barriers of breast cancer screening were fear to discover something abnormal (50.9%), being busy (49.4%), they don't know how to arrange to perform it (40.8%) and they don't know how it will be performed (37.3%). In a study carried out in Al-Madinah among primary healthcare centers attendees, incorrect beliefs about mammography as being a painful procedure and the exposure of women to more unneeded radiation were the main barriers. However, also, bad communication with mammography personnel and the perception of mammography as being shameful were also important barriers in that study. The difference between results of the two studies is expected due to difference in the characteristics of the target population.

Conclusions

This study indicates that breast cancer knowledge among governmental female secondary school teachers in Buraydah city, Saudi Arabia is overall insufficient, regarding risk factors and clinical presentation. Performance of breast cancer screening techniques is not enough. Therefore, according to this conclusion, improving knowledge regarding breast cancer risk factors, presentation and screening tools as BSE and mammogram through educational programs is highly recommended for prevention and early detection. Primary health care professionals should have a role in conveying correct information regarding breast cancer and its early detection during regular physician office
visits for other health problems. Encouraging practice of BSE through the audio-visual media, lectures and symposia is needed.

Declarations

**Conflict of interest**

The authors have declared no competing interests.

**Authors’ contributions**

Sharifa Khalid Alduraibi was responsible for the conception of the research idea and the study design, data collection, analysis, interpretation, and drafting of the manuscript.

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Figures
Figure 1

Distribution of the total breast cancer knowledge score among governmental secondary girls’ schools’ female teachers, in Buraydah city, Saudi Arabia