# RESEARCH ARTICLE

# Are Women in Kuwait Aware of Breast Cancer and Its Diagnostic Procedures?

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## Abstract

　　The aim of this study was to examine the knowledge and awareness of women in Kuwait with regard to risk factors, symptoms and diagnostic procedures of breast cancer. A total of 521 questionnaires were distributed among women in Kuwait. Results showed that 72% of respondents linked breast cancer factors to family history, while 69.7% scored abnormal breast enlargement as the most detectable symptom of the disease. Some 84% of participants had heard about self-examination, but knowledge about mammograms was limited to 48.6% and only 22.2% were familiar with diagnostic procedures. Some 22.9% of respondents identified the age over 40 years as the reasonable age to start mammogram screening. Risk factor awareness was independent on age groups (p>0.05), but both high education and family history increased the likelihood of postivie answers; the majority knew about a few factors such as aging, pregnancy after age 30, breast feeding for short time, menopause after age of 50, early puberty, and poor personal hygiene. In conclusion, 43.1% of participants had an overall good knowledge of breast cancer with regards to symptoms, risk factors and breast examination. Very highly significant associations (p<0.005) were evident for all groups except for respondents distributed by nationality (p=0.444). Early campaigns for screening the breast should be recommended to eliminate the confusion of wrong perceptions about malignant mammary disease.

**Keywords:** Breast cancer - awareness - signs - symptoms - diagnostic procedures

## Introduction

　　Breast cancer is one of the most common diseases affecting women worldwide and is reported by the World Health Organization (WHO) as one of the leading causes of death (World Health Organization, 2013a). Approximately one million cases of breast cancer are diagnosed every year (World Health Organization, 2013a; b). In the State of Kuwait, and according to the Kuwait cancer registry, figures show that the number of female breast cancer cases has increased five fold from 314 cases in 1980-1989 to 1555 cases registered in 2000-2009 (Elbasmy, 2010). Furthermore, it was identified as the most common cause of cancer-related deaths (n=250) in 2000-2009 (Elbasmy, 2010). Statistics also show that the mean age of breast cancer among Kuwaiti and non-Kuwaiti females was 52 and 47 respectively during these periods (Elbasmy, 2010). Generally speaking, poor education and a lack of knowledge of the risks and symptoms of breast cancer was found to be the main reasons for the late detection of breast cancer (Anderson et al., 2003; Akinola et al., 2011). If breast cancer is detected at an early stage, the patient will improve his diagnosis (Anderson et al., 2008; Montazeri et al., 2008) and will have a higher chance of survival (Guvenc, 2012).

　　Literature shows that the methods most recommended for early detection of breast cancer are mammography, clinical breast examination (CBE) and breast self-examination (BSE) (Akinola et al., 2011; Guvenc, 2012). CBE and BSE are inexpensive and easy to perform; however, they are not efficient enough for early diagnosis of breast cancer (Kearney and Murray 2009). Mammography is a radiologic diagnostic procedure that is used to detect any pathological changes in the breast and is highly recommended for an accurate diagnosis of breast cancer (Akinola et al., 2011; Radi, 2013).

　　In order to prevent breast cancer, women have to be familiar with the risk factors and the first signs of breast cancer (Akinola et al., 2011; World Health Organization, 2013a). For example, women should be aware of the factors that may increase the possibility of developing breast cancer, such as family history, age, hormone therapy, excessive radiation exposure and benign breast tumor. In addition, women should have knowledge about different diagnostic examinations that are necessary for proper and accurate diagnosis of breast cancer.

　　The awareness level of breast cancer and knowledge of its diagnostic procedures has been well investigated in different regions of the world (Alam, 2006; Montazeri et al., 2008; Akinola et al., 2011; Radi, 2013; Hussein, 2013; Mahfouz et al., 2013). Overall, a lack of knowledge and awareness was noticed among the groups of people tested

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in regard to risk factors, symptoms and the diagnostic procedures of breast cancer.

Based on such statistics, the authors believe that if the public had better awareness of breast cancer earlier in life, death rates would be minimized. Therefore, we aimed in this study to assess women's awareness levels and knowledge in the state of Kuwait regarding the risk factors, symptoms and diagnostic procedures of breast cancer.

## Materials and Methods

This was a descriptive and cross-sectional study conducted from January to May 2013 among women living in Kuwait. They were approached in several places, including shopping malls, hospitals, schools and companies. Data was collected using a self-administrated questionnaire, which was based on information drawn from the literature and developed by the authors (RS, LA). A total of 521 questionnaires were distributed, and 519 were completed, giving a response rate of 99.6%. The inclusion criteria for the females were age 20 and above, nationality, education, employment, and marital status. The purpose of the study was explained and provided to the participants, who were informed that their confidentiality would be maintained. The questionnaire had 51 items and was designed to test knowledge of the following three themes; breast cancer risk factors, breast cancer symptoms, and knowledge of the diagnostic imaging procedures. Specific items for each theme are presented in Table 1. Ethical approval for the study was waived by the institutional ethics committee.

Data analysis was performed using SPSS version 17.0 (SPSS Inc., Chicago, III, USA). T-test and ANOVA were used for normally distributed data and equal variance distribution to compare means between demographic variables where they were split up into two groups (samples) or more. Otherwise, Mann-Whitney U-statistics and the Kruskal-Wallis (K-W) test for more than two independent samples were used for non-normally distributed data. The level of females' knowledge or satisfaction on various questions was evaluated on the basis of "mean range", "mean rank", and "p value".

## Results

To ensure the reliability of the selected lists of questions, the questionnaire was analyzed by Cronbach's Alpha ($\alpha$) to show the correlation by $\alpha$ estimates that exist between questions in each theme, where $\alpha1=0.672$, $\alpha2=0.772$, $\alpha3=0.651$, corresponding to theme 1, theme 2, and theme 3, respectively.

Descriptive data is shown in table (1), which includes the frequency and percentage of responses for each question in the themes. It was found that almost 72 percent of respondents linked breast cancer factors to family history. Other responses greater than 50% were hormone therapy (53.2%), x-ray repetition rate (56.6%), smoking (63%), and benign breast tumor (56.3%). The rest of the risk factor responses were less than 50%, for example: age dependence (38%), underwire effects (37.6%), alcohol (49.1%), obesity (30.3%), delivery after the age of 30

(13.7%), shorter duration of breast feeding (28.9%), menopause after the age of 50 (29.8%), contraceptive pills (33.3%), and personal hygiene (25.7%). The factor least associated with breast cancer was menarche before age 11 (7.3%). Most of the symptoms that related to breast cancer were abnormal breast enlargement (69.7%), enlargement in the armpit (66.9%), discoloration and texture (66.9%), neighboring nodes (63.8%), pain in the breast (58%), nipple discharge (47.6%), nipple retraction (38.7%), itchiness and discoloration of the nipple (47.4%), and asymmetrical breasts (44.9%).

Most of the participants had heard about self-examination (84.8%), and they have knowledge of how to perform it (53.4%) and the importance of monthly self-examination (49.1%), especially self-examination at age 20 (25.6%). With regard to mammography, the majority did not have mammogram in the past (83.8%) and 48.6% heard about mammogram. 34.5% knew about the health benefit of annual mammogram and the participants who were familiar with mammogram procedures and its preparation scored 22.2% and 17.9% respectively. 39.5% found mammogram a necessary procedure and painful exam in 30.8%. Mammogram was considered as an early and best tool in 58.8% and 36.2% respectively, with a knowledge of side-effects in 9.4% of participants and raised concerns to be examined by x-ray in 59.9%.

The majority of the respondents (41.6%) identified the age of 31-40 years as reasonable to start mammogram screening, whereas the age of 20-30 years and over 40 years were identified by (31.2%) and (22.9%), respectively. Most of the respondents (>50%) in our study unaware and lack the knowledge of which is the best modality that can be used for either screening of asymptomatic women or routine examination for symptomatic women.

Table (2) show descriptive and statistical inference (p value) for the responses for age, nationality, education, occupation, marital status, family history, family breast cancer cases, and the responses of participants that hear about breast cancer. Here the total responses were combined for each theme to provide a general conclusion. 71.8% had difficulty in selecting the best imaging modality. It was shown that there was no significant (p>0.05) response between groups in selecting the best imaging modalities for breast exams. Additionally, table (2) shows the association between all the socio-demographic factors and public information about breast cancer knowledge. There was a highly significant association between age, occupation, marital status, family history of various cancers incidence, and hearing about breast cancer, and knowledge of the breast cancer exams (p<0.005). It was found that participants above 50 yrs. have mean=1.37±0.033 compared to other age groups. And the association with housewives (table 3D) has a mean=1.21±0.027 higher than s tudents and the employed. The highest mean for others (not singles or married) was 1.22±0.036. The group that had a greater incidence of other cancers (m=1.18±0.015) and breast cancer (m=1.2±0.019) showed a greater knowledge about breast cancer (p<0.0005).

Another breast cancer public information concern is the age at which to perform a mammogram. All age groups

*Awareness of Breast Cancer Risk Factors and Diagnostic Procedures among Women in Kuwait*

**Table 1. Descriptive Statistics**

| Theme 1: Are the following considered as risk factors of breast cancer? | No | % | Don't know | % | Yes | % |
|---|---|---|---|---|---|---|
| Q1. Family history | 47 | 9.1 | 95 | 18.3 | 377 | 72.6 |
| Q2. Ageing | 167 | 32.2 | 155 | 29.2 | 197 | 38.0 |
| Q3. Underwire effect of bra | 140 | 27.0 | 184 | 35.5 | 195 | 37.6 |
| Q4. Hormone therapy | 38 | 7.3 | 205 | 39.5 | 276 | 53.2 |
| Q5. multiple radiation exposure | 33 | 6.4 | 192 | 37 | 294 | 56.6 |
| Q6. Smoking | 69 | 13.3 | 123 | 23.7 | 327 | 63.0 |
| Q7. Alcohol | 85 | 16.4 | 179 | 34.5 | 254 | 48.9 |
| Q8. Obesity | 134 | 25.8 | 228 | 43.9 | 157 | 30.3 |
| Q9. Pregnancy after age of 30 | 200 | 38.5 | 248 | 47.8 | 71 | 13.7 |
| Q10. Breast feeding for a short time | 158 | 30.4 | 211 | 40.7 | 150 | 28.9 |
| Q11. Menopause after age of 50 | 126 | 24.3 | 238 | 45.9 | 155 | 29.9 |
| Q12. Puberty before age of 11 | 63 | 31.1 | 285 | 54.9 | 38 | 7.3 |
| Q13. Contraceptive pills | 109 | 21 | 237 | 45.7 | 173 | 33.3 |
| Q14. Benign breast tumor | 58 | 11.2 | 169 | 32.6 | 292 | 56.3 |
| Q15. Personal hygiene | 201 | 38.7 | 185 | 35.6 | 133 | 25.6 |
| Theme 2: Are the following considered as symptoms of breast cancer? | No | % | Don't know | % | Yes | % |
| Q16. Discharge from nipple | 59 | 11.4 | 213 | 41 | 247 | 47.6 |
| Q17. Lump in breast | 30 | 5.8 | 158 | 30.4 | 331 | 63.8 |
| Q18. Pain in breast | 92 | 17.7 | 126 | 24.3 | 301 | 58.0 |
| Q19. Change in color and texture of breast | 34 | 6.6 | 138 | 26.6 | 347 | 66.9 |
| Q20. Abnormal breast enlargement | 33 | 6.4 | 123 | 23.7 | 362 | 69.7 |
| Q21. Nipple retraction | 48 | 9.2 | 270 | 52 | 201 | 38.7 |
| Q22. Swelling In armpit | 32 | 27 | 140 | 27 | 347 | 66.9 |
| Q23. Itchiness or discoloration of nipple | 146 | 12.9 | 206 | 39.7 | 146 | 47.4 |
| Q24. Asymmetric breast size | 111 | 21.4 | 175 | 33.7 | 233 | 44.9 |
| Theme 3: A-Knowledge of breast cancer diagnostic procedures | No | % | Don't know | % | Yes | % |
| Q25. Have you heard of breast self-exam (BSE)? | 33 | 6.4 | 46 | 8.9 | 440 | 84.8 |
| Q26. Do you know how to do it? | 133 | 25.6 | 109 | 21 | 277 | 53.4 |
| Q27. Has it ever been explained for you? | 230 | 44.3 | 103 | 19.8 | 186 | 35.8 |
| Q28. Do you know that it should be done monthly? | 86 | 16.6 | 177 | 34.1 | 255 | 49.1 |
| Q29. Do you know that it should be done at age of 20? | 196 | 37.8 | 190 | 36.6 | 133 | 25.6 |
| Q30. Have you heard of mammogram? | 165 | 31.8 | 102 | 19.7 | 252 | 48.6 |
| Q31. Have you ever had mammogram? | 373 | 71.9 | 62 | 11.9 | 84 | 16.2 |
| Q32. Do you think mammogram should be done yearly? | 80 | 15.4 | 260 | 50.1 | 179 | 34.5 |
| Q33. Are you aware of mammogram procedures? | 252 | 48.6 | 152 | 29.3 | 115 | 22.2 |
| Q34. Are you aware of mammogram preparations ? | 281 | 54.1 | 145 | 27.9 | 93 | 17.9 |
| Q35. Is it necessary to be done only if you have breast pain? | 180 | 34.7 | 134 | 25.8 | 205 | 39.5 |
| Q36. Do you think it is a painful procedure? | 113 | 21.8 | 246 | 47.4 | 160 | 30.8 |
| Q37. Do you think it helps in the early diagnosis of breast cancer? | 16 | 3.1 | 198 | 38.2 | 305 | 58.8 |
| Q38. Do you think it is the accurate procedure for the diagnosis of breast cancer? | 51 | 9.8 | 280 | 53.9 | 188 | 36.2 |
| Q39. Does it have future side effects? | 110 | 21.2 | 360 | 69.4 | 49 | 9.4 |
| Q40. Would you hesitate to do this procedure because of fear and embracement? | 108 | 20.8 | 100 | 19.3 | 311 | 59.9 |
| B-Q41. At what age this procedure is advised to be done? | 20-30 | % | 31-40 | % | 40+ | % |
| | 162 | 31.2 | 216 | 41.6 | 119 | 22.9 |
| C- Q42. which of the following imaging procedures is effective in diagnosis of breast cancer? | | | | | | |
| 43. MRI | 346 | 66.7 | 0 | 0 | 173 | 33.3 |
| 44. US | 392 | 75.5 | 0 | 0 | 127 | 24.5 |
| 45. NM | 412 | 79.4 | 0 | 0 | 106 | 20.4 |
| 46. CT | 392 | 75.5 | 0 | 0 | 127 | 24.5 |
| 47. Don't know | 320 | 61.7 | 0 | 0 | 198 | 38.2 |

(table 2) showed the mean score close to 1 suggesting that the all participants did agree that the responses to perform mammogram is at ages between 31-40 years; the majority of responses is given to age group over 50 years (p=0.06), to Kuwaiti (p=0.024), and to house-wives (p=0.034). 50 (37%) participants of age 40+ years agree to perform mammogram at age 40+ years relative to others 84 (63%); 90 (30%) selected the age 40+ to perform mammogram, where other 210 (70%) Kuwaiti selected ages under 40 years. Employed responses for ages above 40 is scoring 102 (26%), whereas for ages at 40 and below the score is 290 (74%) (m=0.98±0.042). For other splits of groups (Tables 3C, 3E, 3F, 3G, 3H), the selection of question "what age category is best to perform a mammogram" showed no significant difference in participants' responses (p>0.05).

Although both groups (Undergraduate and Graduate) had poor knowledge about the risk factors, the graduate students (table 2) had higher knowledge about risk factors (p<0.005) in comparison to UG. The knowledge of risk factors was associated (p<0.005) with a family history of cancer (mean=1.22±0.015), a family history of breast cancer incidence (m=1.19±0.018), and those who had heard about breast cancer (m=1.18±0.009).

The knowledge of symptoms and signs of breast cancer (table 2) was significantly associated with age group above 50 "m=1.52±0.038", graduate "m=1.49±0.01", employed "m=1.48±0.011", married "m=1.48±0.012", family history of cancer "m=1.51±0.017", family breast cancer history "m=1.5±0.021", and the group who had

**Table 2. Descriptive and Statistical Inference for the Responses Over Demographic Variables**

| | N (%) | P | N (%) | N (%) | N (%) | N (%) | P1 | P2 | P (3A) | P (3B) | P (3C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Themes (1, 2, 3A) Age Groups | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | 20-30 | 31-40 | 41-50 | 50+ | 0.422 | 0..002** | 0.000*** | 0.026* | 0.732 |
| 0. No | 22.5 | | 23.2 | 22.4 | 20.8 | 23 | | | | | |
| 1. Don't Know | 34.4 | | 39 | 33.3 | 30.5 | 22.3 | | | | | |
| 2. Yes | 43.1 | | 37.8 | (44.2 | 48.7 | 54.6 | | | | | |
| | Mean= | | 1.15 | 1.22 | 1.28 | 1.32 | | | | | |
| | Se= | | 0.01 | 0.01 | 0.013 | 0.021 | | | | | |
| Themes (1, 2, 3A)  Nationality | | | | | | | | | | | |
| Q1 To Q40 | | 0.444 | K | Nk | | | 0.586 | 0.261 | 0.376 | 0.024* | 0.232 |
| 0. No | 22.5 | | 21.9 | 23.3 | | | | | | | |
| 1. Don't Know | 34.4 | | 35.8 | 32.6 | | | | | | | |
| 2. Yes | 43.1 | | 42.3 | 44.1 | | | | | | | |
| | Mean= | | 1.2 | 1.21 | | | | | | | |
| | Se= | | 0.01 | 0.008 | | | | | | | |
| Themes (1, 2, 3A) Education | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | Ug | G | | | 0.002** | 0.000*** | 0.61 | 0.47 | 0.58 |
| 0. No | 22.5 | | 27.7 | 21.6 | | | | | | | |
| 1. Don't Know | 34.4 | | 31.5 | 35 | | | | | | | |
| 2. Yes | 43.1 | | 40.8 | 43.5 | | | | | | | |
| | Mean= | | 1.13 | 1.22 | | | | | | | |
| | Se= | | 0.01 | 0.006 | | | | | | | |
| Themes (1, 2, 3A) Ocupation | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | House-Wife | Employed | Student | | 0.785 | 0.000*** | 0.000*** | 0.034* | 0.69 |
| 0. No | 22.5 | | 24 | 21.8 | 25.2 | | | | | | |
| 1. Don't Know | 34.4 | | 26.7 | 34.8 | 38.9 | | | | | | |
| 2. Yes | 43.1 | | 49.3 | 43.3 | 35.9 | | | | | | |
| | Mean= | | 1.25 | 1.22 | 1.11 | | | | | | |
| | Se= | | 0.02 | 0.006 | 0.015 | | | | | | |
| Themes (1, 2, 3A) Marital Status | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | Single | Married | Others | | 0.173 | 0.000*** | 0.000*** | 0.249 | 0.474 |
| 0. No | 22.5 | | 21.8 | 22.7 | 23.3 | | | | | | |
| 1. Don't Know | 34.4 | | -39.8 | 32.9 | 27.5 | | | | | | |
| 2. Yes | 43.1 | | 38.4 | 44.4 | 49.2 | | | | | | |
| | Mean= | | 1.17 | 1.22 | 1.26 | | | | | | |
| | Se= | | 0.01 | 0.007 | 0.022 | | | | | | |
| Themes (1, 2, 3A) Family Cancer Perception | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | No | Don't Know | Yes | | 0.000*** | 0.000*** | 0.000*** | 0.887 | 0.229 |
| 0. No | 22.5 | | 24.2 | 17.4 | 21.2 | | | | | | |
| 1. Don't Know | 34.4 | | 34.9 | 46.5 | 30.8 | | | | | | |
| 2. Yes | 43.1 | | 40.9 | 36.1 | 48 | | | | | | |
| | Mean= | | 1.17 | 1.19 | 1.27 | | | | | | |
| | Se= | | 0.01 | 0.016 | 0.009 | | | | | | |
| Themes (1, 2, 3A) Family Breast Cancer Perception | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | No | Don't Know | Yes | | 0.005** | 0.000*** | 0.000*** | 0.432 | 0.328 |
| 0. No | 22.5 | | 23.3 | 17.7 | 22.4 | | | | | | |
| 1. Don't Know | 34.4 | | 34.8 | 46.1 | 28.8 | | | | | | |
| 2. Yes | 43.1 | | 41.9 | 36.3 | 48.8 | | | | | | |
| | Mean= | | 1.19 | 1.19 | 1.26 | | | | | | |
| | Se= | | 0.01 | 0.016 | 0.011 | | | | | | |
| Themes (1, 2, 3A) Hearing About Breast Cancer | | | | | | | | | | | |
| Q1 To Q40 | | 0.000*** | No | Don't Know | Yes | | 0.001 | 0.000*** | 0.002** | 0.502 | 0.225 |
| 0. No | 22.5 | | 21 | 22.8 | 22.6 | | | | | | |
| 1. Don't Know | 34.4 | | 35.7 | 61.5 | 33.8 | | | | | | |
| 2. Yes | 43.1 | | 43.2 | 15.8 | 43.6 | | | | | | |
| | Mean= | | 1.22 | 0.93 | 1.21 | | | | | | |
| | Se= | | 0.03 | 0.031 | 0.006 | | | | | | |

NS:Not Significant p>0.05; *S:Significant p≤0.05; **HS:Highly Significant p≤0.005; ***VHS:Very Highly Significant p≤0.0005

heard about breast cancer "m=1.46±0.01".

Table (2) also shows the overall descriptive (n%, P). Almost 43.1% of participants are aware of breast cancer in various themes, though a few response items are relatively low. It also shows a very highly significant association (p≤0.0005) with all demographic variables groups except for respondents distributed by nationality (p=0.444). The highest responses were at age 50+ "m=1.32±0.021", graduated "m=1.22±0.006", house-wives "m=1.25±0.017", not single status "m=1.26±0.022", and had family history "m=1.27±0.009".

## Discussion

Awareness levels of breast cancer among women worldwide are well documented in the literature. Therefore, we aimed in this study to measure the awareness and knowledge levels of women living in the state of Kuwait on breast cancer, risk factors, symptoms and different screening modalities. 95.2% of all participants had heard about breast cancer, which reflects that their responses are not based on random answers, but based on their knowledge and experiences with their family diseases.

Such results were higher than the Malaysian study of 81.2% (Al-Dubai et al., 2011).

*Breast cancer risk factor*

According to documents issued by the American Cancer Society (ACS) and other literature, family history of breast cancer (especially first degree relatives) is one of the reported causes of cancer (Chalmers et al., 2003; American Cancer Society, 2013) and our results showed that 72.6% of the respondents ranked 'a family history of breast cancer' as the highest risk factor in comparison to others. Such a result was lower than the one obtained from Malaysia (88%) (Al-Dubai et al., 2011) and higher than other studies carried out among school teachers (54.2%) (Alharbi et al., 2012) and in different regions of Saudi Arabia; Jeddah (57.5%) (Radi, 2013), Riyadh (39.1%) (Alam, 2006) and Hael (12.1%) (Hussein, 2013). Our results were in agreement with studies from other regions; Tunisia (72.6%) (El Mhamdi et al., 2013) and Abha in Saudi Arabia (74.4%) (Mahfouz et al., 2013). In Kuwait, it has always been believed that marriage with a first degree relative would increase the chance of the disease occurring.

Although ACS has documented the consideration of other risk factors along with family history, in this study, more than 50% of respondents agreed that the following risk factors come next to family history; breast tumors, hormone therapy, repetition of x-ray and smoking. The latter being documented by ACS that current smokers had a 12% higher risk of breast cancer than women who never smoked. Here, other studies are in agreement with our results; Bahrain 68.7% (Fikree and Hamadeh, 2011) and Abha in Saudi Arabia 68.5% (Mahfouz et al., 2013). On the other hand, age dependence, contraceptive pills and underwire effects were scored 38%, 33.3% and 37.6%, respectively. Such results were almost in agreement with the Malaysian study (Al-Dubai et al., 2011); 35.6%, 44% and 34.3%, respectively.

Although breast feeding in short periods was ranked lower here (28.9%), it was higher in the Malaysian study (38%) (Al-Dubai et al., 2011) and for Kuwait school teachers (78.6 %) (Alharbi et al., 2012). This might be due to the fact that school has an environment that culturally encourages women to breast feed and facilitates the time for breast feeding. It was noticed that breast feeding was considered one of the leading factors for breast cancer if women did not breast feed for at least a year (American Cancer Society, 2013). In this modern life, women in Kuwait, in a similar manner to those around the world, would like to maintain a figure free of stretch marks that might result from breast feeding, and since the majority are working women, the possibility to find a suitable time to feed the baby may be challenging. Therefore, attention should be drawn to the benefits of breast feeding and it should be encouraged among women.

Kuwait is ranked as having the second highest rate of obesity among its population. More than 70% of respondents in our study and in a previous Kuwaiti study (Alharbi et al., 2012) did not rank this factor highly. Thus, their attention must be drawn to this significant contributing factor to breast cancer.

*Breast cancer symptoms*

Breast cancer symptoms were clearly explained in the literature. Respondents in our study ranked a variety of breast cancer symptoms differently. Abnormal breast enlargement was ranked high (69.7%) among other symptoms. This is in agreement to other studies; Kuwait 73.9% (Alharbi et al., 2012), UK >90% (McCaffery et al., 2003) and Malaysia 90.8% (Al-Dubai et al., 2011). Other symptoms include change in color and texture (66.9%), enlargement in the armpit (66.9%), and node in the breast (63.8%). Similar results were obtained from southwestern Saudi Arabia, where respondents ranked changes in size and shape of the breast from 59% to 66.8% (Mahfouz et al., 2013). This is justified in that such symptoms are straightforward to physically self-identify.

Although ACS has labeled nipple discharge as one of the clear signs of breast cancer, it was ranked lower than other factors at 47.6% and 39.7% for nipple retraction and discharge, respectively. These findings were in agreement with other studies (El Mhamdi et al., 2013; Radi, 2013). However this was higher than an Iranian group who scored only 6% and 5% for nipple discharge and nipple retraction, respectively (Montazeri et al., 2008). Here, respondents may consider such symptoms as a temporary occurrence that might cease shortly thereafter. Therefore, they rely on past experiences of friends and family.

*Mammography and BSE*

Mammography is one of the diagnostic imaging tools used in radiology (along with other imaging modalities) to diagnose any mass or abnormalities within breast tissue. Breast cancer can be detected using such modality (World Health Organization, 2013a). In comparison to other regions, Tunisia (35.4%) (El Mhamdi et al., 2013), Nigeria (40.5%) (Akinola et al., 2011) and Abha in Saudi Arabia (22.8%) (Mahfouz et al., 2013), our study shows that 58.8% of respondents agree that mammogram should be an early diagnostic tool used to diagnose breast tissue abnormalities. However, only 9.4% were aware of its side effects and 34.5% considered it as a yearly procedure. Here, it is clear that their knowledge level is low and that they have many concerns to answer (59.9%). This is very clear when it comes to their awareness of the suitable age to maintain mammogram adherence. Although ACS have documented and recommend the best age to maintain yearly mammogram screenings from the age of 40, only (22.9%) of respondents are in agreement on this. Literature has shown that physicians can greatly influence requests for mammography screenings and can increase patients' awareness of its various aspects (Amin et al., 2009). Despite more than 50% (58.8%) of respondents stating that mammogram is a tool for early detection of breast cancer, they still have serious concerns (59.9%) about being examined by x-ray due to the fact that risks might be associated with x-ray, and that a painful compression device is used during the mammography procedure. Additionally, individuals may suffer from embarrassment, anxiety and fear over the examination.

It was also noted that participants age 50 and above are more knowledgeable about breast cancer with regards to the risk factors, symptoms and the best age to perform

mammogram. This might be due to the fact that this group is experiencing menopause and thus they are more concerned about breast changes or general changes in their bodies with the possibility of multiple visits to clinics and increased contact with clinical staff. This is in contrast to a study conducted in Turkey that found that younger groups were more knowledgeable (Guvenc et al., 2012). Here, we are in agreement with a UK study on old people (Linsell et al., 2008).

The authors would like younger women to be more knowledgeable about breast cancer since the average age at presentation of breast cancer in Arab countries is 48 (Najjar and Easson,2010), which means that better understanding at an earlier age might contribute to avoiding future complications and enable better management, including increased awareness of the ideal age at which to begin screening.

Many younger age women have a busy life and are fully engaged raising children, which makes BSE or frequent visits to their family general practitioner a low priority. Our study included younger women, who have a relatively low rate of mammography screening. It appears that if a mammography had not been recommended by clinical staff, then participants would not have requested a screening.

BSE is recommended by WHO as a procedure to raise awareness of signs rather than as a screening method. It was documented by ACS that BSE is an option for women starting in their 20s. Here, women should be told about the benefits and limitations of BSE, and they should report any breast changes to their family physician. Women should also review their technique regularly while doing BSE to ensure that the maximum benefit from it is obtained and the goal of detecting any changes in the breast tissue is achieved. Although respondents in our study have shown a low degree of knowledge on the age to perform BSE (25.6%), they scored high on their awareness level regarding BSE (> 50%) (Table 1). It was known by most of the respondents in this study as 85% had previously heard about it, which compares to an earlier Kuwaiti study where the rate was 50.1% (Alharbi et al., 2012). This agreed with findings reported from different regions in Saudi Arabia, where 79% of the respondents were aware of the procedure (Alam, 2006; Radi, 2013). Other studies showed less awareness, such as Tunisia (53.4%) (El Mhamdi et al., 2013). Only 36% of the respondents in our study knew the correct procedure for BSE compared to a previous study in Kuwait of 29.0% (Alharbi et al., 2012), while more than half of the respondents (64%) had incorrect or no knowledge of the appropriate procedure.

It was noted that theme 3 showed a lower percentage as respondents lacked knowledge of the diagnostic modalities to be used for asymptomatic women or routine examination for symptomatic women since this knowledge is generally limited to specialists in the field.

Public health campaigns and programs should be launched to educate and train people about BSE and so improve recognition of signs and symptoms of breast cancer and aid understanding of the significance of seeking early medical help. In addition, it is necessary to emphasize Breast awareness program to encourage women to be familiar with own breast and the way they will change throughout her life. Female practitioners must be encouraged to get involved in breast screening tests in an attempt to eliminate the embarrassment that women face if a male practitioner performs the screening test.

Population-based breast screening programs using mammography have reduced breast cancer mortality in Western countries (Bonfill et al., 2009). Therefore, an early campaign for screening might help in early detection. In addition, proper knowledge of symptoms and signs of breast cancer would eliminate confusion of malignant diseases in the breast. Further, educational programs should be organized in different schools for adolescents in order to boost knowledge within this group and so improve awareness of breast cancer as they grow up. Cultural beliefs and attitudes have also influenced the stage at which breast cancer is diagnosed (Wong-Kim et al., 2003; Russell et al., 2007). This is true especially in the Middle East region where exposing parts of the body, specifically the breast, might make women hesitant to take the first step to visit a clinic.

In conclusion, it was found that ≈43.1% of respondents have good overall knowledge of breast cancer with regards to the symptoms, risk factors and breast examinations. In particular women of age 50 and above, graduate participants and those who have experienced family history of cancer have better knowledge of breast cancer issues. Nevertheless, emphasis should be made on the specific risk factors that were not considered by the women, especially age dependence, the effect of underwear, obesity, alcohol, delivery after age 30, shorter duration of breast feeding, use of contraceptive pills, menopause after the age of 50 and menarche at an early age. In this study, knowledge about signs and symptoms of breast cancer was investigated. The majority of respondents knew about several signs and symptoms of breast cancer, such as breast lump and enlargement of neighboring lymph nodes. However, the participants did not recognize other signs and symptoms, such as breast skin retraction, discharge from the nipple, itchiness and discoloration of nipple and asymmetrical breasts. Finally, women in the State of Kuwait show a reasonable awareness level on certain aspects of breast cancer and its diagnostic procedures compared to other developing countries in the region, but more is needed to improve awareness of other aspects of breast cancer.

## References

Akinola R, Wright K, Osunfidiya O, Orogbemi O, Akinola O (2011). Mammography and mammographic screening: are female patients at a teaching hospital in Lagos, Nigeria, aware of these procedures? *Diagn Interv Radiol*, **17**, 125-9.

Alam A (2006). Knowledge of breast cancer and its risk and protective factors among women In Riyadh. *Ann Saudi Med*, **26**, 272-7.

Al-Dubai S, Qureshi A, Saif-Ali R et al (2011). Awareness and knowledge of breast cancer and mammography among a group of Malaysian women in Shah Alam. *Asian Pac J Cancer Prev*, **12**, 2531-8.

Alharbi N, Alshammari M, Almutairi B, Makboul G, El-Shazly M (2012). Knowledge, awareness, and practices concerning

breast cancer among Kuwaiti female school teachers. *AJM*, **48**, 75-82.

American Cancer Society (2013). Breast cancer facts and figures 2013-2014. *American Cancer Society*, Inc.

Amin T, Al Mulhim A, Al Meqihwi A (2009). Breast cancer knowledge, risk factors and screening among adult saudi women in a primary health care setting. *Asian Pac J Cancer Prev*, **10**, 133-8.

Anderson BO, Braun S, Lim S, et al (2003). Early detection of breast cancer in countries with limited sources. *Breast*, **9**, 551-9.

Anderson BO, Yip CH, Smith RA, et al (2008). Guideline implementation for breast healthcare in low-income and middleincome countries: overview of the Breast Health Global Initiative Global Summit 2007. *Cancer*, **113**, 2221-43.

Bonfill X, Marzo M, Pladvall M, Marti J, Emparanza JI (2009). Strategies for increasing the participation of women in community breast screening. *Cochrane Database Syst Rev*, **1**.

Chalmers K, Marles S, Tataryn D, Scott-findly S, Serfas K (2003). Reports of information and support needs of daughters and sisters of women with breast cancer. *EJCC*, **12**, 81-90.

Elbasmy A (2010). Kuwait cancer registry ten years Report: 2000-2009. Kuwait: Kuwait Ministry of Health.

El Mhamdi S, Bouanene L, Mhirsi A, et al (2013). Women's knowledge, attitudes and practice about breast cancer screening in the region of Monastir (Tunisia). *Aust J Prim Health*, **19**, 68-73.

Fikree M, Hamadeh R (2011). Breast cancer knowledge among bahraini women attending primary health care centers. *Bah Med Bull*, **33**, 135-9.

Guvenc I, Guvenc G, Tastan S, Akyuz A (2012). Identifying women's knowledge about risk factors of breast cancer and reasons for having mammography. *Asian Pac J Cancer Prev*, **13**, 4191-7.

Hussein DM, Alorf SH, Al-Sogaih YS etal (2013). Breast cancer awareness and breast self-examination in Northern Saudi Arabia. a preliminary survey. *Saudi Med J*, **34**, 681-8.

Kearney AJ, Murray M (2009). Breast cancer screening recommendations: is mammography the only answer? *J Midwifery Womens Health*, **54**, 393-400.

Linsell L, Burgess CC, Ramirez AJ (2008). Breast cancer awareness among older women. *Br J Cancer*, **99**, 1221-5.

Mahfouz A, Hassanein M, Nahar S, et al (2013). Breast cancer knowledge and related behaviors among women in Abha city, southwestern Saudi Arabia. *JCE*, **28**, 516-520.

McCaffery K, Wardle J, Waller J (2003). Knowledge, attitudes, and behavioral intentions In relation to the early detection of colorectal cancer in the United Kingdom. *Prev Med*, **36**, 525-35.

Montazeri A, Vahdaninia M, Harirchi I, et al (2008) Breast cancer in Iran: need for greater women awareness of warning signs and effective screening methods. *Asia Pac Fam Med*, **7**, 6

Najjar H, Easson A (2010). Age at diagnosis of breast cancer in Arab nations. *IJS*, **8**, 448-452.

Radi S. (2013). Breast cancer awareness among Saudi females in Jeddah. *Asian Pac J Cancer Prev*, **14**, 4307-12.

Russell KM, Monahan P, Wagle A (2007) Champion V. Differences in health and cultural beliefs by stage of mammography screening adoption in African American women. *Cancer*, **109**, 386-95.

World Health Organization (2013a). Breast cancer: Prevention and control. http://www.who.int/cancer/detection/breastcancer/en/.

World Health Organization (2013b). Latest world cancer statistics. http://www.iarc.fr/en/media-centre/pr/2013/pdfs/pr223_E.pdf.

Wong-Kim E, Sun A, DeMattos MC (2003). Assessing cancer beliefs in a Chinese immigrant community. *Cancer Control*, **10**, 22-8.