



THE AGA KHAN UNIVERSITY

eCommons@AKU

---

Department of Surgery

Department of Surgery

---

November 2012

# Knowledge attitude and practices among urban women of Karachi, Pakistan, regarding breast cancer

Zain-ul-Abedeem Sobani  
*Aga Khan University*

Zeb Saeed  
*Aga Khan University*

Hafiza Noor-ul-Ain Baloch

Amina Majeed

Sana Chaudry

*See next page for additional authors*

Follow this and additional works at: [https://ecommons.aku.edu/pakistan\\_fhs\\_mc\\_surg\\_surg](https://ecommons.aku.edu/pakistan_fhs_mc_surg_surg)



Part of the [Surgery Commons](#)

---

## Recommended Citation

Sobani, Z., Saeed, Z., Baloch, H. N., Majeed, A., Chaudry, S., Sheikh, A., Umar, J., Waseem, H., Mirza, M., Qadir, I. (2012). Knowledge attitude and practices among urban women of Karachi, Pakistan, regarding breast cancer. *Journal of Pakistan Medical Association*, 62(11), 1259-1264.

**Available at:** [https://ecommons.aku.edu/pakistan\\_fhs\\_mc\\_surg\\_surg/716](https://ecommons.aku.edu/pakistan_fhs_mc_surg_surg/716)

---

**Authors**

Zain-ul-Abideen Sobani, Zeb Saeed, Hafiza Noor-ul-Ain Baloch, Amina Majeed, Sana Chaudry, Adil Sheikh, Jalal Umar, Hira Waseem, Murtaza Mirza, and Irfan Qadir

## Knowledge attitude and practices among urban women of Karachi, Pakistan, regarding breast cancer

Zain-ul-Abedeem Sobani,<sup>1</sup> Zeb Saeed,<sup>2</sup> Hafiza Noor-ul-Ain Baloch,<sup>3</sup> Amina Majeed,<sup>4</sup> Sana Chaudry,<sup>5</sup> Adil Sheikh,<sup>6</sup> Jalal Umar,<sup>7</sup> Hira Waseem,<sup>8</sup> Murtaza Mirza,<sup>9</sup> Irfan Qadir,<sup>10</sup> Shaista Masood Khan,<sup>11</sup> Masood Kadir<sup>12</sup>  
Students, Medical College,<sup>1-10</sup> Department of Surgery,<sup>11</sup> Department of Community Health Sciences,<sup>12</sup> Aga Khan University, Karachi Pakistan.  
Corresponding Author: Masood Kadir. Email: masood.kadir@aku.edu

### Abstract

**Objective:** To determine the knowledge, attitudes and practices of urban women regarding breast cancer and its available screening modalities.

**Methods:** The cross-sectional, questionnaire-based, descriptive study was conducted in the urban population of Karachi in November 2010. Female attendants (n=373) visiting a tertiary care centre and four of its urban outreach centres during the study period were administered a questionnaire. The answers were then scored with regard to their knowledge. Frequencies and percentages were computed through SPSS 17, and analysis of variance was used to confirm significance.

**Results:** Of the 373 participants with a mean age of 32.4±10.9 years, 293 (78.6%) were married, and 257 (69%) were housewives. The education level was considerably high; with 214 (57.4%) graduates. The mean score for knowledge of risk factors was 2.84 out of a total of 13; which was significantly associated with marital status and income. Age > 40 years, education level, income and employment status were also significantly associated with higher mean screening awareness scores. Nearly 182 (48.8%) had heard about Breast Self Examination and 142 (38%) knew how to perform one. However, only 97 (25.9%) regularly performed such an exam. Almost all 3621 (97%) women wanted more media awareness campaigns regarding the issue.

**Conclusion:** There is a real need for comprehensive health education programmes focusing on breast cancer awareness in Pakistan.

**Keywords:** Breast cancer, KAP, Screening, Awareness, Breast self examination. (JPMA 62: 1259; 2012).

### Introduction

Breast cancer is recognised as the second leading cause of cancer related death worldwide.<sup>1,2</sup> While the incidence of the disease rises across the globe, it is interesting to note that mortality associated with it has been decreasing in high-risk countries.<sup>3</sup> This may be attributed to the increased efforts in promoting early detection and mammographic screening. With regular screening programmes based on routine mammography, breast cancer mortality rates have significantly decreased.<sup>4</sup>

The incidence in developing countries has also been on the rise.<sup>3</sup> It is estimated that one in every nine Pakistani women is likely to suffer from breast cancer, which is the highest incidence rate in Asia.<sup>5,6</sup> The Karachi Cancer Registry in its report stated that breast cancer accounts for nearly 34.6% of all cancer cases in the city, making it the most common cancer in women of the region.<sup>1,6</sup> However, it is not associated with a similar pattern of increased early detection and decreased mortality as is the case in the developed world.

The disease is associated with significant mortality in Pakistan as most cases present at an advanced stage where treatment options are limited.<sup>7</sup> This may in part be attributed to lack of awareness regarding the disease along with a lack of knowledge regarding the risk factors and screening modalities.<sup>8</sup>

A large study conducted on the female population visiting a tertiary health centre in Rawalpindi, Pakistan, found that a large number of the participants had limited knowledge and poor practices regarding breast cancer screening.<sup>9</sup> A surprising dearth of knowledge was also noted among allied healthcare professionals in Karachi.<sup>10</sup> It was surprising to note that these allied healthcare professionals, entrusted with patient care and educational duties lack adequate knowledge and may in turn propagate fallacies and myths. This gives undue credence to these pieces of misinformation due to their relative position in the healthcare industry.

Our study aimed at determining the level of awareness regarding the risk factors for breast cancer,

including knowledge, attitudes and practices, regarding breast self-examination and mammography in women of urban Karachi.

## Subjects and Methods

The cross sectional, questionnaire-based study was conducted in Karachi, Pakistan. The study protocol was approved by the Ethical Review Committee (ERC) of the Aga Khan University. Convenience sampling was employed and consenting female attendants between the ages of 18 to 70 years accompanying patients to a major tertiary care centre and four of its associated urban outreach centres in November 2010 were recruited for the study. Although regular screening is recommended in women over the age of 40, recently the American Cancer Society Guidelines for the Early Detection of Cancer has advocated clinical screening for women over the age of 20.<sup>11</sup> Keeping this in mind we decided to include women between the ages of 18 and 70 in our study. Those who could not read or comprehend the questionnaire were excluded, as were those associated with the healthcare industry and those who had breast cancer (treated or active disease).

The sample size was calculated using a confidence level of 95% and a 5% bound-on error and a prevalence of 50%. The required sample size came out to be 380. Assuming a refusal rate of 10%, 418 potential subjects were approached and the target achieved was 373 participants.

A self-administered questionnaire comprising 27 questions was designed. The questionnaires were initially designed in the English language and were then translated into Urdu and back-translated into English for verification purposes. All the questionnaires were administered in Urdu. The investigators pre-tested the questionnaires at the primary site and the issues raised during the pre-testing were addressed.

The questions aimed at assessing the level of awareness, knowledge, attitudes and practices regarding risk factors for breast cancer, breast self exam (BSE) and mammography along with the common sources from which our participants obtained their information.

The questionnaire was scored for the questions addressing knowledge regarding risk factors for breast cancer (13 questions) and awareness about the screening modalities (7 questions). Each correct answer carried a score of +1, while every incorrect answer resulted in a deduction of 0.5 from the cumulative score. The participants also had the option of identifying a lack of knowledge or awareness - 'don't know' - for which no score was awarded or deducted. Hence, the scores ranged between -6.5 and +13 for knowledge regarding risk factors, and -3.5 and +7 for awareness regarding the screening modalities. In both

situations, a negative cumulative score represented the presence of fallacies; a positive score represented the presence of factual knowledge, whereas zero represented an equal prevalence of facts and fallacies or the absence of both.

The data was entered into a pre-designed database by two individuals separately, using Epi Info Version 3.6.1. Both data sets were then checked to detect any errors in data entry and all discrepancies during the process, were settled and rectified using the hard copy of the filled questionnaire.

The data sets were then merged and the data was analysed using SPSS 17. Descriptive statistics were used to look at the spread of data with respect to the age, education level and economic status. Frequencies and percentages were computed for categorical variables. Mean and corresponding 95% confidence interval for continuous variables was computed and analysis of variance (ANOVA) was used to confirm significance of the results. A p-value of <0.05 was taken to be statistically significant.

The top 30% of our study population in terms of knowledge score were also grouped together and labelled collectively as a 'high awareness group' and a multiple logistic regression model was then applied to the data. This was done to highlight the effect of demographic characteristics collectively in predicting the level of awareness regarding breast cancer in our target population and to control for potential confounders in the data. The logistic regression allowed us to look at how high-level awareness of breast cancer, its risk factors and screening modalities is determined by age, education and socio-economic status of a Karachi female.

## Results

Of the 418 respondents approached initially, 373 (89.23%) finally represented the study population. The mean age of the participants was 32.4±10.9 years; 293 (78.6%) were married; and 257 (69%) were housewives. The education level of the sample was considerably high, with 214 (57.4%) graduates having at least 14 years of formal education.

Household income of the population was more spread out due to the involvement of multiple urban outreach centres; 57 (15.2%) had an income less than Rs.14,999; 109 (28.7%) between Rs.15,000-29,999; 101 (26.7%) between Rs.30,000-49,999; 60 (16.1%) between Rs.50,000-99,999; and 50 (13.2%) more than Rs.100,000. (Table-1).

All the subjects were familiar with the term of breast cancer. Regarding the awareness of risk factors, the mean score for the overall knowledge of risk factors was

**Table-1: Socio-demographic characteristic.**

<b>Age - mean ( years)</b>	<b>32.4±10.9</b>
<b>Marital Status</b>	
- Married , n (%)	293(78.6)
- Unmarried, n (%)	71 (19)
- Divorced, n (%)	0 (0)
- Widowed, n (%)	9 (2.4)
<b>Occupation</b>	
- Student, n (%)	57 (15.3)
- Housewife, n (%)	257 (68.9)
- Employed, n (%)	28 (7.5)
- Currently Unemployed, n (%)	3 (0.8)
- Retired, n (%)	1 (0.3)
- Other, n (%)	27 (7.2)
<b>Education status</b>	
- Primary, n (%)	4 (1.1)
- Secondary, n (%)	6 (1.6)
- Matric/O-level, n (%)	36 (9.7)
- Inter/A-level, n (%)	113 (30.3)
- Graduate, n (%)	214 (57.4)
<b>House hold income</b>	
- Less than Rs.15000, n (%)	57 (15.2)
- Rs.15000-29000, n (%)	108 (28.7)
- Rs.30000-49000, n (%)	101 (26.7)
- Rs.50000-99000, n (%)	60 (16.1)
- Greater than Rs.100000, n (%)	50 (13.2)

2.84±2.53 out of a maximum of 13. Positive associations were observed between the level of awareness and education level (P <0.001). A similar trend was noted with the average household income (p=0.01), indicating that women with higher education and income had a

significantly greater level of awareness. Similar trends of were also observed when comparing the break-up score of knowledge (facts and fallacies) with the income and education level (Table-2).

The 'high awareness group' comprising the top 30% of the population had a minimum score of 4.5 and above. A multiple logistic regression was applied to this group and it was observed that education level and income of the subjects were the main statistically significant variables associated with high awareness level (Table-3).

Regarding screening modalities, it was observed that age > 40 (p = 0.011), education level of graduate and above (P= 0.017), income level (P=0.001) and employment status (P=0.004) were associated with higher mean awareness scores.

Data related to subjects in the 'high awareness group' with score 3.5 was processed through the logistic regression model which showed similar results regarding awareness of screening modalities (Table-4)

Analysis of practices relating to BSE and mammography showed that 181 (48.8%) had heard about BSE, 141 (77%) and of them (i.e. 38% of the total study population) knew how to perform one. However, only 97 (25.9%) of the population regularly performed a BSE. This knowledge was disseminated from various sources, including doctors (n=224; 60%), friends (n=42; 11.2%); television (n=34; 9.1%); and the internet (n=31; 8.2%).

Of the sample, 102 (27.2%) had undergone a clinical

**Table-2: Knowledge regarding breast cancer risk factors.**

	Mean	Minimum	Maximum
<b>Knowledge regarding facts:</b>			
Score for awareness on Breast Cancer risk factors / 13	2.84±2.53	-3.00	13.00
Score for awareness of facts about Breast Cancer / 5	0.82±1.59	-2.50	5.00
	<b>Correctly identified as true, % (n)</b>	<b>Incorrectly taken as false, % (n)</b>	<b>Didn't know, % (n)</b>
Having a first degrees relative with breast cancer increases your risk	48.3 (180)	22.8 (85)	29.0 (108)
Use of contraceptive pills may cause breast cancer	35.7 (133)	19.0(71)	45.3 (169)
Increased maternal age (more than 30) at the birth of first child is a risk factor for breast cancer	25.2 (94)	25.5 (95)	49.4 (184)
Obesity predisposes to breast cancer	26.3 (98)	30.3 (113)	43.4 (162)
If you began menstruating before the age of 12, you are at increased risk of developing breast cancer	12.6 (47)	35.4 (132)	52.0 (194)
<b>Misconceptions:</b>			
Score for awareness of misconceptions about Breast cancer / 8	2.02±2.17	-2.50	8.00
	<b>Incorrectly taken as true, % (n)</b>	<b>Identified correctly as false, % (n)</b>	<b>Didn't know, % (n)</b>
Using deodorant increases your risk for breast cancer	22.8 (85)	30.8 (115)	46.4 (173)
Smoking and passive smoking can cause breast cancer	49.9 (186)	23.6 (88)	26.5 (99)
Women younger than 40 don't have to worry about developing breast cancer	19.3 (72)	55.0 (205)	25.7 (96)
Wearing excessive black clothing especially black underclothing increases risk for breast cancer	32.7 (122)	27.9 (104)	39.4 (147)
Excessive tea drinking increases your risk	11.3 (42)	46.1 (172)	42.6 (159)
Women without children have a lower chance of developing breast cancer vs. women with children	28.7 (107)	30.8 (115)	40.5 (151)
Breast feeding predisposes to breast	5.4 (20)	82.0 (306)	12.6 (47)
Physical activity has no effect on developing breast cancer	50.4 (188)	16.4 (61)	33.2 (124)

**Table-3: Regression co-efficients and odds ratios (and 95% CIs) for demographic variables associated with high awareness of risk factors and screening modalities regarding breast cancer.**

Variable	P-value	Odds Ratio (95% CI)
<b>Awareness of Risk Factors associated with Breast Cancer</b>		
Age of 40 years and above <sup>1</sup>	0.221	1.397 (0.818,2.386)
Not married women <sup>2</sup>	0.606	1.197 (0.604,2.371)
Having an education level of graduate and above <sup>3</sup>	0.003*	2.144 (1.297,3.542)
Having a positive family history of breast cancer <sup>4</sup>	0.955	1.032 (0.342,3.116)
Having a household income of > Rs.50000 <sup>5</sup>	0.020*	1.757 (1.095,2.821)
Employed/Student <sup>6</sup>	0.229	1.448 (0.792,2.650)
<b>Awareness of screening modalities regarding Breast Cancer</b>		
Age of 40 years and above <sup>1</sup>	.0013*	1.960 (1.154,3.330)
Not married women <sup>2</sup>	0.345	1.386 (0.704,2.730)
Having an education level of graduate and above <sup>3</sup>	0.035*	1.706 (1.037,2.804)
Having a positive family history of breast cancer <sup>4</sup>	0.907	1.067 (0.360, 3.162)
Having a household income of > Rs.50000 <sup>5</sup>	0.050*	1.586 (0.985,2.555)
Employed/Student <sup>6</sup>	0.068	1.758 (0.959,3.220)

(\* indicates statistically significant value)

1: age 40 and above =1; age below 40 = 0

2: Single/Divorced/Widowed = 1; Married women = 0

3: Graduate and above =1; below graduation = 0

4: Having positive family history of breast cancer =1; Negative family history = 0

5: Household income greater than Rs.50, 000 = 1; household income less than Rs.50, 000 = 0

6: Employed or studying =1, unemployed/housewife =0.

breast examination and a highly significant association ( $P < 0.001$ ) was observed between this sub-group of women and the group of women who knew how to perform a BSE.

Only 132 (35.4%) of the women had heard about mammography as a screening tool for breast cancer and 72 (19.2%) identified the appropriate age when mammography should be started in a woman for regular screening. Of the 88 females over the age of 40, only 19 (21.6%) had a mammography done. The sources of knowledge commonly disseminating knowledge identified included television ( $n=100$ ; 27%); and health professionals ( $n=86$ ; 23%).

Though most ( $n=261$ ; 70%) felt that media does play a useful role in creating awareness on the matter, nearly all ( $n=362$ ; 97%) felt that there was room for improvement in terms of propagation of knowledge and awareness with regards to breast cancer, its risk factors and early screening.

We also noted hesitance among females in discussing breast-related issues. It was seen that majority ( $n=262$ ; 70.3%) of the women reported to be comfortable at discussing such issues with their family and close ones, yet when asked who they will talk to first in case of any breast-related problem, nearly half ( $n=180$ ; 48.2 %) said that they would consult their doctor before their relatives; another 124 (33.2%) said that they would turn to their male family members first.

## Discussion

Studies regarding breast cancer awareness and the

BSE have been conducted in different populations. Similar to our findings, other investigators have reported that demographic characteristics such as higher levels of education and income are significant determinants of knowledge of breast cancer risk factors and adherence to BSE practice. Among a cross-section of Nigerian women, a study found that women with higher level of education were significantly more knowledgeable about breast cancer and were 3.6 times more likely to practise BSE.<sup>12</sup>

A study from Iran with social and cultural background similar to Pakistan reported that the percentage of women with good knowledge of breast cancer increased from 0.9% among the illiterate to 33.3% among women with education upto the level of a diploma.<sup>13</sup> In a study conducted in Rawalpindi, only 73% of illiterate women had heard of breast cancer compared to 87.8% of the educated women, while 45.6% of the illiterate and 58.6% of the educated correctly identified lump as a symptom of breast cancer.<sup>14</sup>

The level of awareness regarding breast cancer screening showed a statistically significant association in our study with four parameters; age over 40 years, level of education, household income and employment status. These findings are reflected in studies conducted across various countries. One study conducted in Dammam, Saudi Arabia, demonstrated that education level was statistically associated with awareness; whereas age and family history were not. It did not investigate income levels.<sup>15</sup> Another

study conducted in Jeddah, Saudi Arabia, showed that higher age was associated with a greater level of awareness.<sup>16</sup>

Similarly, in Sri Lanka, a study examined the level of awareness of patients presenting with breast problems and observed a lower level of education to be associated with the least informed patients.<sup>17</sup> In a study conducted in Malaysia, age, education level, and lower perceived socio-economic class were all indicators of poor knowledge of breast cancer and infrequent attendance of screening programmes as well as decreased frequency of performing BSE.<sup>18</sup> Even in our study, the educated group had a higher mean score ( $2.5 \pm 1.67$ ) along with the high income group ( $3.30 \pm 1.57$ ) when compared to the overall score of  $2.36 \pm 1.64$ .

Knowledge without its application is of no use. In our study, 48% of the population had heard about BSE, and nearly 38% of our total study population knew how to perform a BSE. However, the percentage of women regularly performing BSE was found to be 25.9%. The results showed that those women who had clinical breast examination (CBE) once in their life were more likely to be aware of the term 'breast self-exam' and know how to perform it. The association of CBE with knowledge regarding the BSE was found to be very significant.

Studies conducted in selected populations of the developed countries yielded figures comparable with ours. A study carried out on Vietnamese women in Texas, US, showed that 55% of the respondents regularly performed a BSE, and 45% of patients received a CBE.<sup>19</sup> Another study focusing on Chinese immigrant women in the US showed that 80.9% of the participants had heard about BSE, but only 53.9% practised it. Regular BSE was also associated with higher income and a younger age.<sup>20</sup>

When considering the developing world, conflicting reports are presented. A study conducted on female undergraduate students in Nigeria found that 87.7% of the respondents had heard of BSE. However, only 19.0% of them were performing this examination monthly. The study also quoted CBE prevalence of around 9.1% in the preceding year.<sup>21</sup> However, another study from Nigeria carried out in a community setting showed that 43.2% of women were performing a BSE. However, only 9.1% had undergone a CBE.<sup>12</sup> If we consider the case of Nigeria, a comparatively smaller portion of women had heard about BSE in our setting. However, a greater proportion of them were performing the BSE.

In a study done in a tertiary care hospital in Lahore, Pakistan, 36.9% of the participants regularly performed the BSE. The major reason for not performing a BSE identified by the participants was a lack of knowledge

regarding the BSE.<sup>22</sup> In the same study, only 6.9% participants had a CBE which was very low compared to the 28% of our study. However, knowledge and practice of BSE was lower in our study.

It was of interest to note that although the knowledge and practice of BSE was lower in our setting compared to other studies, but the practice of undergoing CBE was comparatively higher, which was, in turn, associated with a higher level of awareness regarding the BSE and an increased practice of doing so.

While looking into the factors influencing the knowledge, attitudes and practices, we decided to look at the impact of media in creating awareness about the risk factors and BSE in our setting. For this purpose we included six questions inquiring about subjects' perceptions on the role of media in making them aware about the risk factors and BSE in our questionnaire.

Although media campaigns for breast cancer awareness are functioning in the developed world, cultural barriers in Muslim countries prevent this issue from being discussed openly. Having said that, it seems quite contradictory to report that 27% of our study population claimed to have received information about breast cancer and its risk factors from the television. This was the highest score compared to that of all the other sources such as the physician, family, friends, internet etc. The result is very convincing as for a population with the majority receiving low level of education, TV seems to be the most effective and commonly available source of knowledge. Adding to this, 69.5% felt that media has played a good role in breast cancer awareness, while 96.8% still felt that this role is insufficient and needs to be re-defined and well-targeted, indicating the need to develop culturally-sensitive breast cancer campaigns in the media. Successful efforts have been made to create awareness in Middle Eastern countries with similar cultural and religious values. Excellent examples of this include the introduction of 'Pink Hijab Day' and the establishment of US Middle Eastern partnership for breast cancer awareness in 2007.

Our country seems to be way behind in such campaigns, but, given the low literacy rate, mass media, especially television, is a great tool and its potential to make a difference need to be recognised and taken advantage of with well-targeted and culturally-sensitive media campaigns.

Our study did have its limitations as it was carried out on a segment of the population visiting hospitals and outreach centres of a specific healthcare system which may be frequented by a specific subset of the overall population. The participants demonstrated some degree of health-seeking behaviour by coming to the centres. This health-

seeking behaviour may have led them to gather information actively from the available sources. Some element of chance may also be present as the participants could have easily guessed the correct answer without having definitive knowledge behind their choice.

### Conclusion

The study showed that the urban women of Karachi did not possess adequate level of awareness regarding breast cancer. There was widespread prevalence of fallacies and misconceptions. All of this information underscores the need for effective health education programmes directed towards spreading awareness regarding the risk factors and screening modalities of breast cancer, leading to the eradication of common myths and cultural taboos associated with the disease.

### References

1. Heidari Z, Mahmoudzadeh-Sagheb HR, Sakhavar N. Breast cancer screening knowledge and practice among women in southeast of Iran. *Acta Medica Iranica* 2008; 46: 321-8.
2. US Cancer Statistics Working Group. United States Cancer Statistics 1999-2007. Incidence and Mortality web-based Report. Atlanta (GA). Department of Health and Human Services. Centers for Disease Control and Preventions and National Cancer Institute: 2010 (Online) (Cited 2012 April 22). Available from URL: <http://www.cdc.gov/uscs>.
3. Parkin DM, Fernández LM. Use of statistics to assess the global burden of breast cancer. *Breast J* 2006; 12: S70-80.
4. Kullmann T, Misset JL. [Evaluating the benefits of mammographic breast cancer screening.]. *Orv Hetil* 2010; 151: 1409-14.
5. Sohail S, Alam SN. Breast cancer in pakistan - awareness and early detection. *J Coll Physicians Surg Pak* 2007; 17: 711-2.
6. Bhurgri Y, Bhurgri A, Hassan SH, Zaidi SH, Rahim A, Sankaranarayanan R, et al. Cancer incidence in Karachi, Pakistan: first results from Karachi Cancer Registry. *Int J Cancer* 2000; 85: 325-9.
7. Rashid M, Rafi CM, Mamoon N. Late presentation of carcinoma breast in Pakistani women. . *Pak Armed Forces Med J* 1996; 46: 11-5.
8. Malik IA. Clinico-pathological features of breast cancer in Pakistan. *J Pak Med Assoc* 2002; 52: 100-4.
9. Gilani SI, Khurram M, Mazhar T, Mir ST, Ali S, Tariq S, et al. Knowledge, attitude and practice of a Pakistani female cohort towards breast cancer. *J Pak Med Assoc* 2010; 60: 205-8.
10. Ahmed F, Mahmud S, Hatcher J, Khan SM. Breast cancer risk factor knowledge among nurses in teaching hospitals of Karachi, Pakistan: a cross-sectional study. *BMC Nurs* 2006; 5: 6.
11. Smith RA, Cokkinides V, Brooks D, Saslow D, Shah M, Brawley OW. Cancer screening in the United States, 2011: A review of current American Cancer Society guidelines and issues in cancer screening. *CA Cancer J Clin* 2011; 61: 8-30.
12. Okobia MN, Bunker CH, Okonofua FE, Osime U. Knowledge, attitude and practice of Nigerian women towards breast cancer: a cross-sectional study. *World J Surg Oncol* 2006; 4: 11.
13. Heidari Z, Mahmoudzadeh-Sagheb HR, Sakhavar N. Breast cancer screening knowledge and practice among women in southeast of Iran. *Acta Medica Iranica* 2008; 46.
14. Gilani SI, Khurram M, Mazhar T, Mir ST, Ali S, Tariq S, et al. Knowledge, attitude and practice of a Pakistani female cohort towards breast cancer. *J Pak Med Assoc* 2010; 60: 205-8.
15. Ibrahim EM, al-Idrissi HY, al-Khadra AH, Kurashi NY, al-Jishi FM, Saied I, et al. Women's knowledge of and attitude toward breast cancer in a developing country: implications for program interventions--results based on interviewing 500 women in Saudi Arabia. *J Cancer Educ* 1991; 6: 73-81.
16. Milaat WA. Knowledge of secondary-school female students on breast cancer and breast self-examination in Jeddah, Saudi Arabia. *East Mediterr Health J* 2000; 6: 338-44.
17. Mudduwa L, Wijesinghe C. Awareness of breast cancer among females with breast diseases. *Galle Med J* 2008; 13: 14-8.
18. Sim HL, Seah M, Tan SM. Breast cancer knowledge and screening practices: a survey of 1,000 Asian women. *Singapore Med J* 2009; 50: 132-8.
19. Ho V, Yamal JM, Atkinson EN, Basen-Engquist K, Tortolero-Luna G, Follen M. Predictors of breast and cervical screening in Vietnamese women in Harris County, Houston, Texas. *Cancer Nurs* 2005; 28: 119-29.
20. Wong-Kim E, Wang CC. Breast self-examination among Chinese immigrant women. *Health Educ Behav* 2006; 33: 580-90.
21. Gwarzo UM, Sabitu K, Idris SH. Knowledge and practice of breast-self examination among female undergraduate students of Ahmadu Bello University Zaria, northwestern Nigeria. *Ann Afr Med* 2009; 8: 55-8.
22. Maqsood B, Zeeshan MM, Rehman F, Aslam F, Zafar A, Syed B, et al. Breast cancer screening practices and awareness in women admitted to a tertiary care hospital of Lahore, Pakistan. *J Pak Med Assoc* 2009; 59: 418-21.