

RESEARCH COMMUNICATION

Do We Need to Maximise the Breast Cancer Screening Awareness?: Experience with an Endogamous Society with High Fertility

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Abstract

Background: In the State of Qatar, breast cancer has become the most common form of cancer among women. The aim of this study was to explore knowledge, attitude and practice about breast cancer and to identify potential barriers to screening procedures among women. **Methods:** This multistage sampling cross sectional survey in primary health care centers and the outpatient department of the Women's Hospital in the State of Qatar targeted a representative sample of 1,200 Qatari women aged between 30 to 55 years of age during the period from December 2008 to April 2009. A total 1,002 subjects (83.5%) consented to participation. Face to face interviews were conducted with a designed questionnaire covering knowledge about breast cancer, attitudes and practices of breast cancer screening. Socio-demographic variables were included. **Results:** The majority of Qatari women demonstrated an adequate knowledge about breast cancer, with a significant relation to education status. Almost three quarters were aware that breast cancer is the most common cancer in women. A good proportion knew that nipple retraction (81.2%) and discharge of blood (74.6%) are warning signs. Of the studied Qatari women, 24.9% identified breast self examination, 23.3% clinical breast examination (CBE) and 22.5% mammography as methods for detection of breast cancer. The frequently reported barriers among the Qatari women were asking any doctor/nurse how to perform breast self examination (57.3%), embarrassment about CBE (53.3%) and fear of mammography results (54.9%). Univariate and multivariate logistic regression analysis showed that family history, level of education, living in an urban area and having medical check-ups when healthy were significant predictors for CBE and mammography. **Conclusion:** The study findings revealed that although Qatari women had adequate general knowledge about breast cancer, the screening rates for BSE, CBE and mammography were low, these being performed most frequently by young Qatari women with a higher level of education.

Key Words: Breast cancer - screening - awareness - Qatar females

Asian Pacific J Cancer Prev, 10, 599-604

Introduction

Breast cancer appears to be a major global health problem of both the developing and developed countries. It is one of the most common cancers among females worldwide (World Health Organization). Global statistics show that the annual incidence of breast cancer is increasing and this is occurring more rapidly in countries with a low incidence rate of breast cancer (Parkin et al., 2005). It has been reported that each year over 1.5 million women worldwide are diagnosed with breast cancer and 502,000 die from the disease (World Health Organization 2009). In Western countries, breast cancer is the most commonly diagnosed cancer in women and the second

leading cause of mortality and morbidity in women (Jamal et al., 2002). In United States, breast cancer has been increasing at an alarming rate and is considered to be of epidemic proportions in the country. The current estimates in US indicate that 1 in 8 women will develop breast cancer in their life time (American Cancer Society, 2006).

Breast cancer can tremendously affect women's quality of life. The disease is progressive and small tumors are more likely to be at an early stage so that their early detection is more likely to have a better prognosis and more successful treatment. Thus early detection of breast cancer by population based screening programs would be potentially useful approach for controlling the diseases (Haji Mahmoodi et al., 2002). Sadler et al (2001a) also

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reported that early detection and prompt treatment offer the greatest chance of long-term survival. Cancer screening tests play an important role in reducing breast cancer related morbidity and mortality. Screening is related to perceptions of risk, benefit and barriers through a reasoning process that includes personal and social influences and attitude.

Qatar, being an endogamous society, the consanguinity rate is very high (51%) (Bener and Alali, 2006). It was reported in two previous studies that consanguinity is linked to an increased overall risk of cancer and elevated risk of breast cancer (Bener et al., 2007a; Liede et al., 2002). This might be a reason for having the high incidence rate of breast cancer (30.1/100,000) in Qatar which is very high compared to other Middle Eastern Countries (Bener et al., 2007b). Also, during the recent period, it was observed that breast cancer ranked first in the population which really alarmed the health authorities to focus on prevention and early detection of breast cancer. In Qatar, the total fertility rate of women in their child bearing age is 5 children. The overall mean parity of five children per woman reflects a relatively high level of fertility (Bener et al., 2005). The use of modern methods of family planning is not widespread among Qatari women which can lead to short birth intervals that affect the health of the mother and the breast feeding. More recently study reported (Gajalakshmi et al., 2009) that breastfeeding cuts the risk of cancer by lowering the levels of some cancer related hormones in the mother's body. Hence, it is important to increase the awareness of Qatari women toward breast cancer screening methods for its early detection.

Early detection of breast cancer can be achieved by performing breast self examination (BSE), clinical breast examination (CBE) and mammography. Screening and early detection of breast cancer through a combination of monthly BSE, regular CBE and annual mammography beginning at age of 40 years are the best ways to limit morbidity and mortality from breast cancer (Sadler et al., 2001a; Pearlman et al., 1999; Bener et al., 2001). It is essential to have comprehensive knowledge, attitude and practice of screening methods in the target population, stressing the importance of implementing it as a routine and preventive measures for early diagnosis of breast cancer. Some studies have reported that improved knowledge and attitudes positively affect the screening behaviour of women (Sadler et al., 2001a; Bener et al., 2001).

While breast cancer is a serious health problem to countries, breast cancer screening remains underutilized because of many barriers such as costs, mammogram procedures, lack of knowledge about the benefits of early screening, and many other factors such as cultural or social factors. Previous research (Sadler et al., 2001a; Bener et al., 2001) has highlighted that self care education related to breast health can positively influence outcomes such as increasing the awareness of breast cancer, practicing BSE and seeking regular professional breast examination. There is also evidence that most of the early breast tumors are self discovered and that the majority of early discoveries are by BSE performers (Pearlman et al., 1999).

The increasing trend of incidence rate of breast cancer (Bener et al., 2007b; Salim et al., 2009) shows the lack of knowledge of the risk of breast cancer and the screening methods among women in Qatar. In order to improve the awareness and knowledge of women about breast cancer, it is important to initiate interventions to provide health education and to encourage preventive health care behaviours. Hence, this study aimed to evaluate knowledge, attitude and practice about breast cancer and its screening procedures among Qatari national women.

Materials and Methods

This is a cross-sectional study based on the Primary Health Care (PHC) Centers and the outpatient clinics of the Women's hospital among Qatari women from December 2008 to April 2009. A questionnaire was designed for this purpose and administered to Qatari women aged 30 - 55 years who were attending primary health care centers and outpatients of the Women's hospital for various reasons. A questionnaire was designed covering all the questions related to knowledge about breast cancer, their attitudes and practices towards screening of breast cancer and its potential barriers. Allowing with an error of 2.5%, and 95% confidence interval with the prevalence rate of 27%, the computer program computed a sample size of 1200 subjects would be needed to achieve the objective of our study.

A multistage stratified sampling design was developed, using an administrative division of the Qatar into 21 PHCs in terms of number of inhabitants, but, only 11 health centers were visited mostly by Qataris, and remaining 10 health centers were excluded from our survey. Also, selected 11 health centers represented mostly the Qatari population geographically, East, West, North, South and Central location of Qatar. The subjects were selected by simple random sampling among population who visited the 11 health centers (8 urban and 3 semi urban) for various reasons other than cancer treatment. Qualified Nurses and Health Educators were instructed to structurally interview and complete a questionnaire for randomly selected Qatari women of age group (30-55) years. A total of 1200 Qatari women were approached and 1002 Qatari women agreed to participate in the study (83.5%). 198 women were excluded from the study due to incomplete questionnaire or did not want to respond to the Questionnaire lack of timing.

The questionnaire and criteria for knowledge, attitude and practice towards breast cancer and the potential barriers to screening were defined and developed by the Principal Investigator. A translated Arabic version of the questionnaire was revised by a bilingual consultant. The survey instrument was then tested on 100 randomly selected women visiting PHCs and outpatient clinics of the Women's hospital.

The Student-t test was used to ascertain the significance of differences between mean values of two continuous variables and was confirmed by non-parametric Mann-Whitney test. Chi-square and Fisher's exact tests (two-tailed) were performed to test for differences in proportions of categorical variables between

two or more groups. Multiple Logistic regression analysis using the forward inclusion and backward deletion method was used to assess the relationship between dependent and independent variables and to adjust for potential confounders and orders the importance of risk factors (determinant). The level $p < 0.05$ was considered as the cut-off for significance.

Results

Table 1 reveals the knowledge level of Qatari women about breast cancer, screening and its risk factors by their level of education. Qatari women with higher education had a better general knowledge about breast cancer, although they were in lower in number (473) than women with lower education (529). Table 2 shows the screening methods used by the studied Qatari women according to their socio-demographic characteristics while Table 3

Table 1. Correct Answers about Breast Cancer, its Risk Factors and Screening among Qatari Women (N=1002)

Variables	Education		p-value
	Low N=529	High N=473	
General			
Breast self-examination is good in finding small lumps in the breasts.	277 (52.4)	307 (64.9)	<0.001
Some lumps in the breasts will turn into cancer if they are left alone.	366 (69.2)	341 (72.1)	0.314
In early stages, cancer of the breast is painful.	346 (65.4)	337(71.2)	0.048
Women ≥ 50 should have a mammogram every two years.	176 (33.3)	127 (26.8)	0.027
Mammography is a painful procedure.	389 (73.5)	340 (71.9)	0.557
Mammography can show a lump in the breast before the woman or her doctor can feel it on examination.	285 (53.9)	322 (68.1)	<0.001
Breast cancer is the most common cancer in women.	351 (66.4)	353 (74.6)	0.004
Healthy women should go for mammogram at certain intervals?	254 (48.0)	270 (57.1)	0.004
Symptoms			
Painless mass	424 (80.2)	391 (82.7)	0.308
Multiple masses	459 (86.8)	421 (89.0)	0.279
Nipple retraction	434 (82.0)	380 (80.3)	0.491
Breast pain	136 (25.7)	112 (23.7)	0.457
Milky discharge	252 (47.6)	202 (42.7)	0.118
Breast asymmetry	388 (73.3)	384 (81.2)	0.003
Bloody discharge	373 (70.5)	374 (79.1)	0.002
Risk factors			
Age	370 (69.9)	283 (59.8)	0.001
Diet	271 (51.2)	261 (55.2)	0.211
Contact with relative with breast cancer	394 (74.5)	366 (77.4)	0.285
Positive family history	432 (81.7)	414 (87.5)	0.011
Prolonged lactation	393 (74.3)	364 (77.0)	0.327
Overweight	367 (69.4)	316 (66.8)	0.384
Infertility	369 (69.8)	324 (68.5)	0.668
Oral contraceptive pills	113 (21.4)	92 (19.5)	0.454

* Lower education is below secondary; ** Higher education is \geq secondary

shows data for the attitudes and practices of Qatari women towards breast cancer screening.

Table 4 shows potential barriers among studied Qatari women towards breast cancer screening and Table 5 determines the predictors of breast cancer screening

Table 2. Screening Methods used by the Studied Qatari Women According to their Socio-demographic Characteristics (N=1002)

Variables	BSE N=249	CBE N=233	Mammography N=225
Age (Mean \pm SD)	41.1 \pm 7.6	41.2 \pm 7.4	40.8 \pm 7.1
Age group			
30-39	115 (46.2)	103 (44.2)	99 (44.0)
40-49	87 (34.9)	100 (42.9)	102 (45.3)
50-59	47 (18.9)	30 (12.9)	24 (10.7)
Marital Status			
Single	7 (2.8)	3 (1.3)	4 (1.8)
Married	242 (97.2)	230 (98.7)	221 (98.2)
No of children			
None	14 (5.6)	12 (5.2)	10 (4.4)
≤ 5	119 (47.8)	125 (53.6)	96 (42.7)
> 5	116 (46.6)	96 (41.2)	119 (52.9)
Education			
Illiterate	6 (2.4)	11 (4.7)	12 (5.3)
Primary	38 (15.3)	29 (12.4)	45 (20.0)
Intermediate	58 (23.3)	62 (26.6)	53 (23.6)
Secondary	78 (31.3)	71 (30.5)	70 (31.1)
University	69 (27.7)	60 (25.8)	45 (20.0)
Occupation			
Sedentary	94 (37.8)	71 (30.5)	92 (40.9)
Professional	66 (26.5)	60 (25.8)	49 (21.8)
Business woman	10 (4.0)	12 (5.2)	8 (3.8)
Manual	7 (2.8)	6 (2.6)	1 (0.4)
House wife	72 (28.9)	84 (36.1)	75 (33.3)
Household income			
< 5000	12 (5.0)	11 (5.5)	10 (5.2)
5000-9999	67 (27.7)	62 (31.2)	82 (42.3)
10,000-14,999	67 (27.7)	52 (26.1)	42 (21.6)
$> 15,000$	96 (39.7)	74 (37.2)	60 (30.9)
No. of visits to HC during the last year			
< 5	140 (56.2)	119 (51.1)	96 (42.7)
5-10	99 (39.8)	93 (39.9)	117 (52.0)
> 10	10 (4.0)	21 (9.0)	12 (5.3)

BSE, Breast self examination at least once per month; CBE, Clinical breast examination ever

Table 3. Attitudes and Practices of Qatari Women towards Breast Cancer Screening (N=1002)

Variables	Yes	No
Attitudes		
It is difficult for a woman to learn how to examine her own breasts for lumps.	248 (24.8)	754 (75.2)
Do you agree to have breast examination by a doctor?	632 (63.1)	370 (36.9)
Are you afraid of mammogram detecting cancer?	636 (63.5)	366 (36.5)
Are you concerned about the embarrassment of having a mammogram?	495 (49.4)	507 (50.6)
Practice		
Breast Self Examination		
	249 (24.9)	753 (75.1)
Clinical Breast Examination		
	233 (23.3)	769 (76.7)
Mammography		
	225 (22.5)	777 (77.5)

Table 4. Potential Barriers among Studied Qatari Women towards Breast Cancer Screening

Potential barriers	Yes	No
General		
Are you scared and worried of breast cancer?	466 (46.5)	536 (53.5)
I would rather not know if something is wrong with my breasts.	533 (53.2)	469 (46.8)
Breast Self Examination		
Have you ever been shown by a doctor or a nurse how to examine your own breast for lumps?	428 (42.7)	574 (57.3)
Do you have proper knowledge to perform breast self-examination?	316 (31.5)	686 (68.5)
Do you feel breast examination can be painful?	317 (31.6)	685 (68.4)
I don't perform breast self exam because I am afraid to find a lump.	329 (32.8)	673 (67.2)
Clinical Breast Examination		
Is it difficult to find time for a clinical breast examination?	286 (28.5)	716 (71.5)
Do you prefer to have female doctor to examine breasts?	442 (44.1)	560 (55.9)
Are you embarrassed to have breast examined by a healthcare professional?	534 (53.3)	468 (46.7)
Mammography		
Do you think that mammography procedure causes discomfort?	325 (32.4)	677 (67.6)
Are you afraid of mammography results thinking it may cause worry?	550 (54.9)	452 (45.1)
Is it difficult to find time to schedule mammography?	287 (28.6)	715 (71.4)
Would your husband or any other family member object for mammography?	89 (8.9)	913 (91.1)
Is morning time difficult to visit a screening centre for mammography?	339 (33.8)	663 (66.2)
Do you have transport problem to go for mammography?	281 (28.0)	721 (72.0)

procedures through multivariate logistic regression analysis. Proper knowledge to perform BSE was related to higher odds of women performing breast self examination. A positive family history, level of education, living in urban area and went for medical check up when healthy were significant common predictors for CBE and mammography.

Discussion

The present study findings provided new insights into the perceptions, knowledge, beliefs, attitudes, and practices of Qatari women towards breast cancer and its screening program. The present study revealed that majority of the respondents had adequate knowledge of breast cancer irrespective of their level of education. 70.3% reported that breast cancer is the most common cancer in women. Qatari women with higher education had better general knowledge about breast cancer and a significant difference was observed in every knowledge response between lower and higher educated women. On the contrary, few other studies have shown unsatisfactory knowledge level of women about breast cancer and its screening procedures. A study from our neighbouring country, Saudi Arabia (Jahan et al., 2006), found that only

Table 5. Multivariate Logistic Regression Analysis for Determining Predictors of Screening

Variables	Odds ratio	95% CI	P-Value
Breast Self Examination			
Proper knowledge to perform BSE	3.415	2.120-5.500	<0.001
Knowledge: Some lumps in the breasts will turn into cancer if left alone	2.568	1.605-4.110	<0.001
Embarrassment to see a doctor/nurse how to perform BSE	1.684	1.088-2.608	0.019
Knowledge of age as symptom	1.556	1.028-2.356	0.037
Family Income	1.312	1.591-1.082	0.006
Education Level	1.308	1.099-1.556	0.003
Clinical Breast Examination			
Went for medical check up when healthy	2.373	1.674-3.363	<0.001
Agree to have breasts examined by a doctor	1.964	1.336-2.886	<0.001
Living area: Urban	1.907	1.276-2.849	0.002
Family history	1.905	1.043-3.480	0.036
Level of education	1.388	1.185-1.626	<0.001
Mammography			
Went for medical check up when healthy	2.309	1.639-3.253	<0.001
Living area: Urban	1.973	1.325-2.938	<0.001
Knowledge: Positive family history	1.884	1.032-3.439	0.039
Knowledge: Overweight	1.842	1.250-2.715	0.002
Education level	1.464	1.251-1.712	<0.001

30.3% of the women had heard about BSE and 18.7% reported they practiced BSE. Another study in Saudi Arabia showed that, irrespective of their educational status, the women had knowledge deficits regarding breast cancer risk factors and underutilization of the recommended breast cancer screening (Amin et al., 2009). In a survey of breast cancer knowledge, Uche (1999) in Nigeria reported that only 32% of the respondents knew that a breast lump was a warning sign for the breast cancer, 58.5% were unaware of most warning signs and only 9.8% knew methods of detecting breast cancer. Among Korean American women (Sadler et al., 2001B), only 16.3% reported they had adequate breast cancer knowledge. Results of an Egyptian study (Yamni and Aziz, 2000) of women academics showed that only 10.6% and 11.5% had satisfactory knowledge about breast cancer. Similarly, a study done in Malaysia (Parsa et al., 2008) reported that despite the level of education, almost three quarters of the female teachers were in the low knowledge category about breast cancer symptoms and risk factors. Whereas in the present study, 70.6% knew breast lumps can turn into cancer and 58.3% acknowledged BSE is good in finding small lumps in breasts. With regard to the symptoms of breast cancer, a good proportion of Qatari women knew that nipple retraction (81.2%) and discharge of blood (74.6%) are warning signs of breast cancer.

A Swedish study (Lagerland et al., 2000) reported that being knowledgeable about breast cancer is the only significant variable in practicing screening methods. But, despite of having a sufficient level of knowledge about breast cancer among Qatari women, our results confirm low breast cancer screening in Qatari women. Of these

Qatari women, only 24.9% identified breast self examination, 23.3% reported having clinical breast examination and 22.5% underwent mammography. Even in Turkish women (Dundar et al., 2006), although 72.1% of the participants reported having a knowledge of BSE, only 40.9% of the women practiced BSE, 25% had CBE and 10.6% stated they had mammography tests. In Iran (Montazeri et al., 2008), 61% believed that breast cancer is relatively a common disease among women, but 31% only knew BSE, 21% CBE and 9% about mammography. A good proportion of Iranian women claimed that they did not know much about screening procedures. The screening rates found in these studies are in agreement with our study findings that although the level of knowledge of breast cancer was acceptable in women, they were not very keen in practicing screening procedures. There was a better screening rates found in a study done in the United States that mammography screening rates ranging from 41% to 66% have been reported among Filipino and Korean immigrants (Maxwell et al., 1997; Maxwell et al 2000). The difference may be due to the screening program facilities and more community education programs in the U.S.

BSE, CBE and mammography were performed more often in young Qatari women with higher level of education and employed in sedentary jobs. It was found older Qatari women demonstrated poorer screening practices for breast cancer. Similarly a previous study done by Bener et al. (2001) in UAE reported that BSE and CBE were commonly practiced by women who were younger, more educated and employed. Mammography was practiced by employed Emirati women of higher income. Mammography is an expensive modality for screening. In Qatar, all medical services are free for nationals and household income is not a barrier for CBE and having mammography tests. In contrast to these study findings, in Jordan (Petro-Nustas, 2001), it was found that the majority of the older women performed breast cancer screening activities on a regular basis.

Although a majority of Qatari women had a positive attitude towards BSE and CBE, their attitude towards having a mammogram test was mostly negative. 75.2% of Qatari women thought that BSE is not difficult to learn and 63.1% agreed to have CBE by a doctor, but most of them were afraid (63.5%) and embarrassed (49.4%) of having mammography tests. This is in contrast to the finding by Marinho et al (2008) that although many of the participants had a favourable attitude towards mammography, only 35.7% had it routinely and adequately performed.

In our study sample, fear and worries were the general potential barriers towards breast cancer screening (46.5%). Embarrassment for clinical breast examination (53.3%) and fear of mammography results (54.9%) thinking positive were the frequently reported barriers in Qatari women. In Chinese women (Chua et al., 2005), lack of time and costs were the most frequent reported reasons for their reluctance to participate in CBE or mammography screenings.

In Qatari women, positive family history, level of education, living in urban area and went for medical check

up were significant predictors for CBE and mammography. In UAE9, mammography was positively associated with employment, living in semi-urban areas, having a high income and making fewer visits to PHC clinics. Positive family history was a notable predictor in most of the studies (Cohen, 2006; Bener et al., 2002; Sadikoglu et al., 2008).

More recently in Nigeria a cross-sectional survey conducted among 200 schoolteachers (Odusanya, 2001) showed that eightyfive percent knew breast cancer was a serious disease, but only 53.2% knew that a breast lump was the most commonly recognized sign. Only 13.8% knew the methods of diagnosis, and knowledge of risk factors was also poor. Breast self-examination was practiced by 62% of respondents; 11% practiced it on a monthly basis, but only 25% were deemed to possess sufficient knowledge about the procedure. The level of awareness on breast cancer was very low among this group of female schoolteachers.

Siahpush and Sing (2002) suggested that mammography and CBE facilitate early detection and treatment of breast cancer, which is responsible for lower mortality rates. The present study emphasizes the fact that women should be knowledgeable about the high cancer risks involved for not having screening methods for early detection of breast cancer. If the community is not aware about risk factors of breast cancer, they cannot change their life style risk factors and decrease modifiable risk factors and actively prevent breast cancer.

The study findings revealed that although Qatari women had adequate general knowledge about breast cancer, the screening rates of BSE, CBE and mammography were low in women for early detection of cancer. Education appeared to be the major determinant of level of knowledge and practicing screening procedures. Older Qatari women demonstrated poorer breast cancer screening practices. The three screening procedures were performed more often in young Qatari women with higher level of education. Fear and worries were the general potential barriers towards breast cancer screening. Minimizing barriers to screening behaviours may be effective in convincing women for early detection of breast cancer.

Acknowledgement

This work was generously supported and funded by the Qatar National Research Fund- QNRF UPRP 05-034-3-014. The authors would like to thank the Hamad Medical Corporation for their support and ethical approval.

References

- American Cancer Society (2006): California Cancer Facts and Figures, 2007. Edited by: California Division and Public Health Institute CCR. Oakland, CA, American Cancer Society, California Division.
- Amin, TT, Al Mulhim AR, Al Meqihwi (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.

- Bener A, Al Wash R, Miller CJ, Denic S, Dunn EV (2001). Knowledge, attitudes and practices related to breast cancer screening: A survey of Arabic women. *J Cancer Educ*, **16**, 215-20.
- Bener A, Alali K (2006). Consanguineous marriages in the newly developed country: Qatari population. *J Biosocial Sci*, **38**, 239-46.
- Bener A, Ayub H, Kakil R, Ibrahim W (2007b). Patterns of cancer incidence among the population of Qatar: A worldwide comparative study. *Asian Pac J Cancer Prev*, **9**, 19-24.
- Bener A, Honein G, Da'ar Z, Miller CJ, Dunn EV (2002). The determinants of breast cancer screening behaviour: A focus group study of women in the United Arab Emirates. *Oncol Nursing Forum*, **29**, 91-8.
- Bener A, Hussain R, Teebi AS (2007a). Consanguineous marriages and their effects on diseases: studies from an endogamous population. *Medical Principles and Practice*, **16**, 262-7.
- Bener A, Zirir M, Al-Rikabi R (2005). Genetics, obesity and environmental risk factors associated with type 2 diabetes. *Croatian Med J*, **46**, 302-7.
- Chua MST, Mok TS, Kwan WH, Yeo W, Zee B (2005). Knowledge, perceptions, and attitudes of Hong Kong Chinese women on screening mammography and early breast cancer management. *The Breast J*, **11**, 52-6.
- Cohen M (2006). Breast cancer early detection, health beliefs and cancer worries in randomly selected women with and without a family history of breast cancer. *Psychooncology*, **15**, 873-83.
- Dundar PE, Ozmen D, Ozturk B, et al (2006). The knowledge and attitudes of BSE and mammography in a group of women in a rural area in Western Turkey. *BMC Cancer*, **6**, 43-8.
- Gajalakshmi V, Mathew A, Brennan P, et al (2009). Breast feeding and breast cancer risk in India - a multicenter case control study. *Int J Cancer*, **125**, 662-5.
- Haji-Mahmoodi M, Montazeri A, Jarvandi S, et al (2002). Breast self examination: Knowledge, attitudes, and practice among female health care workers in Tehran, Iran. *Breast J*, **8**, 222-5.
- Jahan S, Al-Saigul AM, Abdelgadir MH (2006). Breast cancer, knowledge, attitudes and practices of BSE among women in Qassim region of Saudi Arabia. *Saudi Med J*, **27**, 1737-41.
- Jamal A, Thomas A, Murray T, Thun M (2002). Cancer statistics. *CA Cancer J Clin*, **52**, 23-47.
- Lagerland M, Hedian A, Sparen P, Thurfell E, Lambe M (2000). Attitudes, beliefs, and knowledge as predictors of non attendance in a Swedish population based mammography screening program. *Prev Med*, **31**, 417-28.
- Liede A, Malik IA, Aziz Z, et al (2002). Contribution of BRCA1 and BRCA2 mutations to breast and ovarian cancer in Pakistan. *Am J Hum Genet*, **71**, 595-606.
- Marinho LAB, Cecatti JG, Osis MJD, Gurgel MSC (2008). Knowledge, attitude and practice of mammography among women users of public health services. *Rev Saude Pub*, **42**, 2.
- Maxwell AE, Bastani R, Wards US (1997). Breast cancer screening and related attitudes among Filipino-American women. *Cancer Epidemiol Biomarkers Prev*, **6**, 719-26.
- Maxwell AE, Bastani R, Wards US (2000). Demographic predictors of cancer screening among Filipino and Korean immigrants in the United States. *Am J Prev Med*, **18**, 62-8.
- 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 Pacific Family Med*, **7**, 6.
- Odusanya OO (2001). Breast cancer: knowledge, attitude and practice of female schoolteachers in Lagos, Nigeria. *Breast J*, **7**, 171-5.
- Parkin DM, Bray F, Ferlay J, Pisani P (2005). Global cancer statistics. *CA Cancer J Clin*, **55**, 74-108.
- Parsa P, Kandiah M, Zulkefi NAM, Abdulrehman H (2008). Knowledge and behaviour regarding breast cancer screening among female teachers in Selangor, Malaysia. *Asian Pac J Cancer Prev*, **9**, 221-7.
- Pearlman DN, Clark MA, Rakowski W, Enrich B (1999). Screening for breast and cervical cancers: The importance of knowledge and perceived survivability. *Women and Health*, **28**, 93-113.
- Petro-Nustas W (2001). Young Jordanian women's health beliefs about mammography. *J Comm Hlth Nursing*, **18**, 177-94.
- Sadikoglu G, Ozcakir A, Bayram N, Bilgel N (2008). The knowledge and attitudes about mammography in a group of Turkish women who attended a family medicine clinic. *Breast J*, **14**, 601-602.
- Sadler GR, Dhanjal SK, Shah NB, et al (2001a). Asian India women: Knowledge, attitudes and behaviours toward breast cancer early detection. *Pub Health Nurs*, **18**, 357-363.
- Sadler GR, Ryujin LT, KO CM, Nguyen E (2001b). Korean women: breast cancer knowledge, attitudes and behaviours. *BMC Pub Hlth*, **1**, 7.
- Salim EI, Moore MA, Al-Kayed S, et al (2009). Cancer epidemiology in the Arab Region - past, present and future. *Asian Pac J Cancer Prev*, **10**, 27- 44.
- Siahpush M, Sing GK (2002). Socio-demographic variations in breast cancer screening behaviour among Australian. *Prev Med*, **35**, 174-80.
- Uche EE (1999). Cancer awareness among a Nigerian population. *Trop Doct*, **29**, 39-40.
- World Health Organization. Cancer. <http://www.who.int/medicentre/factsheets/fs/297/3n> (accessed on 10/3/2009)
- Yamni Seif N, Aziz M (2000). Effect of BSE training program on knowledge, attitude and practices of a group of working women. *J Egyptian Natl Cancer Inst*, **12**, 105-15.