

## RESEARCH COMMUNICATION

# Knowledge and Behavior Regarding Breast Cancer Screening among Female Teachers in Selangor, Malaysia

Parisa Parsa<sup>1\*</sup>, Mirnalini Kandiah<sup>2</sup>, Nor Afiah Mohd Zulkefli<sup>3</sup>, Hejar Abdul Rahman<sup>3</sup>

### Abstract

A cross-sectional study was carried out to determine the knowledge and practices of 425 female secondary school teachers from 20 selected secondary schools in Selangor, Malaysia on breast cancer screening (BCS). A self-administered, structured questionnaire was used for data collection. This study showed moderate to low knowledge on breast cancer (BC) and BCS among teachers. Only 19%, 25% and 13.6% eligible women performed breast self-examination (BSE), clinical breast examination (CBE) and mammography respectively, on a regular basis. Level of breast cancer knowledge was significantly associated with BSE ( $p=0.000$ ). Having heard/ read about BCS, and regular visit with a physician were associated with BCS behaviors ( $P<0.05$ ). There was no association between BCS behaviors ( $P>0.05$  and age, family history of breast cancer, marital status or having health insurance). Efforts are needed to increase knowledge and remove misconceptions about breast cancer and screening practices among Malaysian women.

**Key Words:** Breast cancer screening -behavior - knowledge - Malaysian women teachers

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### Introduction

Breast cancer is the leading cancer in women today. (American Cancer Society, 2005; WHO, 2005). Globally the total number of new cases of breast cancer diagnosed annually exceeds one million, and this figure is expected to reach 1.5 million by 2010. In Malaysia, it is the most frequently diagnosed cancer in women, irrespective of ethnic and age groups, accounting for 30.4% of newly diagnosed cases in 2003 (Lim et al., 2003). A Malaysian women's cumulative risk of getting breast cancer during her lifetime is 1 in 19 with the highest risk being in Chinese women (1 in 14).

It has also been reported that in Malaysian women breast cancer presents in advanced stages with large tumor sizes. According to Hisham and Yip (2003), the mean tumor size at presentation was 5.4 cm (range: 1–20 cm), and the advanced stage of breast cancer is observed to be highest among the Malay ethnic group. Socio-cultural factors and poverty may be underlying factors for the delay in presentation among Malaysian breast cancer patients. With early detection the 5-year survival rate is 92%. However, with local invasion, the survival rate decreases to 71%, and if it is diagnosed at Stage IV, only 18% of women survive (Lauver et al., 1999). Breast cancer not only threatens the life of a woman but also effects her gender identity and body image. Therefore, early detection

of breast cancer can secure women against premature mortality, physical defects as well as psychological distress. Early detection of breast cancer can be achieved by performing breast-self examination (BSE), clinical breast examination (CBE), and mammography.

In a community study conducted by the Ministry of Health Malaysia among 59,903 women in all states of Malaysia, BSE and CBE were reported to be performed by 34% and 31% of women above 20 years of age, respectively. While mammography was carried out in only in 3.8% of women 50 years and older. This study also showed a significant difference in screening rates between urban and rural areas (50.6% versus 42.3% respectively,  $P<0.05$ ) (Narimah, 1997). In addition, several studies have reported that lower breast cancer screening rates are associated with inappropriate and poor levels of knowledge and perceptions of preventive health measures (Bener et al., 2002; Petro-Nustus and Mikhail, 2002; Franzer et al., 2005).

In some studies there is a suggestion that women in certain occupations, such as teaching, have a higher risk of breast cancer although the evidence so far is equivocal (Goldberg and Labreche, 1992; Rubin et al., 1993; Coogan and Clapp, 1996; Petralia and Vena, 1999; Bernstein et al., 2002; Horn-Ross et al., 2002). Over 25 studies in the United States and internationally have documented the increased incidence of breast cancer among teachers, as

<sup>1</sup>Department of Maternal and Child Health, Hamedan University of Medicine and Health Sciences, Hamedan, Iran, <sup>2</sup>Department of Nutrition and Dietetics, <sup>3</sup>Department of Community Health, Faculty of Medicine and Health Sciences, University Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia \*For Correspondence: Email: pparsa2003@yahoo.com

noted in a review of occupational risk factors for breast cancer (Goldberg and Labreche, 1992). In a prospective study, California female teachers were noted to have a 51% higher age standardized invasive breast cancer incidence rate and a 67% higher in-situ breast cancer incidence rate than would be expected based on race specific statewide rates after three years follow up (Bernstein et al., 2002). Similarly, another study in the USA suggested that teachers had twice the risk of dying of breast cancer than other women (Rubin et al., 1993). However, the results of other studies do not support a positive association between this occupation and the risk of breast cancer (Coogan and Clapp, 1996, Petralia and Vena, 1999). A number of positive studies were based on registry data where it was impossible to control for confounders such as lifestyle and reproductive factors.

Over the years education and communication have been emphasized to encourage health seeking behavior change, with several studies addressing how to improve breast cancer knowledge and screening practices among women teachers (Pavia et al., 1999; Yanni Seif and Aziz, 2000; Galedar, 2001; Madanat and Merrill, 2002; Jarvandi et al., 2006). However, these assume teachers are aware of breast cancer risk factors and recommended screening guidelines. Several studies have shown inadequate levels of knowledge of breast cancer screening methods as well as screening behaviors among female teachers (Galedar, 2001; Madanat and Merrill, 2002). Results of an Egyptian study of women academics showed that only 10.6% and 11.5% had satisfactory knowledge about breast cancer and breast self examination, respectively (Yanni Seif and Aziz, 2000). Studies of female teachers and academics in Iran, Jordan and Egypt showed similarly low prevalence of performing monthly BSE (6%, 7% and 11% respectively), and only 30% of teachers above the age of 40 years in Italy undertook monthly BSE (Pavia et al., 1999).

Besides knowledge, psychosocial factors influence a person's health behavior. The social support theory describes cancer and screening as stressors that could be buffered by being part of a supportive network (Wagle et al., 1997). The cognitive transactional model of stress and coping describes screening as a way to cope with anxiety associated with being at risk (Barron et al., 1997). Screening involves a dynamic process of moving through stages of contemplation and action following the propositions of the transtheoretical model (Pearlman et al., 1996). The health belief model (HBM) appeared most frequently in the literature explaining breast cancer screening (Becker and Maiman, 1975; Rosenstock et al., 1988). The model suggests that change in preventive health behaviors are based on six factors namely: susceptibility; seriousness; benefits; barriers; health motivation and confidence. According to HBM, women who believe that they are susceptible to breast cancer and that breast cancer is a serious condition are more likely to perform breast cancer screening. Moreover, women who perceive more benefits from BCS and fewer barriers are more likely to perform BCS. Furthermore, the more motivated women are to promote their health and the more confident they are in their ability to perform BSE, the more likely they are to practice BSE (Champion, 1993).

In Malaysia, women constitute 90% of the teaching profession. Considering the important role teachers have in education, they are in a position to educate young people about breast cancer risk factors, types of screening practices, and influence behaviors that will reduce the risk of future breast cancer morbidity and mortality. Therefore the purpose of this study was to assess the level of breast cancer knowledge and screening practices among women secondary teachers in Selangor, Malaysia.

## Materials and Methods

A cross-sectional study was carried out among female secondary school teachers between January and April, 2006. A multi-stage random sampling was used to select the schools. First, six districts out of the nine districts in the state of Selangor were selected randomly. Secondly, four schools were selected from each of these six districts by simple random sampling, adding up to a total of 24 schools. All female teachers (n=1100) in the selected schools were invited to participate. Teachers who did not consent to follow up with the study, or had a previous history of breast cancer were excluded from the study. In all 425 (37%) female teachers agreed to participate and gave informed consent. This study obtained approval from the Ministry of Education Malaysia and Ethics Committee of the Faculty of Medicine and Health Sciences, University Putra Malaysia.

### Instrument

A validated and reliable self-administered, structured questionnaire was used for data collection. Content validity of the questionnaire was ascertained by an expert panel, which comprised two nurses, an oncologist, a radiologist with specialty in breast cancer diagnosis, a science professor and a family medicine physician. Reliability (internal consistency) was assessed by using item-total sub-scale correlation ( $r > 0.30$ ) and Cronbach's alpha. The Cronbach's alpha coefficient was 0.78 for the 43 knowledge questions, indicated that adequate of reliability of the questionnaire (Nunally, 1978). The questionnaire was pretested among 30 female teachers for checking the clarity of the items. The questionnaire consisted of four sections:

#### a) Background information of respondents

In this section information on respondents' age, religion, marital status, occupation status, and monthly income, menstrual and reproductive history was obtained.

#### b) Sources of breast cancer information

This section of the questionnaire examined the sources of breast cancer information.

#### c) Breast cancer screening knowledge

This section consisted of 43 questions, which included 3 questions on general facts about breast cancer, 7 questions on symptoms, 15 questions on risk factors, and 18 questions on breast cancer screening methods. Responses were measured using the nominal scale of "True", "False" and "Do not know". One point was given for a correct answer and zero for an incorrect or no answer. The maximum score for knowledge was 43 (100%) and

**Table 1. Socio-demographic Characteristics of the Respondents (n=425)**

Parameter	Number (%)	
Age (years)	20-30	77 (18.1)
	31-40	202 (45.5)
	41-50	116 (27.3)
	>51	22 (5.0)
Ethnicity	Malay	357 (84.4)
	Chinese	36 (8.5)
	Indian	25 (5.9)
	Others	3 (1.1)
Marital status	Married	378 (84.9)
	Single	38 (9.0)
	Widow	4 (0.9)
	Divorced	3 (0.7)
Religion	Muslim	361 (84.9)
	Buddhist	27 (6.4)
	Hindu	22 (5.2)
	Christian	13 (2.8)
Education	Diploma	27 (5.4)
	Degree	376 (88.9)
	Post graduate	18 (4.3)
	Others	6 (1.4)
Insurance	Uninsured	86 (20.5)
	Government	48 (11.4)
	Private	282 (67.1)
Teaching experience	<10	196 (46.0)
	10-20	170 (40.0)
	20-30	47 (14.0)
Personal income (RM)*	Mean (SD)	2580 (760.0)
	Range	1325-6573
Household income (RM)*	Mean (SD)	5465 (250.0)
	Range	1800-20,000

\* (USD 1= RM 3.4)

the minimum score was 0 (0%). The knowledge level was categorised as "low" for scores within 0-49%, "moderate" for scores within 50-79% and "high" for scores within 80-100% (Lampont and Andre, 1993).

#### d) Practices related to breast cancer screening

This part consisted of 20 questions related to BSE, CBE and mammography. The respondents' practice regarding BCS were measured using the nominal scale of "Regularly", "Occasionally" and "Never". One point was given for regular practice (correct item) and zero point for occasional and never. In addition, information regarding BCS behaviours and the reasons for reluctance for screening were obtained.

To ensure confidentiality and truthfulness of the answers teachers were informed that only code numbers would be used to identify them. Teachers were given one week to complete the questionnaire.

#### Data Analysis

Bivariate correlation analysis, Chi square test, t-test, one-way ANOVA and logistic regression analysis were performed in the data analysis, using SPSS version 13. Significance level was set at  $p < 0.05$ .

## Results

#### General characteristics of the subjects

The mean age of respondents was 37.2 (SD=7.2) and

**Table 2. Distribution of Knowledge on Breast Cancer and Breast Cancer Screening (n=425)**

Parameter	Level of knowledge			Mean score (SD)	Range
	Low n (%)	Moderate n (%)	High n (%)		
Incidence	153 (36)	146 (34)	126 (30)	1.90 (0.9)	0-3
Symptoms	327 (77)	92 (22)	6 (1.4)	2.52 (1.3)	0-7
Risk factors	310 (73)	111 (26)	4 (0.9)	6.02 (2.6)	0-13
Screening methods	179 (42)	225 (53)	21 (4.7)	9.86 (3.1)	0-17
Overall knowledge on BC and BCS	265 (63)	156 (37)	4 (0.7)	20.4 (6.0)	1-34

**Table 3. Knowledge on Breast Cancer Facts (n=425)**

Items	Correct answers	Number (%)
Incidence of breast cancer (BC)		
High prevalence of BC in Malaysia		398 (94.0)
Risk of getting cancer for a Malaysian		174 (41.0)
Risk of getting BC for a Malaysian female		236 (55.5)
Symptoms of breast cancer		
Lump		258 (61.0)
Change in breasts size		175 (41.5)
Breast pain		133 (31.5)
Bloody nipple discharge		293 (69.4)
Nipple retraction		70 (16.6)
Risk factors of BC		
Most prevalent in older age group		179 (42.3)
Association of BC with fat/ energy intake		283 (67.1)
Personal hygiene		224 (53.0)
Having positive family history of BC		358 (84.6)
Effect of prolonged breast feeding		46 (10.0)
Not child bearing		177 (41.8)
Number of children		288 (68.1)
Late age at first child birth		129 (30.5)
Use of HRT		89 (21.0)
Use of OCP		136 (32.2)
Obesity or overweight after menopause		110 (26.1)
Drinking Alcohol		178 (41.9)
Smoking		210 (49.6)
Early menarche		80 (18.9)
Late menopause		55 (13.0)

ranged between 23 to 56 years. Most of them were married, Muslim and Malay. Nearly all of them had degrees and were moderately well off. Some 20% had no medical insurance. Most of teachers had less than 20 years of teaching experience (Table 1).

#### Knowledge on breast cancer facts and screening

The forty three questions on knowledge of breast cancer included: the trends of breast cancer incidence in Malaysia; symptoms; risk factors; and early detection methods of breast cancer. The mean knowledge score was 20.4 (SD=5.9), which meant that correct answers were given to less than half of the questions (Table 2). The highest knowledge score related to breast cancer incidence and the lowest to symptoms of breast cancer.

Table 3 shows that 94% of teachers knew breast cancer had a high incidence rate in Malaysia, but only 55% of them were knowledgeable on the risks of breast cancer for a Malaysian female. With regards to symptoms of breast cancer 69% knew that a bloody discharge from the

nipple was not normal, while only 16.6% knew that there is an association between nipple retraction and breast cancer. Regarding risk factors, only 10.9%, 13%, and 18.9% of respondents knew about the relationship between breast feeding, age of menopause and menarche with breast cancer, respectively.

Regarding the screening methods 98%, 79.3% and 62.9% of respondents selected correct answers on capability of BSE, CBE and mammography to detect early breast cancer, while less than 20% knew about the correct palpation techniques for BSE. In particular, knowledge as to what age was appropriate to initiate BSE, CBE and mammography was important so that women would start and maintain such activities. However, only 58.8%, 62.2% and 8.1% of women answered correctly questions on the initiating age for BSE, CBE and mammography, respectively (Table 4). There was a significant difference in knowledge between those who had heard/read about BSE ( $t=3.25$ ,  $p=0.00$ ), CBE ( $t=5.22$ ,  $p=0.00$ ), mammography ( $t=5.67$ ,  $p=0.00$ ), and those who did not. There were no significant difference in knowledge in relation to age, religion, ethnic group, marital status, educational level, family history of breast cancer, and regular visits with physicians. There was a negligible correlation between total knowledge and personal income ( $r=0.16$ ,  $p=0.002$ ).

The main sources of information on breast cancer and breast cancer early detection methods were the mass media followed by brochures, friends and doctors/ nurses (Fig. 1) There was no significant association between the sources of information and knowledge of breast cancer or breast cancer screening practices ( $p>0.05$ ).

#### *Breast cancer screening behavior*

About 55.6% (230) of teachers reported having performed breast self examination, yet only 19% of them performed BSE on a regular basis. Twenty five percent ( $n=106$ ) of women reported having at least one clinical breast examination (CBE). Of those women over forty, only 13.6% (or 18/119) have had at least one mammogram. Women who performed BSE had significant higher knowledge on breast cancer and screening, compared to those who did not ( $t=5.70$ ,  $p=0.00$ ). Women who reported having a regular visit with their physicians had better performance of BCS ( $P=0.00$ ). There was no significant difference on knowledge between women who performed CBE and mammography and those who did not. There was no significant association between age, family history of breast cancer, marital status, having health insurance, sources of breast cancer information, field of teaching, and teaching experience with BCS behaviors ( $p>0.05$ ).

According to logistic regression analysis, the odds for performing BSE were 0.82 (95% CI 0.69, 0.98) times lower in women who had insufficient knowledge of symptoms of breast cancer, and 0.80 (95% CI 0.80, 0.95) times lower in women who had inadequate knowledge of breast cancer screening methods. None of the knowledge scales were significantly predictive of CBE and mammography performance (Table 5).

Figure 2 illustrates the barriers for participation in breast cancer screening. The women were allowed to state

more than one reason. The most common barriers were inadequate knowledge of breast cancer screening, too busy, forgetfulness, embarrassment, fear of cancer diagnosis and cost.

## **Discussion**

This study found that women with higher levels of knowledge in relation to symptoms and screening demonstrated higher performance rates of BSE. Similarly, in Dundar's study, it was found that more knowledge about breast cancer had a positive effect on performing BSE (Dundar et al., 2006). Hyun's study also revealed that women who are taught to perform BSE have a better level of knowledge about breast cancer (Hyun, 2003). Despite their level of education almost three quarters of the female teachers female teachers in this study were in the low knowledge category about breast cancer symptoms and risk factors, while the majority of study participants knowledge of breast cancer screening methods was low to moderate. On the other hand levels of knowledge about the incidence of breast cancer were more evenly distributed between the three groups.

According to Apinall (1991), more than 90% of breast cancers were found by patients themselves. This fact manifests that women should know about breast cancer symptoms and breast self-examination techniques for early detection of breast cancer. Also, if teachers are not aware about risk factors of breast cancer, they can not change their lifestyle risk factors and decrease modifiable risk factors and actively prevent breast cancer. In addition, as 40% of the female teachers had low knowledge of breast cancer screening methods, it is understandable why breast cancer screening behaviors are low among Malaysian females, this also suggested that inadequate knowledge might be one of the main reasons for the delay of breast cancer detection in Malaysia (Hisham and Yip, 2003). Similarly a study done by Lee et al (2000) in Korea showed that knowledge of the nature of breast cancer and what age to initiate breast cancer screening were reported as the lowest knowledge items. Because of the important role that teachers play in educating young women, they should be encouraged and motivated to increase their own knowledge on breast cancer screening.

Our findings show that the media provide the most important source of information on breast cancer and breast cancer screening. Similarly, media-led health education intervention can successfully promote recognition of screening tests for breast cancers in minority ethnic groups (Jenkins et al., 1999; Im et al., 2004). Perhaps increased media exposure, for example, women's lifestyle programs on television or women's magazines, may have accounted for this becoming the main source of information on breast cancer. Other studies have suggested that raising the awareness of appropriate cancer management through health education by doctors and nurses (Seow et al., 1997; Lee et al., 2000) and suitable brochures (Springston and Champion, 2004) may be more effective resources for women.

Our findings show that, teachers had a low rate of breast cancer screening behaviors. Interestingly, of the

55% of women teachers who reported BSE, only 19% of women performed BSE monthly. The literature on the effectiveness of BSE as a means for detecting breast cancer has been somewhat controversial (Ministry of Health, Malaysia, 2002; Smith et al., 2003; Franco et al., 2006). However the American Cancer Society (Smith et al., 2003) and the Malaysian Clinical Practices Guidelines (Ministry of Health, Malaysia, 2002) encourage women to be aware of how their breasts look and feel so that they will be able to recognize any changes and promptly report them to their clinicians. In order to achieve this goal, women need to be taught to practice BSE competently with the recommended frequency.

In the present study, 25% of women have had a CBE. Similarly, Dundar's study found that 18.4% of women in rural areas in Turkey had a CBE (2006). In the study by Ho et al (2005), the annual CBE percentage was 45% in educated women. Wu et al (2006) study showed 59% of educated Asian immigrants, living in the US performed CBE annually. A large number of illiterate women (20.1%) living in a rural areas in Dundar's study may be the reason for the lower performance of CBE rates than in our study. Although the rates of performing CBE in the Ho and Wu studies were higher than ours, these differences may be due to the free screening programs, and more community educational programs in the US.

With regard to mammography, only 13.6% of women above 40 years had undergone it, which was higher than in Dundar's study (5.5%), but lower than other areas of the world (30% among female teachers in Italy (Pavia et al., 1999), 64% among educated Asian women (Wu et al., 2006), 61.3% among Asian Indian women in the US (Sadler et al., 2002) and 25% among Turkish women in Istanbul, Turkey (Secginli and Nahcivan, 2006). Although the rates of mammography in their study were higher than ours, these differences may be due to the free screening programs and more community education programs in the European countries and US.

Variables such as age, education level, health insurance, history of breast cancer were not shown to be significant factors in the BSE, CBE and mammography practices. Similarly in Jirojwong's study (2003), it was found that socio-demographic variables were not effective for BSE practice. Since independent variables like educational levels, women's job status, income level and type of health insurance were similar among women in this study, they may not be significant for the BSE, CBE and mammography practices.

Similar to previous studies (9,19) the most frequently cited reasons for reluctance to participate in BCS were being busy and forgetfulness. In addition embarrassment, fear of breast cancer diagnosis and cost were other reasons for not undergoing CBE and mammography. Embarrassment during a clinical breast exam (Lee et al., 2000; Im et al., 2004), fear of radiation (Wu et al., 2006) and cost (Risendal et al., 1999) were reported as the main barriers of BCS in other studies. In Malaysia, the delay in presentation of breast cancer can be attributed to social and cultural perception of disease. Fear of breast cancer diagnosis and consequences of breast cancer such as mastectomy was reported as a main reason for seeking

alternative therapy among Malaysian women as well educated women (Hisham and Yip, 2003). These women resorted to alternative treatment, hence, much time was wasted on ineffective treatment resulting in the patient re-presenting again with advanced disease. Furthermore in Malaysia, where an organized population-based screening program is not established, the cost of each mammography is around RM100 (US\$1 = RM\$3.4). A lack of social support and intrinsic cultural beliefs were also postulated to be negative influences on the choice of screening in women (Seow et al., 1997; Yanni Seif and Aziz, 2000; Chan et al., 2002; Hyun, 2003; Im et al., 2004). If the social support network, including employers, colleagues in the workplace, family, and friends, can be improved through an appropriate health education campaign, then it is likely that a more positive attitude toward preventive health care will result.

There are some limitations in our research. Firstly, the findings cannot be generalized beyond the study sample because the study was undertaken in one state and the results may not be generalized to other states of Malaysia. Secondly, all data were self-reported with no objective measures to evaluate the women. However, the results of this study provide some understanding on breast cancer screening knowledge and practices among Malaysian women.

With its increasing incidence, female breast cancer is one of the major health issues confronting Malaysia. While the level of general knowledge appeared to be high, the teachers showed inadequate knowledge in some constructs of the knowledge examined.

The low rates of BSE, CBE and mammography practiced by this group of women are of concern and suggest that increased awareness of these techniques, their value and how they should be carried out is needed. Additionally, information on the relationship between health beliefs and breast cancer screening behaviors may be used to develop targeted information and health education on the benefits of screening. Minimizing barriers to screening behaviors may be effective in convincing women. Interventions need to be focused on the benefits of breast cancer screening behaviors.

Breast cancer afflicts younger women in Malaysia unlike in the western societies where it is a greater problem in menopausal and post menopausal women. However, economic, logistic and cultural barriers are obstacles to a successful screening program. A public health education program targeted at younger women is essential to improve breast cancer prevention and reduce the fear, denial, myths and misconceptions among Malaysian women. Until such a program is in place, the family physician may be called upon to raise awareness and perform opportunistic screening. They need to have information on local women's perceptions and attitudes for management of early breast cancer. Findings from this study may be useful in helping the clinicians become more sensitive to some of the perceptions about breast cancer among their patients. Such knowledge would be useful in facilitating effective communication between physicians and patients.

In addition an effective public screening could be

initiated in primary health care settings making it easily available to all women. Larger studies are needed to confirm present study findings which will help to expand the knowledge base for healthcare providers.

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## References

- American Cancer Society (2005). All about breast cancer overview [Online], Available: <http://www.cancer.org>. [2005, April 16].
- Aspinall V (1991). An effectiveness way to reduce mortality. *Prof Nurse*, **6**, 283-7.
- Barron CR, Houfek JF, Foxall MJ (1997). Coping style, health beliefs, and breast self-examination. *Issues in Mental Health Nursing*, **18**, 331-50.
- Becker MH, Maiman LA (1975). Sociobehavioral determinants of compliance with health and medical care recommendation. *Med Care*, **13**, 10-24.
- Bener A, Honein G, Carter AO, Da'ar Z (2002). The determinants of breast cancer screening behavior: a focus group study of women in the United Arab Emirates. *Oncol Nurs Forum*, **29**, 91-8.
- Bernstein L, Allen M, Anton-Culver H, et al (2002). High breast cancer incidence rate among California teachers: results from the California Teachers Study (United States). *Cancer Cases Control*, **13**, 625-35.
- Champion VL (1993). Instrument refinement for breast cancer screening behaviors. *Nursing Research*; **42** (3):138-143.
- Chan C, Ho SC, Chan SG, et al (2002). Factors affecting uptake of cervical and breast cancer screening among perimenopausal women in Hong Kong. *Hong Kong Med J*, **8**, 334-41.
- Clinical practice guidelines for management of breast cancer. Ministry of Health Malaysia 2002.
- Coogan PF, Clapp RW. Variation in female breast cancer risk by occupation. *Am. J. Ind. Med.* 1996; **30**: 430-437.
- Dundar PE, Ozmen D, Ozturk B, et al (2006). The knowledge and attitudes of breast self examination and mammography in a group of women in a rural area in Western turkey. *BMC Cancer*, **6**, 43-8.
- Franco EL, Franco E, Rohan T (2002). Evidence based policy recommendation on cancer screening and prevention. *Cancer Detect Prevent*, **26**, 350-61.
- Franzcr CM, Mok T, et al (2005). Knowledge, perceptions, and attitudes of Hong Kong Chinese women on screening mammography and early breast cancer management. *Breast J*, **11**, 52-6.
- Galedar N (2001). Determine of knowledge and beliefs of female teachers about breast self examination in Korramabad. *Urmia Medical Journal* :347-348.
- Goldberg MS, Labreche F (1992). Occupational risk factors for female breast cancer. *Nursing Outlook*, **40**, 207-12.
- Hisham AN, Yip CH (2003). Spectrum of breast cancer in Malaysian women: overview. *World J Surg*, **27**, 921-3.
- Ho V, Yamal JM, Atkinson EN, Basen-Engquist K (2005). Predicators of breast and cervical cancer screening in Vietnamese women in Harries county, Houston Texas. *Cancer Nursing*, **28**, 119-29.
- Horn-Ross PL, Hoggatt KJ, West DW (2002). Recent diet and breast cancer risk: the California Teachers Study (United States). *Cancer Cases Control*, **13**, 407-15.
- Hyun L (2003). Breast examination performance among Korean nurses. *J Nurses Staff Develop*, **19**, 81-7.
- Im EO, Park YS, Lee EO, Yun SN (2004). Korean women's attitudes toward breast cancer screening tests. *Int J Nursing Studies*, **41**, 583-9.
- Jarvandi S, Montazeri A, Harirchi I, Kazemnejad A. Beliefs and behaviors of Iranian teachers toward early detection of breast cancer and breast self-examination. *Public Health* 2002; **116**: 245-249
- Jenkins CN, McPhee SJ, Bird JA (1999). Effect of a media-led education campaign on breast and cervical cancer screening among Vietnamese-American women. *Prev Med*, **28**, 395-406.
- Jirojwong SS, MacLennan R, Lennan R (2003). Health beliefs, perceived self-efficacy, and breast self-examination among Thai migrants in Brisbane. *J Adv Nursing*, **41**, 241-9
- Lampton L, Andre T. AIDS knowledge and responsibility. *Youth and Society* 1993; **25** (1):38-62.
- Lauver DR, Kane J, Bodden J, McNeel J, Smith L (1999). Engagement in breast cancer screening behavior. *Oncol Nurs Forum*, **26**, 545-54.
- Lee C, Kim HS, Ham O (2000). Knowledge, practice, and risk of breast cancer among rural women in Korea. *Nursing Hlth Sci*, **2**, 225-30.
- Lim GCC, Yahaya H, Lim TO (Eds) (2003). The first report of the national cancer registry cancer incidence in Malaysia 2002. National Cancer Registry, Malaysia pp:138-140.
- Madanat H, Merrill RM (2002). Breast cancer risk factors and screening awareness among women nurses and teachers in Amman. Jordan. *Cancer Nursing*, **25**, 276-82.
- Narimah A. 1997. Breast Examination. Report of second national health and morbidity survey conference. Organized by Public Health Institute Ministry of Health Malaysia. Hospital Kuala Lumpur:145-148.
- Nunally JC. Psychometric theory. 2nd edition. New York: McGraw Hill, 1978.
- Pavia M, Ricciardi G, Bianco A, Pantisano P (1999). Breast and cervical cancer screening: Knowledge, attitudes and behavior among schoolteachers in Italy. *Eur J Epidemiol*, **15**, 307-11.
- Pearlman DN, Rakowski W, Ehrich B, Clark MA (1996). Breast cancer screening practices among black, Hispanic, and white women: reassessing differences. *Am J Prev Med*, **12**, 327-37.
- Petralia SA, Vena JH (1999). Risk of premenopausal breast cancer and patterns of established breast cancer risk factors among teachers and nurses. *Am J Ind Med*, **35**, 137-141.
- Petro-Nustus W, Mikhail B (2002). Factors associated with breast self examination among Jordanian women. *Pub Health Nurs*, **19**, 263-71.
- Rubin CH, Burnett CA, Halperin WE, et al (1993). Occupation as a risk identifier for breast cancer. *Am J Pub Hlth*, **83**, 1311-15.
- Risendal B, Roe D, DeZapien J, Papenfuss M, Giuliano A (1999). Influence of health care, cost, and culture on breast cancer screening: issues facing urban American Indian women. *Prev Med*, **29**, 501-9.
- Rosenstock IM, Strecher VJ, Becker MH (1988). Social learning theory and health belief model. *Hlth Educ Quart*, **15**, 175-183.

- Sadler GR, Dhanjal SK, Shah NB, et al (2002). Asian Indian: knowledge, attitudes and behaviors toward breast cancer early detection. *Public Health Nursing*, **18**, 357-63.
- Secginli S, Nahcivan NO (2006). Factors associated with breast cancer screening behaviors in a sample of Turkish women: A questionnaire survey. *Int J Nursing Studies*, **43**, 161-71.
- Seow A, Straughan PT, Ng EH, et al (1997). Factors determining acceptability of mammography in an Asian population: a study among women in Singapore. *Cancer Causes Control*, **8**, 771-79.
- Smith RA, Saslow D, Sawyer KM, et al (2003). American cancer society guideline for breast cancer screening: update 2003. *Cancer J Clin*, **53**, 141-69.
- Springston JK, Champion VL (2004). Public relations and cultural aesthetics: designing health brochures. *Public Relations Review*, **30**, 483-91.
- Wagle A, Komorita NI, Zxy-yann JL (1977). Social support and breast self-examination. *Cancer Nursing*, **20**, 42-8.
- World Health Organization. National Cancer Control Program: Policies and Management Guidelines. Geneva, Switzerland: WHO, 2005.
- Wu TY, West MA, Chen YW, Hergert C (2006). Health beliefs and practices related to breast cancer screening in Filipino, Chinese and Asian-Indian women. *Cancer Detect Prevent*, **30**, 58-66.
- Yanni Seif N, Aziz M (2000). Effect of breast self examination training program on knowledge, attitude and practices of a group of working women. *J Egyptian Natl Cancer Inst*, **12**, 105-15.

