

## RESEARCH COMMUNICATION

# Knowledge of and Attitudes toward Breast Self-Examination in Iranian Women: A Multi-Center Study

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### Abstract

**Background:** In Iran, breast cancer is the second most common malignancy among women and diagnosed in advanced stages almost a decade earlier than women living in western countries. **Objective:** To determine the level of knowledge and attitudes toward breast self-examination (BSE) among Iranian women. **Methods:** In a cross-sectional multi-center study, 3,060 women aged between 25 and 54 years attending between July and October 2009 to 11 general health care centers located in 11 cities of Iran, were interviewed to assess their knowledge and attitudes toward BSE. **Results:** Of the total, the data of 3030 were found eligible for analyses. The median (interquartile range [IQR]) age of participants was 40 (14) years; 2687 (88.7%) were married; 1496 (49.4%) women performed BSE, 290 of whom (19.4% of performers and 9.6% of all studied women) did it using a correct method and at an appropriate time. More than three-quarters of performers (n=1141) learned about BSE from a health care provider; 248 (16.6%, 95% confidence interval [CI]: 14.7% to 18.5%) had abnormal findings, 11 (0.7%, 95% CI: 0.3% to 1.2%) of which were malignant. Of 1534 (50.6%) non-performers, 474 (30.9%) did not know how to do BSE; the remaining women did not do BSE for fear of being found positive for cancer or did not care about it. Being a health care provider, married, educated, and knowing of a person with breast cancer was associated with performing BSE. **Conclusions:** The level of BSE practice and knowledge among Iranian women is unsatisfactory. We should emphasize appropriate education of women.

**Keywords:** Breast neoplasms - BSE - mammography - health knowledge - attitudes - practice - Iran

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### Introduction

Breast cancer is the most common cause of cancer-related deaths in women worldwide (Demirkiran et al., 2007). In the World Health Organization (WHO) Eastern Mediterranean Region, the fourth leading cause of death is cancer (2009 Document WHO-EM/NCD/060/E/7.09/400). In the Middle East, the incidence of breast cancer is increasing (Abdel Hadi, 2000). In Iran, breast cancer is the second most common malignancy among women (Harirchi et al., 2004).

Detection of breast cancer at an advanced stage, results in a poor outcome. In many developing countries such as Iran and Turkey, breast cancer is diagnosed in advanced stages of the disease and at relatively younger ages (about 10 years earlier) than in women residing in western countries (Kahan et al., 1997; Elmore et al., 2005; Harirchi et al., 2005; Mousavi et al., 2007; Ertem et al., 2009; Sadjadi et al., 2009; Kolahdoozan et al., 2010). If the malignancy is found early and cured effectively, the

patients would have longer live and spend lower cost (2009 Document WHO-EM/NCD/060/E/7.09/400).

Establishing population-based screening programs including periodical mammography, breast examination by a trained medical staff and monthly breast self-examination (BSE) is useful to detect breast cancer at an early stage (2009 Document WHO-EM/NCD/060/E/7.09/400). BSE has once been considered as one of the well-accepted breast cancer screening modalities. Nonetheless, some researchers have seriously questioned the usefulness of BSE after a number of influential organizations such as the Canadian Task Force on Preventive Health Care, downgraded their BSE recommendation (Kearney et al., 2006). However, recommendations against the effectiveness of BSE were largely based on the results of three trials which had some methodological weakness that limited their ability to evaluate the effectiveness of BSE (Ellman et al., 1993; Semiglazov et al., 1993; 1999; Thomas et al., 2002), and therefore faced some resistance (Del Giudice et al., 2005) so that some researchers still

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believe that the evidence against performing BSE is not conclusive yet (Epstein, 2003; Manasciewicz, 2003), and considering that most women still detect their own breast cancer, it is a somewhat premature to conclude that BSE is not effective (Kearney et al., 2006).

Information regarding the practice of BSE and determining public knowledge and attitudes toward performing BSE can help us in the establishment of cancer control programs and better planning of patient education (Luther et al., 1987). So far, many studies have been conducted on the knowledge, attitudes and practice of BSE in different ethnic groups which revealed variable results (Kudadjie-Gyamfi et al., 2005; Mitchell et al., 2005; Dundar et al., 2006; Freitas et al., 2006; Jahan et al., 2006; Demirkiran et al., 2007; Lepecka-Klusek et al., 2007; Nahcivan et al., 2007; Soyer et al., 2007). In a recent study, we found that almost half of the 300 studied women from Shiraz, southern Iran, did not perform BSE, that almost all of those who did perform BSE did it incorrectly, and that a lack of knowledge on how to perform BSE was the main reason why most non-performers did not examine themselves (Simi et al., 2009). Since our previous findings reflect a poor practice and knowledge of BSE among the studied women, we conducted this multi-center study to obtain a better view of the level of BSE practice knowledge and the factors influencing the knowledge and attitudes of BSE among Iranian women.

## Materials and Methods

### Study design, setting

The study design was similar to a previous study we conducted in Shiraz, southern Iran (Simi et al., 2009). The National Iranian Oil Company (NIOC) Health Organization, an independent health care provider, has 20 health care branches distributed in Iran. Some of these branches are well-equipped and have well-designed hospitals. Some are dayclinics with limited equipments enough to perform minor surgeries and admission for

not more than two days, and others are polyclinics. The patients attending these centers are mostly employees of NIOC and their family members and receive health care services free of charge according to the NIOC health insurance policy. The patients, therefore, range in age from children to old people.

In a cross-sectional multi-center descriptive study, 3060 women aged between 25 and 54 years attending 11 health care centers of the NIOC Health Organization located in 11 cities geographically distributed throughout Iran were studied. The participants were interviewed by a trained nurse or midwife to assess their knowledge and attitudes toward BSE.

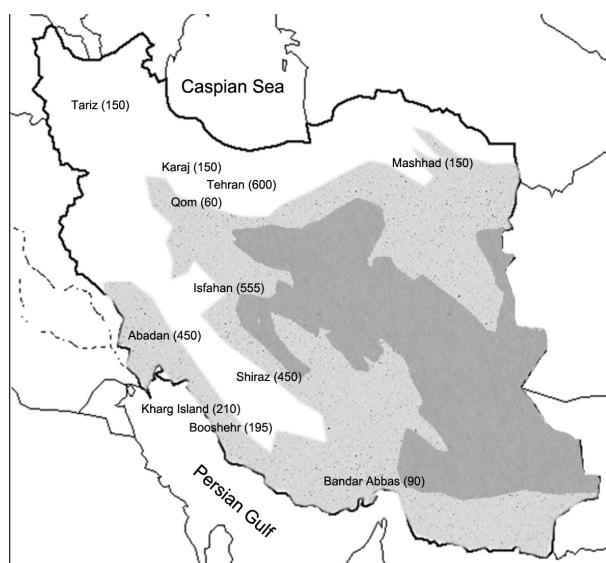
Using a computer random number generator, we selected 11 of 20 centers from different parts of Iran to obtain an acceptable geographic distribution of the studied sample. We used a stratified random sampling method. The sample size selected from each center was calculated based on the number of population that center provided health care service to them. The centers included in this study were Abadan, Bandar Abbas, Booshehr, Isfahan, Karaj, Kharg Island, Mashhad, Qom, Shiraz, Tabriz, and Tehran. A large portion of Iran is desert with very low population density. The study centers were selected so that we have an acceptable geographic distribution throughout the inhabited regions of the country (Figure 1). The total population receiving health care services from these centers was 274 200 of which 3060 women were selected. The sample size studied in each center is shown in Figure 1.

### Data collection

Ten nurses and midwives were invited from the 10 centers (all but Shiraz). They were informed of the study design and its objectives, and trained for completing the questionnaire in a full-day meeting by two physicians and a nurse who had been previously trained for the job and collected data from Shiraz. Their training was continued for two more weeks through telephone conversation and case simulation. All of these interviewers were trained to ask the questions, record the participant's responses in a data collection sheet, and perform BSE correctly. Two physicians examined the level of proficiency of the trained interviewers after the training course and approved that they could perform the interview correctly. One of the physicians and the trainer nurse were supervising the process and if any question arose, they were available to interviewers throughout the data collection period.

### Inclusion and exclusion criteria

All women attending the 11 health care centers (Figure 1), for any reason, who aged 25–54 years and who agreed to enter this study after being informed of the study design and objectives, were included in this study. Those participants who had undergone breast surgery only for cosmetic reasons, who were currently pregnant or were breastfeeding were excluded from the study. In the said conditions, BSE has little or no value, since the breast tissue is notably changed after either surgery or by prolonged exposure to hormones (pregnancy and breastfeeding).



**Figure 1. Locations of 11 Cities where Samples were Taken (sizes) - Deserts with Very Low Population Density are Shaded**

The included participants were then categorized into three age groups: 25–34, 35–44 and 45–54 years. These three age groups were of equal size. We recruited participants until the sample size for each group reached the desired size designed for each center.

The questions asked from each woman were very simple to understand, had no technical terms, and addressed the age of the participant; her marital status; level of education; whether she knows a relative/friend who had had breast cancer; whether the participant performs BSE; if yes, how long and with what frequency the participant performs BSE; whether she encountered something abnormal in the examination; and the source of information from which she learned about performing BSE. Those participants who performed BSE were asked to perform it in front of the interviewer (nurse or midwife) so that she could determine whether they do it correctly or not. They were also asked if they had found any findings during BSE. If the participant did not perform BSE, she was asked for the reasons. The women studied were then categorized into two groups: “performers” (women who performed BSE at least occasionally) and “non-performers” (women who had never performed BSE). They were also categorized into two groups of “Medics” (physicians, nurses, and midwives) and “non-Medics” (others).

#### *Sampling technique*

To select the women in each of the 11 studied health care centers, the interviewer used a convenient sampling method. The interviewer enumerated the seats in the patients' waiting room and all women who fulfilled the inclusion criteria and who sat on seats with certain numbers pre-determined by a computer random number generator, were selected and asked to participate in the study. Selection of patients was done at various times of the day and days of a week. Sampling was started on July 22, 2009 in all the 11 studied centers. We asked all the centers to complete the data collection before October 22, 2009. Progress of the work was monitored regularly by asking the centers to send their data to Shiraz every month.

#### *Ethics approval*

The study design and objectives were explained to each participant. We reassured all participants that the collected data would remain confidential and their identity would be kept anonymous. Each participant gave consent to use their data in the way explained. The data were coded and the only link between the computer records and identifiable participants' records (which were kept in a safe place) was a unique identification number. The ethical aspects of this study were evaluated and approved by the NIOC Health Organization Institutional Review Board.

#### *Statistical analysis*

Data recorded on the datasheet in each of the 11 studied NIOC health care centers were then sent to Shiraz where the data were pooled and analyzed. The data from each center were examined, categorized, coded and analyzed

by SPSS® Statistics version 17 for Windows®. When there was a discrepancy in the categorization of a response, the correct category was chosen following discussion with the interviewer who provided the data. Records with contradicting responses which could not be resolved, were omitted from the analysis. The records were also checked for duplication as one person might have been interviewed in two or more centers during her travel. Moreover, they were checked for correct categorization in their age group by the interviewer.

The normality of distribution of continuous variables was tested by one sample Kolmogorov-Smirnov test. Continuous variables with normal distribution were presented as mean±SD; non-normally distributed variables were reported as median (interquartile range [IQR]). Means of two continuous normally distributed variables were compared by independent samples Student's t test. Mann-Whitney U test and Kruskal-Wallis test were used respectively to compare means of two and three or more groups of variables not normally distributed. The frequencies of categorical variables were compared using Pearson  $\chi^2$  or Fisher's exact test, when appropriate. A p value <0.05 was considered statistically significant.

## **Results**

#### *Basic characteristics of participants*

Of the 3060 studied women, 16 (0.52%) were excluded from the study for unresolved discrepancy in their responses; 14 (0.46%) had undergone breast surgery for only cosmetic purposes and were also excluded from the study, leaving 3030 women for the final analyses. Some of participants were misclassified in their age groups by interviewers which reclassified during data cleaning. Of 3030 studied women 2687 (88.7%) were married. While more than 95% of women aged 45–54 years were married, among women aged 25–34 years, the rate varied from 60.7% in Shiraz to 96% in Booshehr. Age and the number of years each woman had been educated were not normally distributed (one sample Kolmogorov-Smirnov test;  $p < 0.001$  for both variables). Overall, the median (IQR) age was 40 (14) years and the median (IQR) period of education was 12 (7) years. The median (IQR) period of education for 25–34-year-old women was 14 (4) years in Shiraz and 8 (7) for Booshehr. One thousand three-hundred and forty-six (44.4%) participants knew one of their relatives/friends who had had breast cancer.

#### *Characteristics of performers*

One thousand four-hundred and ninety-six (49.4%) women performed BSE (Table 1). The rate varied from a minimum of 20.0% in Booshehr to a maximum of 72% in Bandar Abbas ( $p < 0.001$ ). Almost three-quarters of performers (1082 out of 1496) used the correct method of BSE (Table 1). Seventy-five (5.0%), 45 (3.0%), and 220 (14.7%) performers did BSE before, during, and after their menstruation, respectively. In 827 (55.4%) performers, no association was reported between the time of BSE and menstruation. Only 327 (21.9%) performers did BSE correctly on the last day of their menstrual cycle. Two-hundred and ninety (19.4%) performers (9.6% of all



**Table 1. Data for Breast Self-examination (BSE) Performance in Different Cities in Iran**

BSE	Abadan	Booshehr			Karaj	Mashhad			Shiraz	Tehran			p
	Bandar Abbas		Isfahan			Kharg Island		Qom		Tabriz		All	value
Performers	196 (44)	64 (73)	39 (20)	349 (63)	99 (66)	104 (51)	71 (47)	29 (48)	257 (57)	74 (50)	214 (37)	1496 (49)	<0.001
Correct*	186 (98)	41 (65)	29 (74)	305 (88)	82 (83)	68 (67)	54 (77)	21 (72)	135 (53)	49 (68)	112 (54)	1082 (74)	<0.001
Performed (relative to the menstrual cycle):													
Before	23 (12)	6 (9.0)	0 (0.0)	1 (0.3)	5 (5.0)	8 (7.7)	1 (1.0)	0 (0.0)	14 (5.5)	0 (0)	17 (8.0)	75 (5.0)	<0.001
During	4 (2.0)	3 (.05)	5 (13)	4 (1.1)	2 (2.0)	3 (2.9)	1 (1.0)	2 (7.0)	11 (4.3)	1 (1)	9 (4.2)	45 (3.0)	0.013
After	63 (32)	12 (19)	11 (28)	66 (19)	9 (9)	22 (21)	2 (3.0)	1 (3.0)	15 (5.9)	3 (4)	16 (7.5)	220 (15)	<0.001
Independent	105 (54)	43 (67)	22 (56)	97 (28)	61 (62)	60 (58)	51 (72)	17 (59)	193 (75)	38 (51)	142 (66)	827 (55)	<0.001
Appropriately†	1 (0.5)	0 (0.0)	1 (3.0)	181 (52)	22 (22)	11 (11)	16 (23)	9 (31)	24 (9.4)	32 (43)	30 (14)	327 (22)	<0.001
Performed using a correct method and at an appropriate time													
	1 (0.5)	0 (0.0)	0 (0.0)	175 (50)	20 (20)	10 (9.6)	14 (20)	8 (28)	15 (5.9)	24 (32)	23 (11)	290 (19)	<0.001
Knowledge from													
Staff††	171 (87)	49 (77)	36 (92)	328 (94)	75 (76)	83 (80)	59 (83)	20 (69)	145 (56)	48 (65)	127 (59)	1141 (76)	<0.001
Media	50 (26)	15 (23)	9 (23)	63 (18)	20 (20)	39 (38)	23 (32)	12 (41)	67 (26)	42 (57)	78 (36)	418 (28)	<0.001
TV, radio	22 (11)	7 (11)	3 (8)	35 (10)	9 (9.0)	26 (25)	10 (14)	7 (24)	47 (18)	29 (39)	57 (27)	252 (17)	<0.001
Books	28 (14)	9 (14)	7 (18)	32 (9.2)	12 (12)	17 (16)	14 (20)	6 (21)	24 (9.3)	22 (30)	35 (16)	206 (14)	<0.001
Friends	11 (5.6)	7 (11)	2 (5)	10 (2.9)	17 (17)	4 (3.8)	1 (1)	6 (21)	56 (22)	7 (10)	28 (13)	147 (9.8)	<0.001
Reasons for not performing BSE													
Not know how	93 (37)	9 (38)	85 (55)	63 (31)	14 (27)	34 (33)	17 (22)	9 (29)	59 (30.6)	18 (24)	73 (20)	474 (31)	<0.001
Unnecessary	91 (36)	11 (46)	47 (30)	24 (12)	10 (20)	39 (38)	12 (15)	13 (42)	76 (39)	32 (43)	214 (58)	569 (37)	<0.001
Not thought	56 (22)	3 (13)	20 (13)	99 (49)	21 (41)	21 (21)	39 (49)	6 (19)	50 (26)	15 (20)	69 (19)	399 (26)	<0.001
Afraid positive	6 (2.4)	0 (0)	3 (1.9)	15 (7.4)	6 (12)	8 (7.8)	11 (14)	3 (10)	8 (4.1)	9 (12)	10 (2.7)	79 (5.1)	<0.001
No reason	5 (2.0)	1 (4.0)	1 (0.6)	2 (1.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0)	4 (1.1)	13 (0.8)	0.367

\*Not necessarily at an appropriate time; †on the last day of the cycle, not necessarily using a correct method; ††Physician, nurse, midwife

women studied) did BSE using a correct method and at an appropriate time. More than three-quarters of performers learned about BSE from a Medic, almost a quarter learned it from the media (TV, radio, books, journals, pamphlets, etc) and a tenth learned BSE from their relatives and friends. Both the period when each performer did BSE and the interval between two successive examinations were not normally distributed (one sample Kolmogorov-Smirnov test;  $p < 0.001$  for both variables). Overall, performers did BSE for a median (IQR) of 4 (5) years; the median (IQR) interval between examinations was 4 (9) weeks.

#### Findings of performers

Of 1496 performers, 248 (16.6%, 95% confidence interval [CI] 14.7% to 18.5%) found an abnormal examination. Pathologic study of lesions revealed abnormal examination in 82 (5.5%, 95% CI 4.3% to 6.6%) patients; 11 (0.7%, 95% CI 0.3% to 1.2%) were malignant and 71 (4.7%, 95% CI 3.7% to 5.8%) were benign lesions (Table 2). Fifty-five (67%) of the 82 patients used the correct method of BSE, although the correlation between using the correct method of examination and finding an abnormal lesion was not significant ( $p = 0.078$ ). No association was also found between the findings and time of BSE ( $p = 0.574$ ). The most common reported pathologic findings were fibrocystic disease, fibroadenoma, lipoma, abscess, ductal carcinoma, lobular carcinoma, adenocarcinoma, and Paget's disease.

#### Characteristics of non-performers

Of the studied women, 1534 (50.6%) did not perform BSE, of whom 474 (30.9%) did not so for lack of knowledge, 968 (63.1%) did not care, and 79 (5.1%) did not perform BSE for fear of being found positive for cancer. Thirteen (0.8%) participants provided no reasons.

#### Associated factors

There was a significant ( $p < 0.001$ ) difference between

the educational level among the three age groups studied; while more than half (53.8%) of women aged 35–44 years performed BSE, less than half of other studied women did so.

Although the association between performing BSE and age was not significant in some cities, overall, it was significant ( $p = 0.001$ ). More than half (53.3%) of those with 12 years or more education performed BSE while 43.5% of less educated women were performers ( $p < 0.001$ ). Education also affected how well people did BSE; while 76.8% of women educated 12 years or more did BSE correctly, 67.4% of less educated women did so ( $p < 0.001$ ).

More than half (50.7%) of the married and 39.5% of unmarried women were performers ( $p < 0.001$ ). Knowing a person with breast cancer affects performing BSE; 56.3% of those who knew a person with cancer and 43.9% of those who did not were performers ( $p < 0.001$ ).

Source of information from which participants learned BSE, significantly affects the way they performed it; 79.5% of those who had learned the procedure from a Medic vs 54.0% of those who had learned it from a non-Medic performed BSE correctly ( $p < 0.001$ ). Learning from neither media ( $p = 0.384$ ) nor book ( $p = 0.112$ ) affects the likelihood that performers did BSE correctly. On the other hand, learning the procedure from relatives was associated with doing the procedure incorrectly; 47.3% of those who learned BSE from their relatives did it correctly, while 76.6% of those who learned BSE from another source did so ( $p < 0.001$ ).

Seventy-four percent of Medics and 48.5% of non-Medics performed BSE ( $p < 0.001$ ). While 91.8% of Medics who performed BSE did it correctly, 72.5% of non-Medics who performed BSE did so ( $p < 0.001$ ). Women in those three major cities (Abadan, Shiraz, and Tehran) where less than 65% of the 25–34-year-old women married, were here established to be more likely to find an abnormal BSE.

**Table 2. Abnormal Findings Reported by Performers and by Pathology**

City	Participants	Pathology	Malignant	Benign
Abadan	27 (13.8)	8 (4.1)	1	7
Bandar Abbas	18 (28.0)	8 (13)	1	7
Booshehr	2 (5.0)	1 (3)	1	0
Isfahan	34 (9.7)	1 (0.3)	1	0
Karaj	25 (25.0)	5 (5)	1	4
Kharg Island	16 (15.4)	4 (3.8)	1	3
Mashhad	2 (2.8)	2 (2.8)	0	2
Qom	5 (17.0)	3 (10)	0	3
Shiraz	54 (21.1)	24 (9.4)	2	22
Tabriz	15 (20.0)	1 (1)	0	1
Tehran	50 (23.5)	25 (11.7)	3	22
All	248 (16.6)	82 (5.5)	11	71
p value	<0.001	<0.001	0.179	0.179

## Discussion

We found that almost half of the studied women performed BSE, that three-quarters of performers used a correct method of examination, and that almost one-fifth of performers did BSE using a correct method and at an appropriate time (Table 3). Being a Medic, married, educated, and knowing of a person with breast cancer was associated with performing BSE. Learning BSE from a Medic and having a higher education level were associated with doing BSE correctly.

The prevalence rate of performers had a wide variation (range: 20% to 72%) among the studied cities. We usually observed a higher performance rate in larger cities compared to smaller cities; in larger cities women are more educated and usually married at later ages. Mashhad, a large city in northeastern Iran, a place of pilgrimage and residence of a variety of ethnicities, is an exception among large cities with 94% of its 25–34-year-old women married. In large cities various educational resources, particularly Medics are readily available and women can learn about BSE much easier than those who live in smaller cities. Marriage also increases the likelihood of performing BSE, perhaps through information married women learned during pre-marital obligatory health courses. These courses include information on women health, sexually transmissible diseases, contraceptive methods, common cancers, etc.

Performance was associated with age. Those women aged 35–44 years did perform BSE more frequently than other studied women. Although younger women have a higher education level and thus are expected to have a higher information about breast cancer and BSE, many of them are not married, a variable which as explained earlier has a negative association with performing BSE. The younger women in our study had a higher level of education as compared to older women. This observation merely reflects the increasing trend of involvement of women in higher education over the recent decades in Iran. Nevertheless, this education was not very effective in increasing the awareness of these young women about breast cancer, probably because it was not designed to provide useful health information about this fatal condition. The knowledge of young educated women

about breast cancer and BSE was not very higher than the older less educated women. This underlines the importance of basic health education at all age levels.

Most (94%) of non-performers did not either know how to do BSE, think or care about it. Another 5% did not do BSE for fear of being found positive for cancer, a belief which also in most instances originates from ignorance (Table 6). Mashhad with its diverse ethnic population had the highest rate (14%) of people who did not perform BSE for fear of being found positive for cancer. These findings are in keeping with other reports which concluded that ignorance and fear were the main obstacles to performing BSE (Montazeri et al., 2008; Simi et al., 2009; Piperaki et al., 2010).

All these underline the importance of education. Reports from developed countries where basic health education is better established than developing countries, show that the performance rate is much better than that reported from developing nations. The authors of a study found that 82.9% of Polish women performed BSE and concluded that the rate was unsatisfactory (Lepecka-Klusek et al., 2007). On the other hand, only 21% of Greek women and only 17.4% of Yemeni female university students performed BSE monthly (Ahmed, 2010; Piperaki et al., 2010). Comparing the performance rate in Greek, Yemeni and our studied women (49.3%) with that of the Polish report, indicates how Polish women are much more aware of the danger which is probably attributed to the better basic health education they receive.

No doubt, education is important in performance of BSE. We found that learning BSE from Medics are the most important and reliable way to learn about and doing BSE correctly. This is in line with other reports which showed that the most common source of information for women who performed BSE was health professionals (Piperaki et al., 2010; Simi et al., 2009). On the other hand, we found that learning BSE from unreliable sources, say relatives (non-health professionals), was associated with doing the procedure incorrectly. We found that almost three-quarters of Medics performed BSE and more than 90% of whom did it correctly. This is in keeping with other reports. A high proportion (84.4%) of the nurses in the United Arab Emirates performed BSE (Sreedharan et al., 2010). Like what we found, in that study, marriage was also important so that 87.0% of married and 78.3% of single nurses were performers.

Of 1496 performers, 248 (16.6%) found an abnormal examination during a median period of four years. Further studies revealed a pathology in almost one-third ( $n=82$ ) of them, 11 of whom had malignant lesions (Table 5). This indicates that relying on BSE alone to detect breast cancer provides a prevalence rate of 0.7% (95% CI 0.3% to 1.2%) which is in keeping with other previous reports (Hofvind, 2007; Simi et al., 2009). In a large randomized controlled trial conducted in Shanghai, 331 out of 133,375 women who were taught to perform BSE found benign lesions during six years—from 1989 through 1994 (Thomas et al., 1997). Assuming that the detection rate had not changed significantly over the six years, we can conclude that the detection rate during four years would be 0.17% (95% CI 0.14% to 0.19%), which is less than one-fourth of the

rate we observed in our subjects (0.7%). The discrepancy between the results of these two studies suggests that we should not generalize to all women the findings of the Shanghai study—which finally concluded that teaching women how to examine their breasts does not lead to a reduction in mortality due to breast cancer compared with no screening at all (Thomas et al., 2002).

Women in those cities (Abadan, Shiraz, and Tehran) where less than 65% of 25–34-year-old women married (Table 2), were more likely to find an abnormal BSE (Table 5). Those who marry earlier and give birth to more children are at lower risk of developing breast cancer. Lower marriage age is normally seen in smaller cities and religious communities. However, urbanization, level of education as well as other factors such as earlier age at marriage and first pregnancy, greater number of pregnancies, and longer duration of breast-feeding—all of which are more frequently seen in smaller cities and among religious communities—have also been noticed by other researchers as factors affecting the risk of breast cancer (Robert et al., 2004).

Although 55 (67%) of the 82 women who found a mass did BSE correctly, no statistically significant association was found between finding a mass and the time of BSE or the correctness of the examination technique used. Therefore, we conclude that “any BSE” is better than “no BSE.” However, the efficacy of BSE is questioned during the past decade by several influential bodies such as the Canadian Task Force on Preventive Health Care (Kearney et al., 2006). In a recent report, the US Preventive Services Task Force has also questioned the usefulness of clinical breast examination and stated that there is insufficient evidence to recommend for or against its performance (Gregory et al., 2010). A Cochrane’s review also found no beneficial effect of screening by BSE; the authors concluded that at present, screening by BSE or physical examination cannot be recommended (Kösters et al.). However, the epidemiology of breast cancer is different in various parts of the world. Breast cancer is by far the most common cancer in the WHO Eastern Mediterranean Region and has an increasing trend in its incidence (2009 Document WHO-EM/NCD/060/E/7.09/400). The highest frequency of breast cancer among Iranian women was observed in the 40–49-year-old women (Harirchi et al., 2004). Similar observations have also been made in a number of other countries such as Pakistan and Nigeria, to name only a few countries (Akpo et al., 2010; Malik, 2002). Although the reason for which the age at diagnosis of breast cancer is almost 10 years earlier than that reported in western communities, might be genetic, occupational and/or environmental (B Mester et al., 2010; Fattahi et al., 2009; Yadollahie, 2010), it is not still well understood. Furthermore, diagnosis of breast cancer in Asia is usually made in the late stages of the disease (Alagaratnam, 1995). The vast majority of breast cancers in Iran are diagnosed in advanced stages with large tumor sizes. In a recent study, 76.8% of cases had a tumor size >2 cm (T2 or higher) and 65.3% had positive lymph nodes (Harirchi et al., 2011).

Although mammography is not a perfect tool, it remains the best diagnostic modality for early detection of breast cancer. However, routine mammography as

a screening test for early detection of breast cancer should not be introduced in countries where resources are not available to cover at least 70% of women above age 50 years (2009 Document WHO-EM/NCD/060/E/7.09/400). Mammography requires high tech expensive equipment, special films with dedicated processing, and well-trained radiologists (2009 Document WHO-EM/NCD/060/E/7.09/400). However, breast cancer screening programs based on mammography are not affordable and feasible in most of the countries of the Eastern Mediterranean Region given the low number of skilled radiologists and radiographers, small number of mammography machines, high cost per life-year saved, lack of organized systems for quality control, and the current levels of per capita health expenditure.

Iranian women, many of whom live in small cities, have limited access to clinical breast examination and mammography which is mostly available in large cities. Furthermore, a recent study revealed that even a significant proportion of women present with breast cancer within one year of a normal mammogram and concluded that BSE and clinical breast examination should be used for screening of breast cancer (Haakinson et al., 2010).

Since most of the evidence against performing BSE came from studies which cannot be generalized to all populations (Jones, 2008), considering that breast cancer is more likely to occur at a younger age in Iranian women, and that the higher density of breast tissue in young women makes mammography more painful and more difficult to interpret, we have to look for other screening modalities. Although BSE may be abandoned in some developed countries because of their access to advanced medical facilities, like some other researchers (Anderson et al., 2011), we believe that BSE is still of great value in low- and middle-resource countries where not all women have access to mammography. In the meantime, we have to emphasize on education of women. If women are educated and encouraged to do BSE correctly, they could compare how their breasts are felt periodically (particularly if they examine themselves on a certain time, say on the last day of the menstrual cycle) and ultimately can pick up any changes in their breasts. It seems that the most efficient way of education is through face to face education by Medics.

Considering the high prevalence of breast cancer, particularly among young women in the region, large scale cohort studies or controlled clinical trials to evaluate the efficacy of BSE in the region should be conducted.

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