

## The Impact of Female Students' Breast Self-Examination training on their Mothers' Awareness

Elieh Abasi (MSc)<sup>1\*</sup>, Homaira Tahmasebi (MSc)<sup>2</sup>, Mandana Zafari (PhD)<sup>3</sup>, Maryam Tofigi (MSc)<sup>3</sup>, Sogra Hasani (MSc)<sup>2</sup>

<sup>1</sup> Faculty of Medical Sciences, Azad University, Sari Branch, Sari, Iran

<sup>2</sup> Department of Nursing, Islamic Azad University, Sari Branch, Sari, Iran

<sup>3</sup> Department of Midwifery, Islamic Azad University, Sari Branch, Sari, Iran

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### ABSTRACT

**Background & aim:** Breast cancer is the most common cancer in women, which its early diagnosis is of paramount importance for the prevention of its associated mortality and morbidity. Breast self-examination (BSE) is one of the methods for the early detection of breast cancer. Education plays an important role in increasing BSE practice. Regarding this, the present study was conducted to measure the impact of BSE training to female students on their mothers' awareness.

**Methods:** This quasi-experimental study was conducted on 100 university students and their mothers in Sari, Iran, in 2015. After educating the students about BSE, they were asked to train their mothers in this regard. The data were collected before and one month after training, using demographic, BSE attitude assessment, and BSE questionnaires. Data analysis was performed in SPSS software (version 17) using descriptive statistics, Chi-square test, t-test, and Fisher's exact test.

**Results:** The results of the independent t-test revealed a significant difference between the two groups in terms of knowledge at the post-training stage ( $P=0.000$ ). Furthermore, the two groups had significant mean differences in the knowledge scores obtained before and after the training ( $P<0.001$ ). Also, the intervention group showed a significant difference in their knowledge scores at the post-training stage, compared to that at the pre-training phase ( $P=0.000$ ). However, regarding the control group, this variable was not significantly different between the two stages ( $P=0.29$ ).

**Conclusion:** As the findings indicated, BSE education could positively affect mother's knowledge in this regard. Therefore, it is suggested to use this training method for promoting mothers' knowledge about BSE.

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## Introduction

Breast cancer is the most common cancer and leading cause of death among women (1). This cancer accounts for almost one-third of all cancers in females (2). According to an investigation performed by New York Cancer Center, the incidence of breast cancer has been on a growing trend among various age groups since mid-1940 (3). Based on the cancer records obtained in the last few decades in Iran, breast

cancer is the most common cancer among women in this country (3). The average age of the Iranian women with breast cancer is 48.8 with the highest malignancy in women aged 40-49 years (4).

Certain factors are effective in breast cancer, such as early menarche, late menopause, *BRCA1* and *BRCA2* genes, personal and family history of breast cancer, and hormone consumption (2).

\* *Corresponding author:* Elieh Abasi, Faculty of Medical Sciences, Azad University, Sari Branch, Sari, Iran. Tel: +989112562059; Email: elieh\_abasi@yahoo.com

Given that the risk factors for breast cancer cannot be intervened, the main emphasis of breast cancer prevention programs focuses on early detection and screening of this cancer, which cause the reduction of its associated mortality rate (5).

Breast self-examination (BSE), mammography, and clinical breast examination are effective methods for the early detection of breast cancer (6). The early detection of breast cancer through screening programs is a suitable strategy to control the disease and reduce its associated mortality rate. Although BSE is a controversial issue, it is an important screening method in breast cancer diagnosis (6). Evidence shows that women who properly perform BSE monthly are more likely to detect the breast lumps in the early stages of development.

Early detection can positively affect the therapeutic process, resulting in a higher survival rate (1). The BSE is a simple, private, safe, and free of charge method without any need to specific screening equipment. If properly performed, BSE enables one to detect the palpable masses in early stages. Women have low levels of knowledge and skills concerning BSE in both developed countries and developing ones, including Iran (4).

Accordingly, the results of a study conducted on the students of Tarbiat Moallem University, Iran, demonstrated that 94% of the students had poor skills in performing BSE (7). In another study, only 21% of women attending public health centers were reported to have ever practiced BSE (1). Despite the recognized efficacy of BSE, there are limited reports about this approach.

Unawareness of the proper administration of this examination, lack of time, and fear of finding a mass are widely known as the main reasons accounting for the non-implementation of BSE. Training is one of the methods to increase the practice of BSE (8). Opinions vary toward BSE as one of the earliest methods to detect breast cancer. In this regard, Weiss indicated that BSE does not reduce the mortality associated with breast cancer; however, it can increase the benign biopsy (9).

On the other hand, other researchers have supported BSE and indicated that it helps women to know more about the natural

structure of the breast to detect any changes at early stages (10-12). The BSE is still considered an important method by numerous specialists and associations (10). Furthermore, the knowledge of breast cancer is of paramount importance in promoting BSE practice (13). Early detection and timely treatment are the most important factors in reducing morbidity and mortality due to breast cancer. Regarding this, the methods that can increase women's awareness in this regard should be given special attention to promote the health of women in the community and disseminate positive health behaviors.

Training of BSE has been implemented for different groups and in different ways (4, 11, 14). In a study performed in Turkey, online education was considered as an effective method for teaching BSE to women (15). To the best of our knowledge, no study has investigated the effect of BSE training by daughters to mothers in Iran. Therefore, this study aimed to determine the effect of BSE training by female students on the awareness of their mothers. In case of effectiveness, this method can be used to increase women's awareness about the timely detection of breast cancer, thereby reducing the associated mortality rate.

## Materials and Methods

This quasi-experimental study was conducted on 100 mothers of nursing and midwifery students in Sari, Iran, in 2015. Based on the sample size formula, 50 people were included in each group. In order to compensate the sample loss, 120 mothers were selected for two groups. The inclusion criteria for mothers were: 1) Iranian nationality, 2) Sari residence, 3) literacy, 4) no former training concerning BSE, 5) no education or employment in one of the medical science courses, and 6) no history of any illnesses or breast cancer.

The data were collected using a demographic form (16 items), BSE assessment questionnaire (20 items), and BSE attitude assessment questionnaire. The validity of the demographic form was determined using the content validity. Furthermore, the reliability of the demographic form was investigated by means of the test-retest method. The validity of the attitude and

knowledge questionnaire was examined by Akbarzadeh et al. (2008) (16). In the current study, to determine the reliability of this questionnaire, it was completed by the researcher for ten women within a week interval. The reliability was confirmed after evaluating the inter-item correlation ( $r=0.9$ ). The reliability of the knowledge and attitude questionnaire was evaluated by test-retest method as 0.75 and 0.71, respectively.

A total of 120 volunteer students were selected after obtaining their informed consent, and then randomly divided into two groups of intervention and control. Initially, both groups were asked to complete the demographic form and knowledge and attitude questionnaire with their mothers. The intervention group was provided with two 90-minute training sessions about breast cancer and BSE using films, pamphlets, and practical training after receiving the questionnaires. The students were asked to convey the training to their mothers. On the other hand, the control group did not receive any training.

After a month, the mothers came to a specific place and re-completed the awareness questionnaire. However, at this stage, 20 mothers did not attend to fill out the questionnaire. Finally, the analysis was performed on 100 mothers (50 cases in each group).

### Statistical analysis

The data were analyzed using descriptive (e.g., frequency and percentage) and inferential statistics, including paired sample and t-independent t-tests, Chi-square test, and Fisher's exact test. In all analyses, the confidence coefficient and significance level were considered 95% and 0.05, respectively. Data analyses were performed in SPSS software (version 17).

### Results

According to the results, both groups were homogeneous in terms of age, employment status, marital status, education level, menopause, and family history of cancer (Table 1). The mean ages of the participants in the control and intervention groups were  $44.66 \pm 6.076$  and  $45.06 \pm 5.776$  years, respectively. Considering the information about BSE, 56% of the respondents reported to have

information in this regard, while the rest had no such information. The most frequent sources of information on BSE were doctors as reported by 41.6% and 28.6% of the participants in the control and intervention groups, respectively. Other sources of information included nurses/midwives (13.8% in the control group and 25% in the intervention group), others (17.2% in the control group and 28.6% in the intervention group), and radio/television (24% in the control group and 17.9% in the intervention group).

In terms of the frequency of BSE, 39.1% and 25% of the participants in the control and intervention groups monthly performed BSE, respectively. The lack of information about BSE was reported as the most frequently mentioned reason for not performing BSE by 55.6% and 41.2% of the participants in the control and intervention groups, respectively. The other reasons accounting for non-practice of BSE were laziness (18.5% in the control group and 26.5% in the intervention group), unawareness about BSE (14.8% in the control group and 11.8% in the intervention group), unnecessary test (7.4% in the control group and 11.8% in the intervention group), and lack of time (3.7% in the control group and 8.8% in the intervention group).

Most of the participants stated that in case of having a problem with their breasts, they would refer to a doctor (45.5% in the control group and 28.6% in the intervention group). The most frequently mentioned reason for not referring to physicians for periodic examination was the lack of information about the necessity of breast examination by physicians. Furthermore, 34.1% and 17.9% of the participants aged over 40 years in the control and intervention groups performed mammography, respectively, 14.3% of whom underwent this examination on a yearly basis.

In addition, 35.7% and 14.3% of the participants in the control and intervention groups performed mammography every 2-3 years. The majority of the participants (i.e., 50% and 71.4% of the subjects in the control and intervention groups, respectively) performed mammography in case of facing problems. The most frequent reason for not doing mammography in individuals aged older than 40 years was "unnecessary mammography".

Table 2 presents the responses related to the

**Table 1.** Frequency of demographic and some other variables in the intervention and control groups

		Control		Intervention		Test	P-value
		Frequency	%	Frequency	%		
Occupation	Housewife	6	12	7	14	X <sup>2</sup> =0.088	0.766
	Employed	44	88	43	86		
Age (years)	Younger than 40	9	18	11	22	X <sup>2</sup> =0.25	0.617
	Older than 40	41	82	39	78		
Level of education	Elementary	13	26	10	20	X <sup>2</sup> =0.569	0.903
	Junior high school	13	26	13	26		
	High school	17	34	19	38		
	University	7	14	8	16		
Menopause	Yes	10	20	12	24	X <sup>2</sup> =0.233	0.629
	No	40	80	38	76		
Family history of cancer	Yes	16	32	11	22	X <sup>2</sup> = 1.268	0.260
	No	34	68	39	78		
Marital status	Married	48	96	48	96	Fisher's exact test: 0.000	1.000
	Widow	2	4	2	4		

**Table 2.** Frequency of responses related to attitude in the intervention and control groups

	Control Group				case group				Test	P
	Yes		No		Yes		No			
	Frequency	%	Frequency	%	Frequency	%	Frequency	%		
Do you agree with information acquisition regarding breast cancer and lumps?	48	96	2	4	50	100	0	0.0	Fisher's exact test	0.495
Do you like to think about breast cancer?	16	32	34	68	14	28	36	72	x <sup>2</sup> =0.190	0.663
Do you think that BSE is an important method to detect breast cancer and lumps?	39	78	11	22	39	78	11	22	x <sup>2</sup> =0.000	1
Do you believe that breast cancer is a hereditary disease and BSE is not effective in prevention?	15	30	35	70	6	12	44	88	x <sup>2</sup> =4.882	0.027
Do you get anxious when you think about breast cancer screening method?	34	68	16	32	36	72	14	28	x <sup>2</sup> =0.190	0.663
Do you think that BSE is effective in breast cancer detection?	48	96	2	4	44	88	6	12	Fisher's Exact Test	0.269
Are you afraid of finding lumps?	36	72	14	28	37	74	13	26	X <sup>2</sup> =0.051	0.822
Are you ashamed of performing BSE?	6	12	44	88	9	18	41	82	X <sup>2</sup> =0.706	0.401
Do you forget to consider BSE?	40	80	10	20	46	92	4	8	X <sup>2</sup> =2.99	0.084

Continuous of Table 2.										
Do you avoid BSE due to the fear of cancer?	10	20	40	80	13	26	37	74	X <sup>2</sup> =0.508	0.476
Is breast screening necessary if there is no family history of breast cancer?	31	62	19	38	30	60	20	40	X <sup>2</sup> =0.042	0.838
Can you perform BSE on a monthly basis?	44	88	6	12	39	78	11	22	X <sup>2</sup> =1.772	0.183
Is it easy for you to perform BSE?	32	64	18	36	33	66	17	34	X <sup>2</sup> =0.044	0.834

**Table 3.** Comparison of awareness score before and after the intervention in both groups of mothers

	Before the intervention	After the intervention	Mean difference	Paired sample t-test
	Mean±SD	Mean±SD		
<b>Control group</b>	7.42±2.763	7.28±2.548	-0.14	t=1.069, P=0.29
<b>Intervention group</b>	7.20±2.531	15.22±2.477	8.02	t= 25.72, P=0.000
<b>Independent t-test</b>	t=0.415 P=0.679	t=-15.801 P=0.000	t=-24.009 P=0.000	

mothers' attitudes toward BSE. The mean scores of awareness were obtained as 8.42 and 7.2 in the control and intervention groups at the pre-intervention stage, respectively. The results of the t-test revealed no significant difference between the two groups in terms of the mean awareness score before the intervention. At the post-intervention stage, the control group had the mean awareness score of 7.28, which was not significantly different with that obtained at the pre-intervention stage (P=0.29).

In the intervention group, post-intervention awareness score was 15.22, which showed a significant difference with the pre-intervention score (P<0.05). The results of the independent t-test demonstrated a significant difference between the two groups in terms of awareness after the intervention. Regarding the knowledge level of BSE, the intervention and control groups had the mean differences of 8.02 and -0.14 between the two stages, signifying that the changes in the two groups were significant (Table 3).

## Discussion

The spread of awareness regarding BSE by educational programs is essential for all women because breast cancer continues to be a major

cause of morbidity and mortality throughout the world (17, 18). The findings of the present study indicated no significant difference between the intervention and control groups regarding the level of knowledge about BSE before the intervention. However, after the intervention, the control and intervention groups had the awareness scores of 7.28 and 15.22, respectively. The control group showed no significant difference concerning the awareness score at the post-intervention stage, compared to that at the pre-intervention stage. Nonetheless, the intervention group demonstrated a significant difference in this regard between the two study stages.

Numerous studies have investigated this domain. Gürsoy et al. reported a significant difference between awareness scores obtained before training, compared to those achieved after this intervention (t=-15.737, P=0.000). However, in the mentioned study, no control group was considered, and there was only one group (10). Likewise, Fallah et al. observed a significant difference between awareness scores before and after training (19). In addition, in a study performed by Kashfi et al., the results of the paired sample t-test demonstrated a significant difference in the awareness level of

the participants before and after the educational intervention (4).

Jolaei et al. reported that teachers had undesirable and desirable awareness levels of 97.8% and 12.3% about BSE, respectively, before training. These levels reached to 80.85% and 19.15% after training, respectively. Based on the Z test, they observed a significant difference between the pre- and post-intervention awareness levels (3). In another study carried out by Akbarzadeh et al., the mean score of awareness was almost similar in both groups trained with two methods before training, compared to that after training (16). An educational intervention that was based on the Colombian guidelines for educational communication in the framework of cancer control improved the practice of BSE, cancer prevention-related knowledge, as well as the practice of physical activity and vegetable consumption in scholars from a low-income area in Bogota, Colombia (20).

As the finding of the present study demonstrated, the participants had a low level of knowledge about BSE prior to the intervention. The significant enhancement of our subjects' awareness indicated that our training was successful. There are multiple studies using various methods to show the effect of training on BSE, such as group training, individual training, training by pamphlet, using breast model, and using video alone or along with another method. Another different type of education that has been investigated is the presentation of education by breast cancer patients to family members (9, 10). However, to the extent of the researchers' knowledge, the presentation of training by daughters to mothers has not been examined in Iran. Therefore, our study offered a different BSE training method.

Mothers might feel committed or motivated to follow their daughters' instruction. This emotional commitment and motivation might be considered as a stimulus for practicing BSE. The results of our study indicated that training presentation by daughters to mothers can be used as a route to increase awareness concerning BSE. Differences in the methods used in BSE training depend on the type of participants' community, culture, age, level of

literacy, and attitude.

Based on our findings, 46% and 32% of the women in the control and intervention groups practiced BSE, respectively. In this regard, Avci reported that only 4.3% of staff in a Turkish factory regularly performed BSE once a month (6). In a study carried out by Azage et al. on health development staff in Ethiopia, 14.4% of the staff performed BSE monthly (21). In another study conducted by Karimy et al. in Iran on healthy volunteers, 19% of the participants performed BSE (14). Furthermore, Jolaei et al. examining teachers in Mahalat, Iran, reported that BSE was practiced by 26.66% of the participants (3). Considering the aforementioned studies, the level of practicing BSE is different in various studies, which is likely to be associated with different research samples.

In the current study, unawareness was found to be the most important reason for not performing BSE. Laziness and lack of information were the other reasons in this regard. Nafisi et al., reported forgetfulness, lack of information concerning correct BSE, and fear of finding a mass as the most important reasons for not practicing BSE (12). In a study by Naghibi et al., "not believing in BSE" and "becoming more worried" were the main reasons of BSE non-implementation (22). Furthermore, Jolaei et al. reported "not knowing the BSE procedure" as the main reason of not performing BSE by most of the participants (3). In the study conducted by Azage et al., "no problem in breast" and "not knowing the BSE technique" were the main reasons in this regard (21). Parajuli et al. reported three reasons for the non-practice of BSE, including unawareness, lack of time, and uncertainty in BSE (23).

In the present study, unnecessary BSE, lack of time, and lack of information were reported as the most important reasons for not referring to the physician. Concerning mammography, unnecessary mammography examination and lack of information were found to be the most important reasons for not performing mammography. In the study by Jolaei et al., 90.5% of the students never experienced breast examination by a physician or health official, and they had a low level of information concerning BSE (23). In the study by Nafisi et al., "lack of attention to clinical examination",

"no breast problem", "time-takingness of BSE procedure", and "unawareness" were reported as the most important reasons in this respect (12). Since unawareness is the most frequently mentioned reason, rising information in this regard seems essential.

Responses concerning the participants' attitudes toward BSE showed that most of them agreed with information acquisition regarding breast diseases and lumps. Most of them were not interested in thinking about breast cancer. The majority of the participants believed that BSE is effective in cancer diagnosis. In the study by Naghibi et al., 76.4% of the women had a positive attitude toward BSE, and the rest of them had a negative attitude concerning this practice (22). Similarly, in the study performed by Ashrafi et al., most of the participants (68.1%) had positive attitudes in this regard (5). Doshi et al. reported that the majority of the participants believed that all women should perform BSE (24).

In the present study, physicians, others, radio/television, and nurse/midwife were the main sources to obtain information about BSE. On the other hand, media was the least reported source of information in this regard. In the study by Jolaei et al., physicians were the most widely used sources of information, while the media had the lowest rank in this regard (3). In the study by Avci et al., printed documents were the main sources of getting information, while other resources, such as physician and radio/television were rated as the second and third sources of information, respectively (6). Fallah et al. reported radio/television, book/newspaper, and friends as the main sources of obtaining information (19). The difference in the information resources in various studies might be associated with the communities in which the participants were living since regional culture can be effective in this regard.

## Conclusion

Given that the female students are able to convey the information to their mothers effectively, BSE training is recommended for all female students. Since the breast cancer likelihood rises by age, awareness about this issue can be very effective in the early

diagnosis of breast cancer and its prevention. Therefore, the awareness of breast health should be actively promoted by the authorities involved in the development of health policies. It seems that this method is cost-effective in enhancing the mothers' awareness about the given issue.

The emotional relationship between mother and daughter can rise the effectiveness of training, leading to enhanced awareness. One of the limitations of the current study is the risk of exchanging information among students. To resolve this issue, we tried to select students from different groups. Furthermore, this study examined the effect of this kind of education on the level of maternal consciousness, and it failed to investigate the effect of this training on their behavioral change. Consequently, it is suggested to examine the effect of this approach on the performance of mothers in this regard.

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## Conflicts of interest

The authors declare no conflict of interest.

## Authors' contributions

All authors had equal contribution in the design, statistical analysis, and writing of the manuscript.

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