

## Effect of breast-self examination training on health beliefs and practices: student nurses educating relatives

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**A**- Conception and study design; **B** - Collection of data; **C** - Data analysis; **D** - Writing the paper; **E**- Review article; **F** - Approval of the final version of the article; **G** - Other (please specify)

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### ABSTRACT

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**Purpose:** Breast self-examination (BSE) is a critical technique in early detection of breast diseases, especially cancer. This quasi-experimental study was performed to evaluate the effects of BSE training on health beliefs and practices among relatives of nursing students.

**Materials and methods:** The study sample consisted of 133 relatives of nursing students. After training student nurses about BSE, they were requested to train their relatives regarding BSE. The data were collected before and 6 months after BSE training.

**Results:** It was determined that 39.1% (n=52) of women performed BSE before the training and

87.2% (n=116) of them after the training and this difference was statistically significant (p=0.0001). Sensitivity perception (Z=-2.915, p=0.004), benefit perception (Z=-4.888, p=0.0001) and confidence perception (Z=-2.503, p=0.012) of women significantly increased and disability perception (Z=-8.576, p=0.0001) decreased significantly after the training.

**Conclusions:** In conclusion, the BSE training given by nursing students to their relatives enhanced health beliefs and practices of the participants.

**Keywords:** breast self-examination; education; health belief; nursing students; relatives

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## **INTRODUCTION**

For the reason that more than 1.15 million people are diagnosed with breast cancer each year, breast cancer is one of the most common cancer types among women [1]. It is estimated that the incidence of female breast cancer worldwide will reach about 3.2 million new cases per year by 2050 [2]. Although overall mortality rate has decreased for breast cancer patients, it is still the second most common cause of cancer mortality among women [3] and continues to threaten women's health as a global health problem. Therefore, it has been the subject of many researches in terms of diagnosis, treatment, and prevention.

Breast cancer takes the first place in all age groups among the leading causes of cancer deaths in women in Turkey with 24.9 per hundred thousand and 1 out of every 4 women cancers is diagnosed as breast cancer [4]. In addition, the cancer burden is higher in the least developed regions of the world. While high cancer rates are diagnosed in developed and high-income countries, cases in developing countries are often diagnosed at advanced and mostly fatal stages; therefore, it has been reported that mortality rates are high in these countries [5]. The most important reason for this is insufficient breast cancer awareness and the lack of broad-based mammographic screening programs [6]. According to the Statistical Office of the European Union (EUROSTAT), the rate of women aged 50-69 years who have undergone breast cancer screening through mammography in the past two years is 33.3% as of 2017 in Turkey [7]. The majority of the breast cancers diagnosed in Turkey was determined to be at stage III-IV (4). These results and researches indicate that the use of the breast cancer screening program is insufficient in Turkey [8]. Within the scope of the national cancer screening program, although early diagnosis and screening services are available and free, women's participation in breast cancer screenings is very low [7].

American Cancer Society reported that starting annual mammograms until the age of 45, having mammograms every two years after the age of 55, and breast self-examination (BSE) has a critical role in early detection of breast cancer [9]. With the implementation of early diagnosis methods, it has been reported that the life span in breast cancer is prolonged in developed countries [10] and the survival rate of breast cancer patients in developed countries has increased over the last 20 years [9]. However, it is suggested that BSE is the best method that can help the early detection of breast tumors in developing countries where breast cancer screening is rare and leading to delayed diagnosis of cancer. In addition, the fact that BSE can be easily applied and that it is harmless and cost-effective gives superiority to this method. Although the effect of

BSE on reducing cancer mortality is controversial, it is a recommended method for raising breast cancer awareness in women [11]. Referring to the studies, BSE performing rates among women in Turkey varies between 20-80% in general [12,13] and none of the women regularly perform BSE as shown by Altunkan et al. [14]. In a study conducted by Duman et al., it was determined that only two women had mammography [15]. These different results revealed in the studies may result from the lack of education and communication related to breast cancer as well as different educational standards and the socioeconomic factors in different regions of the study.

Performing BSE regularly can guide women to notice changes in breast tissue. For this reason, BSE is considered as one of the easiest and most convenient early detection technique in detecting breast diseases [16]. Therefore, it is important to train women on a planned basis [10]. Nurses and nursing students play an important role in educating society on breast cancer screening methods as they are in constant communication with patients within the healthcare team. In particular, nursing students are in a key position to give BSE training both in terms of increasing their self-awareness and improving their teaching skills.

When a small number of studies with a similar design in the literature were examined; Gursoy et al. showed in their study that the knowledge level of women increased 2 times one month after the BSE training given by the nursing students to their mothers and the difference in the knowledge level before and after training was significant ( $p = .0001$ ) [17]. In the same study, it was reported that the training provided significantly increased perceived benefit ( $p = .032$ ) and confidence ( $p = .0001$ ).

For this reason, our study is designed to be a model in the society in the long run by adopting a different approach, where BSE awareness reaches student's relatives through nursing students. In other words, when nursing students are aware of BSE, they can also train their relatives. This can be considered as a cost-effective method in terms of both screening and treatment of breast cancer. In addition, because the effect of BSE training given within the scope of this study on the Health Belief Model is also examined; the change and sustainability in women's health-related behavior have also been evaluated. Thus, women were allowed to realize why they took preventive measures to detect or control disease.

Many studies have shown that training programs given by different methods affect health beliefs and approaches to breast cancer screening programs, especially beliefs and training programs improve sensitivity, self-efficacy, benefit, disability and health motivation dimensions [8,18–22]. In this study, it was aimed to evaluate the effect of breast

self-examination training given by nursing students on the health beliefs and practices of their relatives.

## MATERIALS AND METHODS

### Study Design and Participants

The data of this semi-experimental study were collected between November 2019 - June 2020. The study included 161 female relatives of 55 nursing students studying at the faculty of health sciences in a state university located in Izmir province in western Turkey, who agreed to

participate in the study and were successful in the knowledge test. Of these participants, 28 were excluded from the scope of the research because they stated that they did not want to continue the research six months after the BSE training. In this case, 133 women constitute the sample of the study. The criteria for inclusion in the study are being 18 years old and older, having not been diagnosed with breast cancer before, voluntarily agreeing to participate in the study, having no known mental, visual, hearing and speech disability, not being pregnant or puerperant and previously not receiving the BSE training (Figure 1).

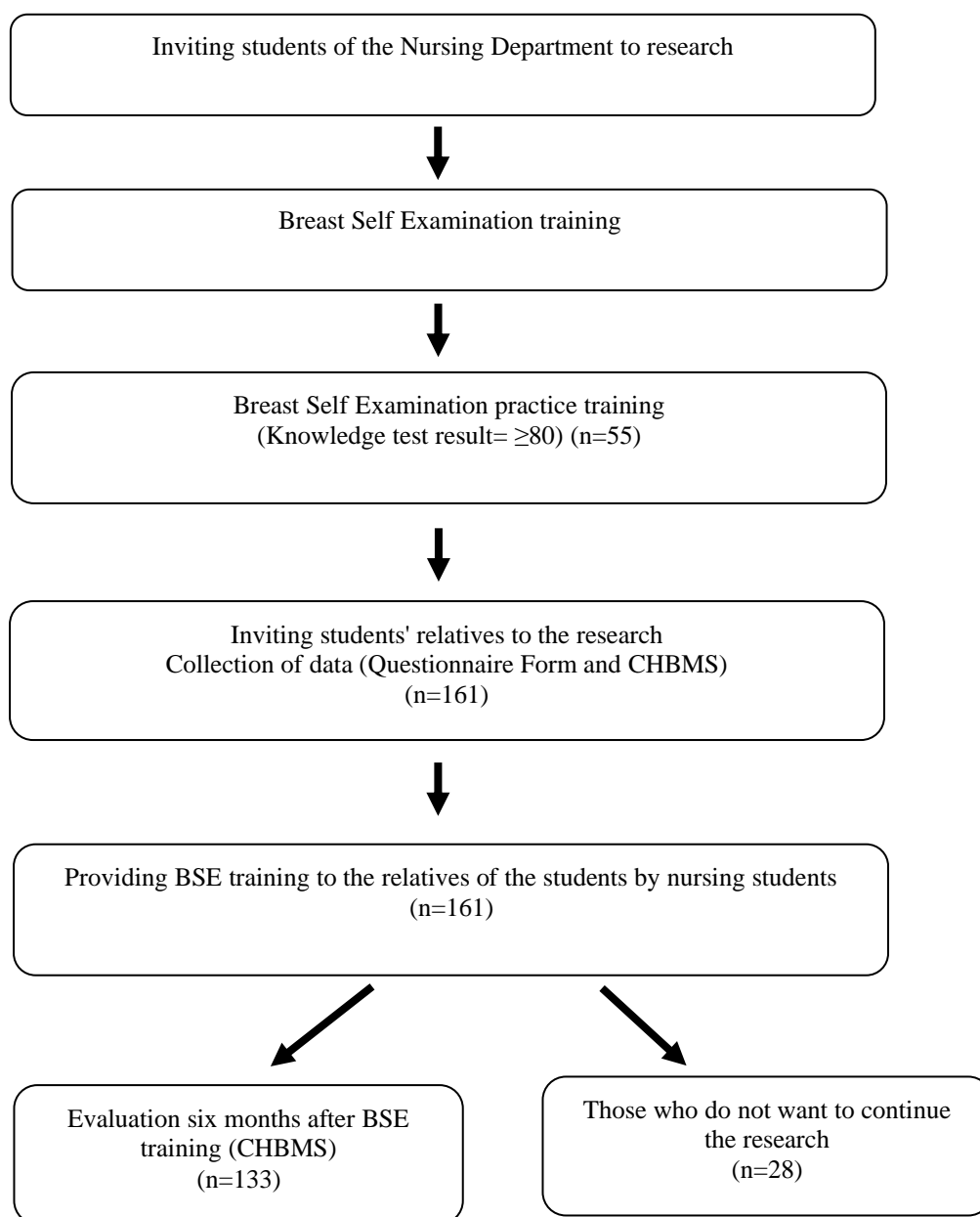


Figure 1. Flow-chart

The protocol of this study consists of two stages. These are the stages of BSE training and evaluation of belief and practice towards BSE. For this, "BSE Training" has been given to students for 60 minutes in the classroom setting after obtaining the written and verbal consent of the students who agreed to participate in the study among the nursing students of the relevant university. At the end of the training, all students were given educational material prepared by the researchers. Students were given 2 days of free time to ensure that they could grasp and repeat the theoretical information they received. During this time, students were asked to repeat the subject with the theoretical training material given to them for BSE. Students were given a knowledge test 2 days after the training. Continuing to work with 55 students who scored 80 or higher from the knowledge test, students were given a practical BSE training. All students performed BSE using the breast models under the supervision of researchers. All application steps were repeated until each student could individually apply the technique in the right way. Students who could correctly and completely apply BSE steps were accepted as having the ability to perform BSE.

Then, student nurses were asked to invite at least 3 relatives who meet the inclusion criteria in the study. Participants who volunteered to be involved in the study were asked to fill out the Questionnaire Form and the Champion's Health Belief Model Scale (CHBMS). Once the data collection forms were filled out, students were asked to give BSE training to their relatives in line with the training they had received. It was ensured that the students used a standard training material by providing them with the same training material prepared by the researchers and given to them during the training. Students gave their BSE training face-to-face where their relatives deemed appropriate. In order to evaluate the effectiveness of the training given by the students, video recording of the training process was asked with the permission of the participants. The recordings were then evaluated by the researchers. The recordings with inappropriate training steps and/or unsuccessful recordings were repeated. Since video recordings were taken during the training, student nurses were provided with knitted breast models to use in their training. Participants, who were given the correct training and whose video recordings were considered valid, were asked to re-fill an electronic CHBMS form 6 months after the training.

### ***Instruments***

The Questionnaire Form and Champion's Health Belief Model Scale were used to collect data from women participating in our research.

The *Questionnaire Form* consists of 12 questions prepared to determine the socio-demographic characteristics of the participants such

as age, marital status, educational status, presence of chronic disease and history of breast cancer and a non-cancer breast disease, presence of breast cancer in their families, BSE application status and frequency.

*Champion's Health Belief Model Scale* was used to determine the student relatives' belief about breast cancer and BSE application. The scale, developed by Victoria Champion in 1984, is a 42-item form consisting of six dimensions, including six concepts of the Health Belief Model. The Cronbach's Alpha coefficient for the internal consistency of the scale was found to be between 0.69 and 0.90 for sub-dimensions. The test-retest for the sub-dimensions of the scale ranges from 0.45 to 0.70. The scale has content and construct validity. The scale was adapted to Turkish by Karayurt and Dramali [23]. The time-scale invariance was found between 0.89 and 0.99 for the sub-dimensions. Cronbach's Alpha reliability coefficients range from 0.58 to 0.89 for the sub-dimensions. The Turkish version of CHBMS was found to be a valid and reliable tool in determining the beliefs and behaviors related to breast cancer and BSE [23]. The Cronbach's Alpha coefficient obtained from this study is 0.84.

In addition, the Knowledge Test Questionnaire consisting of a total of 10 questions including 8 multiple choice and 2 open-ended questions, which measure the knowledge levels of students after BSE training in the first stage of the research, and the Skill Checklist Form prepared by the researchers in line with the relevant literature was used in our research.

### ***Statistical methods***

The analysis of the data obtained from the study was performed in the statistical package for the social sciences SPSS 20.0 software. Introductory information about the participants was given as number, percentage and mean. The compatibility of numerical variables to normal distribution was investigated with the Shapiro-Wilk Test. Wilcoxon, McNemar and McNemar-Bowker Tests were performed to compare the data obtained before and after the training. For all results,  $p < 0.05$  value was considered as statistically significant.

### ***Ethical concerns***

In order to conduct the research, institutional permission was obtained from the university where the study was conducted. In addition, ethics committee approval was obtained from the Ethics Committee of the University of Health Sciences Bozyaka Training and Research Hospital (Date= 23.10.2019 Decision No= 01). After providing information about the study, informed consent was obtained from the students and their relatives.

## RESULTS

The socio-demographic characteristics of the women included in the research are shown in Table 1. The mean age of women was 29.2±12.0 (min= 20, max= 69).

Distribution of women's practices for breast examination before and after the training is given in Table 2. It was determined that 39.1% (n= 52) of women performed BSE before the training and 87.2% (n= 116) of them after the training and this difference was statistically significant (p= 0.0001). Before the training, it was determined that 11.3% (n= 15) of women performed BSE at the right time, 27.8% (n= 37) of them performed randomly

and 60.9% (n= 81) did not perform BSE. After the training, it was determined that 64.7% (n= 86) of women performed BSE at the right time, 22.6% (n= 30) of them performed randomly and 12.8% (n= 17) did not perform BSE. It was determined that the difference in BSE performing times of women before and after the training was statistically significant (p= 0.0001). Before the training, it was determined that 15.8% of women (n= 21) performed BSE every month and 23.3% (n= 31) performed less than once a month. After the training, 69.2% (n= 92) of women performed BSE every month; and 18.0% (n=24) performed less than once a month. The difference between the frequency of women performing BSE was found to be statistically significant (p= 0.0001).

**Table 1.** Distribution of participants by socio-demographic characteristics (n=133)

Socio-demographic Characteristics	Number	Percentage
<b>Marrital Status</b>		
Married	46	34.6
Single	87	65.4
<b>Educational Status</b>		
Primary school	30	22.6
Secondary school	8	6.0
High school	79	59.4
Bachelor's degree	16	12.0
<b>Employment Status</b>		
Employed	24	18.0
Unemployed	109	82.0
<b>Chronic Diseases</b>		
Yes	20	15.0
No	113	85.0
<b>Closeness Degree with Student Nurse</b>		
Sister	5	3.8
Mother	17	12.8
Cousin	20	15.0
Aunt	24	18.0
Friend	67	50.4

**Table 2.** Distribution of Women's Practices for Breast Self-Examination Before and After the Training

	Before Training		After Training		P value
	Number	Percentage	Number	Percentage	
Performing BSE	52	39.1	116	87.2	0.0001
Not-performing BSE	81	60.9	17	12.8	
Performing BSE at the right time	15	11.3	86	64.7	0.0001
Performing BSE randomly	37	27.8	30	22.6	
Not-performing BSE	81	60.9	17	12.8	0.0001
Performing BSE every month	21	15.8	92	69.2	
Performing BSE less than once a month	31	23.3	24	18.0	
Not-performing BSE	81	60.9	17	12.8	

Mean VAS values of the students' relatives participated in the research for practicing the right BSE technique before the training was 3.19±2.76 (min=1 max= 10); while it was determined to be 7.08 ± 2.54 (min=1 max=10) after the training and the difference was statistically significant (Z=8.333 p=

0.0001). The mean VAS values of women for performing BSE at the right time was 2.68±2.48 (min=1 max=10) before the training; while it was determined to be 6.83±2.82 (min=1 max=10) after the training and the difference was statistically significant (Z=-8.494 p=0.0001). It was determined

that the mean value for the satisfaction of women with the training given by students was  $8.79 \pm 2.29$  (min= 1 max= 10).

CHBMS of the women participated in the research before and after the training is given in Table 3. Sensitivity perception ( $Z=-2.915$ ,  $p=0.004$ ), BSE benefit perception ( $Z=-4.888$ ,  $p=0.0001$ ) and BSE confidence perception ( $Z=-2.503$ ,  $p=0.012$ ) of women significantly increased after the training. In addition, it was observed that BSE

disability perception ( $Z=-8.576$ ,  $p=0.0001$ ) decreased significantly after the training. It was determined that the mean score for the perception of seriousness sub-dimension decreased after the training, but the difference was not statistically significant ( $Z=-1.774$   $p=0.076$ ). It was determined that the mean score for the health motivation sub-dimension increased after the training, but the difference was not statistically significant ( $Z=-1.576$   $p=0.115$ ).

**Table 3.** Health belief scores of women for breast self-examination before and after the training

Sub-dimensions	Before Training	After Training	Z	p
	$\bar{x} \pm SD$	$\bar{x} \pm SD$		
Susceptibility	$6.17 \pm 2.65$	$6.84 \pm 2.53$	-2.915	0.004
Seriousness	$21.09 \pm 7.17$	$20.05 \pm 6.09$	-1.774	0.076
Health motivation	$26.61 \pm 4.54$	$27.55 \pm 4.47$	-1.576	0.115
Benefit of BSE	$17.65 \pm 3.17$	$18.07 \pm 2.69$	-4.888	0.0001
Barriers of BSE	$22.22 \pm 5.85$	$19.42 \pm 6.53$	-8.576	0.0001
Confidence	$27.01 \pm 9.87$	$40.12 \pm 8.55$	-2.503	0.012

## DISCUSSION

In this study, it was aimed to determine the effect of BSE training on the health beliefs and practices of the students' relatives. BSE, which has an important place in early diagnosis of breast cancer, is recommended to be performed monthly for all women without age restrictions [24,25]. According to 2014 data in Turkey, 44.5% of women diagnosed with breast cancer are between the ages of 50-69, while 40.4% of them are in the 25-49 age range [26]. The 20-69 age range of student relatives participating in the study indicates that risk groups in Turkey have been reached in the scope of our research.

In BSE training, it is aimed to turn examination skills into a habit in terms of behavior. After BSE training programs given in the researches, the BSE performing status of women was examined. In the studies, it was found that there was a statistically significant change in women's knowledge and practices for early diagnosis of breast cancer immediately after the training given to women [27-29]. In this study, in the follow-up of women in the sixth month from training, the significant increase in the number of BSE performers and the decrease in the number of randomly performers show that the training given by nursing students is effective and turns into a habit (Table 2).

Women performing BSE regularly and at the right time every month before and after menopause is important in early diagnosis of breast cancer [24]. In this study, it was found that in the follow-up after sixth months from the training, the number of women who performed breast self-examination regularly every month increased compared to before and the number of those who

performed less than once a month decreased (Table 2). This finding suggests that the training given by nursing students has been effective for their relatives to diagnose breast cancer.

A positive relationship was revealed between BSE examination performance and early detection of breast cancer [27,30]. In researches providing BSE training, it was found that the opinions of the participants about examination performance increased after the training [27,29]. In this study, after BSE training, the participants evaluated their status of examination with the right technique and at the right time better compared to before the training. The positive increase in the evaluation in the sixth month from the training explains why women continue to perform BSE.

It is emphasized in studies that health beliefs are effective in BSE practice, which is important in the early diagnosis of female breast cancer [8,20]. Despite the descriptive studies conducted on different groups [8,20] evaluated the scores of health motivation, confidence, sensitivity, seriousness, benefit and disability perception towards BSE, it is a remarkable finding that how these health beliefs change with BSE training is not examined. Contrary to these studies, BSE-related CHBMS scores of women who participated in this study were evaluated before and six months after the training.

Evaluation of results indicated that sensitivity, benefit perception and confidence of women about breast self-examination have increased significantly. In addition, it was determined that women's perception of disability regarding breast self-examination was significantly reduced (Table 3).

This study has some limitations that should be mentioned. Firstly, data obtained from the study

cannot be generalized to all women. The results of the research are limited to the answers given by those who participated in the study among the relatives of university students. Another limitation of this study is following up CHBMS evaluation was done 6 months after education. Also, one year follow up should be carried out in the future studies. In this study in-depth health beliefs and practices were not assessed. We recommend future studies to assess health beliefs and practices via qualitative methods.

## CONCLUSIONS

Based on these findings, the training positively affected women's health beliefs about long-term breast self-examination. The BSE training provided by nursing students to their relatives can be used as an effective approach to enhance women's practice, and beliefs about BSE. It is recommended that students should be supported to train their relatives about BSE. In addition, it is suggested that follow-ups will continue after BSE training.

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## Conflicts of interest

The authors declare that they have no conflicts of interest.

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