Evaluation of Breast Self-examination Training in Turkish Women Living in Northwestern Turkey

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Summary

Introduction. *Breast cancer (BC) is one of the most significant health problems among the women. Breast self-examination (BSE) is an examination method which is used by women to detect breast cancer as much early as possible. Training of women about BSE is crucial.*
Methods. *The current study was semi-experimentally single-group pretest-posttest designed in order to evaluate breast self-examination (BSE) training efficacy on Turkish women's knowledge and skills. The study was performed on 119 Turkish women. The data were collected with a three questionnaires and BSE Training Skills Evaluation Form in three phases.*
Results. *81.5% of the women did not perform BSE regularly.*

Rate of correct responses about knowledge on BC, risk factors and screening increased after posttest. Significant improvements were observed in the post-test (after training, after one month and three months training) scores for knowledge of Turkish women' towards BC, risk factors and screening, steps of BSE after the intervention (p < 0.001). To quantify the efficiency of training, effect size (Cohen's d) was derived. For knowledge and ability to do BSE scores, Cohen's d was 1,01 ≤ with large effect size indicating highly effective impact of the training.
Conclusions. *It seems that BSE training is beneficial in women. However, women should receive regular BSE training to renew their knowledge and skills. Long follow-up is required.*

Introduction

Breast cancer (BC) is the most frequent cancer among women and rate of death is increasing day by day [1, 2]. Furthermore, because of the increase in aging, 19.3 million new cases of cancer are estimated to occur in 2025 and more than half of cancer deaths are expected to be seen in less developed regions around the world. In Turkey, BC incidence has increased about two times in the last two years [3]. Increased BC incidence leads more health spending and high death rates. On the other hand, maintaining an effective cancer screening is one of the most important factors to assess the outcomes of diagnosis, and treatment. Due to this reason, BC should be controlled and prevented through early diagnosis and screening program [2, 3]. Mammography, clinical breast examination (CBE) and breast self-examination (BSE) are a crucial for early diagnosis of BC [2, 4].
Breast cancer screening increases quality of life and success of cancer treatment. Besides, it reduces social, economic, and psychological difficulties for the patients and their relatives. Additionally, early diagnosis provides cheaper and more effective treatment, reduces labor loss, and contributes to economic development of a country [5]. BSE, which is recommended to be performed every month, is an easy, cheap, safe, and effective non-invasive screening method for the BC and does not require special equipment. This screening method, which can be easily performed by every woman, may be effective if the women are willing to conduct BSE regularly [2]. Furthermore, performing

regular BSE improve breast awareness and encourage women to take more responsibility for their own health [6]. In a randomized controlled study conducted by Thomas et al. [7], it was found that mortality rates did not change in the 10-year follow-up of women who trained in BSE, however there was an increase in benign biopsy rates among women trained in BSE. Self-detection and rapid diagnosis of breast abnormalities is an important strategy for early diagnosis. Even though BC screening programs in Turkey are free and easily accessible, participation of Turkish women to these programs is relatively low since they do not have sufficient knowledge about breast cancer and consider themselves to be at low-risk group. Consequently, they consider BSE as unnecessary and do not regularly perform BSE [8-11]. Results of the previous studies had similar findings [6, 12-15]. These studies showed that low participation of women in breast cancer screening has still been a global problem around the world.
Success of BC screening program depends on the awareness of the target population. Training of women about BC and screening methods is crucial. Studies showed that lack of knowledge about BSE was the primary reason behind the reluctance of the women to perform BSE and that training on BSE could encourage them to perform BSE and contribute to health-seeking behaviors and cancer control [16-18]. During the BSE training, health professionals should provide information, encourage positive health behaviors, and change the existing incorrect behaviors to maintain the sustainability of women's health. These training programs should deal with the importance of early diagnosis and treatment in cancer control, demonstrate how to perform

BSE and underline the importance of regular BSE [15, 17-20]. The aim of this study was to evaluate the efficiency of the BSE training on Turkish women aged between 20 and 69 years.

Methods

A pre-experimental study with one group pre-and posttest design study was conducted with 119 women between March and June 2016.

PARTICIPANTS AND SETTINGS

A total of 228 women who aged 20 and 69 years were enrolled and regularly participated to sewing, knitting, marbling, wood painting and cake making courses of a municipal women training center located in Safranbolu-Karabuk in Northwestern Black Sea region of Turkey. Turkish Ministry of Health Breast Cancer Screening Program considers the women between 20 to 69 ages as eligible for BSE practice. Raousoft sample size calculator was used to calculate the sample size. With 90% reliability and 5%, the error margin sample size was calculated as 127 women. The sample comprised 119 women, who agreed to take part in the study and participated to all the three sessions of the BSE training.

MEASUREMENTS

The data were obtained using the three questionnaires developed by researchers according to relevant literature [1, 2, 21, 22] and the Breast Self-Examination Training Skills Evaluation Form.

Personal Information Questionnaire (Q1)

This questionnaire included 13 items on age, profession, marital and education status, age at menarche and first pregnancy, parity, duration of breastfeeding, use of birth control pills, receiving postmenopausal hormone therapy and radiotherapy, smoking habits, regular performance of BSE and family history of breast cancer among first-and-second degree relatives.

The Women's Knowledge about Breast Cancer, Risk Factors and Screening Questionnaire (Q2)

This questionnaire was composed of 12 items, which asked the participants to self-evaluate their knowledge on BC and screening on a three-point scale (Yes, no, I don't know). In our study, Cronbach's alpha was 0.82.

Women's Knowledge on Performing Breast Self-Examination Questionnaire (Q3)

This survey was consisted of 11 items, which asked the respondents to self-evaluate their knowledge on BSE on a three-point scale (Yes, no, I don't know). In our study Cronbach's alpha was 0.85.

BSE Training Skills Evaluation Form (Q4)

This form was prepared by Taskin [23] and was published in the book, entitled "Birth and Women's Health Practice Guide for Nurses and Midwives". The form listed the stages to be performed during BSE and was composed of 26 items. Researchers asked the women to perform BSE on their bodies or a mannequin and evaluated their practice by using this questionnaire. Each of the 26 items was scored one point and proper BSE practice was scored five points. Higher scores mean better practice of BSE, with the total score ranging from 1-31 [23].

DATA COLLECTION

The study was carried out in three phases: the first phase (pre-training phase) and the second phase (training phase) and the third phase (post-training phase).

First phase (pre-training)

One week before, Safranbolu Cultural Activities Center managers announced that training about BC, screening and BSE would be provided to all women who were attending courses at the center. On the day of the training, the researcher went to the center two hours before the training and completed the preparations for the meeting room. Later, women were gathered in the meeting room. To evaluate the pre-test and post-test, researcher wanted to write nickname from women.

Second phase (training phase)

Before the training began, the purpose of study was explained by the researcher. At the beginning of this phase, pink ribbons were given to women and explained pink ribbon as the symbol of breast cancer. Pink pencils were delivered to complete data forms. All questionnaires for pre-test were distributed before the training. Women completed the questionnaire in about 20 minutes. The training provided for women aimed to improve their knowledge about BC and screening and to promote their practical performance of BSE. In the training, a power point presentation was given by the researcher to women for improving their knowledge of BC and screening, which took 120 minutes. Specifically, a phase of the training program included BC and risk factors, symptoms, screening methods for the early detection of BC. Researcher emphasized the importance of BSE. Additionally, researcher showed the practice of BSE on the model and then were asked to practice BSE on their own bodies once. At the end of the training, brochures that were designed and illustrated BSE steps were handed out to the women.

Third phase (post-training)

After a 15-minute break, Q1, Q2 and Q3 were distributed again for evaluation of impact of the training. Women filled in their questionnaires again after one month and three months. Women's responses for the pre- and post-intervention questions were obtained via face-to-face interviews (after one month and after three months). The study continued for 12 weeks.

STATISTICAL ANALYSIS

Data was analyzed using Statistical Package for the Social Sciences (SPSS 20.0, IBM Corp.; Armonk, NY, USA).

Descriptive characteristics of the women and their level of knowledge were analyzed by percentage and frequency analysis. Multivariate variance analysis was used to analyze the relationships between training and knowledge of BC and screening, knowledge on steps of BSE and skills. Pearson's correlation analysis was used to analyze the relationship between knowledge of the women towards steps of BSE and their skills. The effect size of the significant difference in the measurements was calculated by Cohen's d effect size analysis [24]. Statistical significance level was taken as $p < 0.05$.

ETHICAL CONSIDERATION

Ethical approval for the study was obtained from the ethical review committee of Karabuk University (2015/08, protocol no: 33479383/35) and institutional permission was obtained from the administration of Safranbolu-Karabuk-Turkey Cultural Activities Center. Permission to use the BSE Training Skills Evaluation Questionnaire was received via e-mail from the Turkish author. The women were assured of anonymity and confidentiality, and they were informed that the completion of the questionnaire can be carried out in private and at the respondents' leisure. All data were stored in a secure, locked safe. The Turkish women were assured that their participation in the study was not obligatory. Also, they had the right to withdraw from the study at any time.

Findings

Some personal characteristics of the women have been presented in Table I. Mean age of the women was 37.4 ± 2.9, 76.5% were married, 39.5% graduated from high school and 60.5% were housewives. Only, 18.5% of women performed BSE regularly.

Table II reports the knowledge of women on BC, risk factors and BCS before and after the training. In present study, women' correct response rate about knowledge on BC, risk factors and BCS increased after the training.

Table III indicates that the knowledge of women towards steps of BSE. As the table depicts, the rate of correct answers towards steps of BSE increased after the post test.

Table IV shows the comparison of mean on knowledge BC, screening, steps of BSE and practical competency before

Tab. I. Descriptive characteristics of Turkish women (n = 119).

Variables		n (%)
Mean of age 37.4 ± 2.9		
Marital status	Married	91 (76.5)
	Single	28 (23.5)
Education	Primary	44 (37.0)
	High school	47 (39.5)
	University	28 (23.5)
Profession	Housewife	72 (60.5)
	Civil servant	10 (8.4)
	Employee	37 (31.1)
Performs BSE regularly (Monthly)	Yes	22 (18.5)

and after the training. There was a statistically significant increase on scores of knowledges towards BC, risk factors, screening, steps of BSE and practical competency before and after the training periods ($F = 8.968$, $p \leq 0.001$; $F = 38.113$, $p \leq 0.001$; $F = 117.000$, $p \leq 0.01$, respectively) with very large effect size (Cohen $d = 1,01 \leq$)

Table V reports the correlation between women' knowledge on steps of BSE and women' ability to do BSE after immediately, one month and three months. There was a positive correlation between knowledge on steps of BSE and BSE skills before and after the training ($p < 0.001$).

Discussion

BSE is an important screening method since it empowers women against BC, encourages them to take their own responsibility and improves their awareness on cancer [22]. In present study, it was found minority (18.5%) of the women performed BSE regularly. Previous studies reported the percentage of women's that regularly performed BSE ranged between 14 and 65% [10, 11, 25, 26]. All these studies and our study suggest that women are dismissing the importance of BSE in the early diagnosis of BC. On the other hand, the low percentage of women that performed BSE in our study was not desirable.

In the present study, it was determined that women's knowledge of breast cancer risk factors and screening was not at a satisfactory in pretest phase. Previous studies have reported that women's knowledge towards BC, risk factors and screening was low [11, 25-28]. Relatively lower rates of correct answers in these studies may be related with the fact that the participants different characteristics like age, education, occupation etc. On the other hand, these findings show insufficient knowledge of breast self-examination before training, thus there are needed to investigate the barriers and facilitators.

World Health Organization recommends women to perform BSE regularly as a part of the program to promote health [22]. Effectiveness of BSE among women depends on the development of programs to improve knowledge and awareness on and to encourage attitudes towards performing BSE. Training provided by health professionals may increase the awareness of women on breast cancer and may enable them to perform BSE on a regular basis [17, 28]. In our study, it was reported that women' correct response rate about knowledge on BC, risk factors and BCS increased after the training. For example, many women did not know about the possibility of BC risk factors such age, being overweight, family history, diet, breast feeding, never given birth, hormone therapy, menstrual history) before training. Correct rate highly increased after training (above 95%). Previous studies indicated that BC, risk factors and early detection stated more given correct answers in the post training test compared to the pretraining period. For example, In Turkey, Yılmaz et al. [29] stated that knowledge scores of women were increased significantly from the pretest to the post test after four weeks, Ozerdogan et al. [30] reported after three weeks training, similarly Bayık Temel et al. [31] showed after six months training.

Tab. II. Knowledge of women on BC, risk factors and BCS before and after the training (n = 119).

Answers given related with BC, risk factors and screening	Correct response in pre-test n (%)	Correct response in post-test n (%)
Breast cancer is the most common cancer among women	117 (98.3)	119 (100.0)
Being overweight, family history, personal history of BC increases the risk of BC	21 (17.6)	108 (90.8)
No history of breastfeeding, never given birth increase the risk of BC	7 (5.9)	114 (95.8)
Receiving postmenopausal hormone therapy, menstrual history increases the risk of BC	14 (11.8)	117 (98.3)
Diets with red meat and animal fat, lack of exercise increase the risk of BC	19 (16.0)	117 (98.3)
Change in size, shape, or direction of nipples may an indicator of BC	37 (31.1)	108 (90.8)
If there is a lump or mass in the breast, sore in nipples, nipple retraction, appearance like an orange peel, or a lump or swelling in the underarm area, a woman should visit a hospital	77 (64.7)	119 (100.0)
Mammography, clinical breast examination (CBE), and breast self-examination (BSE) is very crucial of BC early diagnosis.	34 (28.6)	119 (100.0)
BSE should be practices every month after the age 20.	28 (23.5)	119 (100.0)
BSE should be performed monthly	22 (18.5)	119 (100.0)
CBE should be practiced by a doctor once in 2-3 years in women aged between 20-40 and every year in women older than 40 years.	27 (22.7)	110 (92.4)
Women who do not have a risk factor for BC should start mammography at the age of 40	20 (16.8)	108 (90.8)

Tab. III. Knowledge of women towards steps of BSE before and after the training (n = 119).

Knowledge on steps of BSE (n = 119)	Correct response in Pre-test n (%)	Correct response in Post-test n (%)
BSE should be performed monthly	22 (18.5)	119 (100.0)
Visual examination is the first stage of BSE	56 (47.1)	119 (100.0)
A woman should check for an asymmetry between your two breasts.	53 (44.5)	119 (100.0)
Proper positioning and diagnosis technique are crucial for BSE	70 (58.8)	119 (100.0)
You should stand before a mirror that reflects upper part of body	25(21.0)	98 (82.4)
Breasts are controlled in front of a mirror in point of shapes, size, appearance with arms at sides, arms on hips	25 (21.0)	114 (95.8)
Hands are pressed against hips, shoulders and elbows are placed in front by bending towards mirror and breasts are watched	32 (26.9)	108 (90.8)
Control nipples for discharge by kindly squeezing	42 (35.3)	113 (95.0)
Use 2nd, 3rd, and 4th fingers of your hand to touch every part of your breast. During this phase, fingers should be kept close	25 (21.0)	102 (85.7)
Examination should be done over breasts by circle and horizontal movements slowly	35 (29.4)	110 (92.4)
During the examination, all of breast should gradually slow, moderate, and strong pressures.	40 (33.6)	108 (90.8)
Hand examination should be done by both lie-flat position and standing. Each breast should control at least for five minutes.	25 (21.0)	110 (92.4)
Clasp your hand behind your head and look carefully for any changes in the shape of your breasts	40 (33.6)	108 (90.8)
Put a pillow or towel under your shoulder for the breast to be examined while lying down	15 (12.6)	113 (94.5)
While standing or lying down, underpins are examined by hand after breasts by palpation	20 (16.8)	115 (96.6)

Studies in other countries have also reported that BSE training improved the knowledge levels of women about BC [15, 16, 32, 33] in a similar way to our research.

In the current study, it was indicated that women' correct response rate about steps of BCS increased one and three months after the training. Despite the existence of research, which evaluated the effectiveness of BSE training, we did not find any studies that used the BSE training skills evaluation form. However, Ayran et al. [25] reported that there were significant differences in BSE skill levels before and after BSE education given to enhance the ability to do BSE. Bayik Temel et al. [31] determined that the behavior change for BSE in the sixth month post-training. Similarly, Qadir Ibrahim et al. [34] showed that there was a highly

Tab. IV. Comparison of mean differences on knowledge BC, BCS and steps of BSE and practical competency before and after the training periods.

Knowledge on BC, risk factors and screening	X±SS	df	Wilks' lambda	Effect size (Cohen's d)	F*	p
Pre-test	5.54 ± 1.594	3	0.812	2.94[a]	8.968	< 0.001
Post- test	8.67 ± 1.176			1.30[b]		
Re-test after 1 month	7.32 ± 1.096			1.35[c]		
Re-test after 3 months	7.37 ± 1.065					
Knowledge of steps of BSE		3	0.504		38.113	< 0.001
Pretest	5.44 ± 2.342			1.75[d]		
Post-post test	8.83 ± 1.392			1.25[e]		
Re-test after 1 month	7.82 ± 1.315			1.34[f]		
Re-test after 3 months	7.96 ± 1.245					
BSE skills					117.000	< 0.01
Pretest	16.36±1.462	2	0.926	7.06[g]		
Post-test	26.39 ± 1.376			4.90[h]		
Re-test after 1 month	25.53 ± 2.201			4.78[I]		
Re-test after 3 months	25.93 ± 2.424					

* Multivariance analysis (MANOVA); [a] Pre-test and post-test (large effect size), [b] Pre-test and re-test after 1 months (large effect size), [c] Pre-test and re-test after 3 months (large effect size), [d] Pre-test and post-test (large effect size), [e] Pre-test and re-test after 1 months (large effect size), [f] Pre-test and re-test after 3 months (large effect size), [g] Pre-test and post-test (large effect size), [h] Pre-test and re-test after 1 months (large effect size), [I] Pre-test and re-test after 3 months (large effect size).

Tab. V. Relationship between knowledge on steps of BSE and BSE skills before and after the training periods.

Knowledge on steps of BSE				
BSE Skills		Post-test	Retest after 1 month	Retest after 3 months
Post-test	r	.305	-	-
	p	< 0.001	-	-
Re-test after 1 month	r	-	.537	-
	p	-	< 0.001	-
Re-test after 3 months	r	-	-	.549
	p	-	-	< 0.001

Pearson Correlation Coefficient *p < .05.

significant differences between pre and posttest regarding Iraqi women's knowledge of steps of BSE. Increased knowledge of steps of BSE may help to promote women's awareness of BC and screening and to improve the treatment success, increase benign biopsy rates, and reduce mortality rates. Therefore, this training program should organize periodically and should follow-up long term.

Knowledge of practice of BSE are crucial to maintain screening behavior. In the present study, it was seen that there was a positive correlation between knowledge of BSE steps and ability to do BSE (BSE skills). Ayran et al. [25] indicated that given BSE knowledge changes supported developing awareness about BC and BSE. Previous studies showed that similar finding that evaluated effects of knowledge on women's BSE practice [15, 31, 33, 35]. Another study conducted in Egypt found that there was a positive correlation between the knowledge, attitude and behavior scores of women and there was also a stronger correlation between the level of knowledge and skills of BSE [34]. Based on these findings, we may conclude that training on BC and screening are important to increase the awareness on BC and encourage and perform correct BSE. The study results were in line with literature.

There are some limitations of this study. Firstly, this study was an observational study in which women underwent breast health education and BSE training. There was no control group in the study. The testing of the women consisted only of knowledge test. Thus, we cannot be distinguished what aspect of the training changed the outcomes for the women. Secondly, the study was conducted on women, who were enrolled to courses provided by Safranbolu Cultural Activities Center, thus the findings may only be generalizable to the women in Safranbolu district of Karabuk province.

Conclusions

We found that during and after the BSE training, women had the opportunity to learn about BC, risk factors and BSE, which, in turn, resulted with increase in their knowledge on BSE. Besides, the training may be an opportunity to perform BSE on a mannequin under the supervision of the BSE trainer and may help to realize and to correct wrong skills. On the other hand, knowledge level of women on BC, and BCS and steps of BSE, which were not at demanded levels before training, however improved after the BSE training. We believe that planned BSE training may help women

to perform BSE by using correct techniques three months after the training. However, this change in health behavior should be followed by long term and women should receive regular BSE training to renew their knowledge and skills. Furthermore, additional materials, such as comprehensible brochures and text messages may contribute to improve the training.

Acknowledgments

Ethical aproval

Ethical approval for the study was obtained from the ethical review committee of Karabuk University (2015/08, protocol no: 33479383/35) and institutional permission was obtained from the administration of Safranbolu-Karabuk-Turkey Cultural Activities Center.

Conflict of interest statement

The authors declare that they have no conflicts of interest

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Authors' contributions

Study design: I.I.A., and N.K; Data collection: N.K, Data analysis and interpretation: I.I.A., and N.K; Manuscript preparation: I.I.A., and N.K wrote the original draft. All authors approved the final manuscript for submission.

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