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The effect of self-breast examination training provided to women between 18 and 49 years of age and practice on the belief of breast health: A randomized controlled study

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ABSTRACT. İncrease and implementation of training programs in order to recognize the risk factors of breast cancer,in women, at an early stage and to increase their awareness of their own bodies are very important. The aim of the present research was to detect the effect of self-breast examination provided to women between 18 and 49 years of age and practice on the belief of women on their breast health. The research is a randomized controlled interventional design including a pre-test and post-test. The universe of the research consisted of the female parents of the students studying in two schools where the research was conducted. The research sample consisted of 98 women, 45 in the intervention group and 53 in the control group, selected by simple random sampling. It was detected that the perception of disability increased from 14.86 ± 3.53 to 16.51 ± 2.62, and the sense of confidence increased from 24.35 ± 5.41 to 31.20 ± 4.86 in the intervention group after the training ($p<0.01$).It was detected at the end of the study that women had a positive attitude towards the practices to prevent breast cancer after the training. It was detected that there was a significant decrease in the level of barriers perceived by women to take protective measures. Nurses gain basic knowledge and skills BSE practice to be a role model for other women in the society, and organize appropriate training programs in order to encourage BSE awareness and practices.

Keywords: Primary prevention; cancer screening; breast cancer; health education; Türkiye.

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Introduction

Breast cancer is the most common type of cancer in women. It is reported that 1 out of every 4 women diagnosed with cancer has breast cancer. This type of cancer affects 2.1 million women every year and constitutes approximately 15% of all cancer deaths in women. When the data are reviewed in this context, it is stated that 627,000 women died from breast cancer all over the world in 2018 (World Health Organization, 2019). The incidence of breast cancer increases in almost every region globally, with a higher incidence among women in more developed regions (WHO, 2019). The International Cancer Agency drew attention to the rate of increase in breast cancer; however, it is stated that the incidence of breast cancer in women increased by 20% and deaths from breast cancer by 14%. It is reported when women diagnosed with breast cancer in Turkey are examined that 44.5% of them are between 50 and 69 years of age, 40.4% are between 25 and 49 years of age, and 11.1% of invasive cases are at the advanced stage (The International Agency for Research on Cancer, 2014).

There are many factors that trigger and increase the prevalence of breast cancer with a very higher prevalence in women. These factors include familial predisposition, hormonal changes and fertility characteristics; however, individual and environmental factors affect the process (Tuna et al., 2022). Therefore, early diagnosis and prevention methods are very important in breast cancer, as the slow progression of the disease and delayed detection will adversely affect the treatment process of the individual (Özdemir & Unal, 2023). The methods of early diagnosis and prevention of breast cancer include breast self-examination (BSE) which is applied to detect a mass or different conditions in the breast, clinical examination performed by a physician and mammography (Habtegiorgis et al., 2022; Özdemir and Unal, 2023). Since BSE is an easy, noninvasive procedure that does not require any equipment, it is superior to other diagnostic methods and it has features that will strengthen individual awareness (Ishtiak et al., 2022). BSE is an easy-to-learn physical

examination method that allows women to notice about their own body, to take control of their own health, and to recognize abnormal findings in their body beforehand (Habtegiordus et al., 2022; Ishtiak et al., 2022).

According to the national breast cancer screening standards in Turkey, women should have regular breast self-examination every month after the age of 20 years, women between t20 and 40 years pf age should have clinical breast exams every 2 years, women between 40 and 69 years of age are recommended to have a clinical breast examination every two years and have a mammogram every two years (Ministry of Health, 2019). However, previous studies have shown that the rate of early diagnosis behaviors against breast cancer in women is lower (Altıntaş & Aslan, 2020; Ginsburg et al., 2020). It is thought that the belief systems of individuals regarding this behavior have a great importance in learning and maintaining a behavior. The effect of the beliefs on health behaviors has formed the theoretical framework in studies investigating breast cancer screening behaviors such as BSE and mammography. Therefore, the Health Belief Model Scale (SIM) was used to determine the effect of beliefs on health behaviors. It was demonstrated in many previous studies that training provided with different methods affects health beliefs and approaches to breast cancer screening programs, especially beliefs and the education given improve the dimensions of sensitivity, self-efficacy, benefit and health motivation, and these sub-dimensions are perceived higher in the post-test (Akhtari-Zavare et al., 2016; Mesoudiyekta et al., 2018; Kissal & Kartal, 2019). In addition to limited studies on the subject, increase and implementation of training programs in order to recognize the risk factors of breast cancer, especially in women, at an early stage and to increase their awareness of their own bodies are very important. From this point of view, this research was conducted to detect the effect of breast examination education and practice on beliefs of women about breast health.

Hypothesis

H1:After the breast cancer and BSE training provided to the intervention group, a significant difference was found between the Health Belief Model sub-dimensions of the intervention and control groups.

Material and methods

This is a randomized controlled interventional design including a pre-test and post-test. The study was carried out in Konya located in the Central Anatolia region of Turkey between November 2022 and February 2023.Two schools in the Karatay district of Konya Province were determined as the research location in terms of transportation and communication convenience.

The research population consisted of female parents of students in two schools in the Karatay district of Konya province. The sample size was calculated with the G-Power analysis method for the group whose population size was definite. It was determined that the sample size should be at least 72 with the assumption of $1-\beta = 0.80$ power and $\alpha = 0.05$ significance level and $f = 0.60$ effect size. The research was completed with a total of 98 samples including 45 samples in the interventional group and 53 in the control group.

Inclusion and Exclusion Criteria: Women between 18 and 49 years of age with ongoing fertility, no communication problems, and no disease that could affect perception were included in the study. Women who were previously diagnosed with breast cancer or treated for breast cancer, those diagnosed with a medical mental illness and treated for this reason, and women who were in active treatment in the hospital for any problem were not included in the study.

Randomization: The parents of the students enrolled in the two primary schools where the research was conducted were informed about the research. Communication was achieved through phone-call with the parents who were included in the interventional and control groups. A number was assigned to each parent to determine the interventional and control groups among the parents who agreed to participate in the study. The numbers were uploaded to “random.com” and the groups were determined by random selection. After the interventional and control groups were determined randomly, the participants were informed by phone. An appointment was organized for the training day with the interventional group to be trained.

Blinding: Since this study was a training-oriented study, the researchers could not blind the interventional and control groups. However, the link created by the statistician to collect data was only visible to the statistician. Researchers could not see the data obtained. All analysis was done by a statistician who was not affiliated with the research. The statistical blinding was thereby achieved in the study.

Data Collection Tools, The research data were collected through Personal Information Form and Champion Health Belief Model Scale.

Personal Information Form: The form created by the researchers contained a total of 19 questions, including personal questions such as age, educational status, marital status, number of children, age at menarche, hormone therapy, smoking and alcohol use, presence of close relatives with breast cancer, mammography, clinical breast examination, BSE application status (Ishtiak et al., 2022; Habtegiorgis et al., 2022).

Champion Health Belief Model Scale (CHBMS): This scale was developed by Victoria Champion in 1984 as a five-point Likert scale. The purpose of developing the scale is to determine the beliefs and attitudes of women about breast cancer and breast self-examination. The scales consist of 42 items (Champion, 1984). The adaptation of the scale to Turkish was done by Karayurt and Dramalı (2007). The CHBMS has six sub-dimensions. The "perception of sensitivity" sub-dimension regarding breast cancer refers to the perceived individual risks in getting breast cancer and consists of 3 items (Items 1, 2 and 3). The "perception of severity" sub-dimension related to breast cancer defines the degree of individual threat perceived by the individual from breast cancer and consists of 7 items (Items 4, 5, 6, 7, 8, 9, 10). The “perception of benefit” sub-dimension for BSE practice expresses the perceived advantages of BSE and consists of four items (Items 11, 12, 13, 14). The "perception of disability" sub-dimension of BSE application defines the perceived disability related to BSE and consists of 11 items (Items 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25). The “confidence” sub-dimension regarding BSE application refers to the perceived individual competence in BSE application skill in order to detect abnormal breast masses and consists of 10 items (Items 26, 27, 28, 29 30, 31, 32, 33, 34, 35). The "health motivation" sub-dimension expresses the interests and concerns of individuals about their health status and consists of seven items (Items 36, 37, 38, 39, 40, 41, and 42). Each sub-dimension of the scale is evaluated separately; the total score including the whole scale is not calculated. The Cronbach Alpha reliability coefficients of the scale vary between 0.58 and 0.89 for the sub-dimensions (Karayurt, & Dramalı, 2007). The Cronbach Alpha reliability coefficients obtained from this study were 0.77, 0.84, 0.82, 0.79, 0.85, 0.51 for their sub-dimensions, respectively.

Data collection

The data of the study were collected in the form of a pretest-posttest online questionnaire application with personal interview technique. The parents included in the interventional group were contacted via telephone, and they were informed about BSE and the purpose of the research. The parents selected for the interventional group were invited to the school where the application was made at this phone call; it was also reported that an online questionnaire would be sent to the parents selected for the control group. A pretest data collection link was sent to the participants via WhatsApp. The parents included in the interventional group who were invited to the school for training were taken to the education room of the school. A seating arrangement was provided in the training room where they could listen to the training from start to finish. Furthermore, an area with a screen and a stretcher was created; the researchers could demonstrate by performing the breast examination in that area. After each woman was brought into the room individually, the researchers performed the application in standing, sitting and lying positions, taking care to maintain privacy. The Personal Information Form which is one of the data collection tools and CHBMS were administered to the interventional group as a pre-test before the training. After the verbal training was completed, the practice was completed after the "show first, then make her do" technique. The parents in the interventional and control groups were contacted by phone and it was reported that they would fill in the posttest questionnaires after one week following the practice. The posttest data collection link was then shared with the participants via WhatsApp and the posttest data were collected.

BSE Training content and practice

The women were divided into five groups and the training was carried out in five separate sessions in one day. Each training session was completed with the participation of nine female parents. All trainings were held under the same conditions, in the training room of the school. The women were informed about the training before and their consent and consent were obtained. The training prepared by the researcher was presented to the women in the interventional group of the study. The presentation used in the training included information about breast cancer, breast cancer screening programs and breast self-examination. The titles of the training content included the incidence of breast cancer, risk groups, protective factors, diagnostic methods and stages of breast self-examination. The steps of breast self-examination were shown step by step through visual materials. In addition to a slide presentation about breast cancer and BSE, breast self-examination training with a breast examination model was provided to the women through the "show first, then make her do" training technique. After the training, the women were asked to perform the

examination they learned by trying it on themselves. Their practices during this time were observed by the researchers who were also women after the participants gave their consent. It was determined what women did right and what they did wrong during the examination by using a model in breast examination. Adjustments were done to the women by the researchers, and positive feedback was given in order to support adequate actions. The duration of the verbal training was approximately 30 minutes, and the duration of the practical training was approximately 10-15 minutes.

Data evaluation

The analysis of the data obtained from the research was done in SPSS 25.0 (Statistical Package for Social Science) program. Measurable data of the participants were evaluated with mean and standard deviation, and categorical data were evaluated with number and percentage. Kolmogorov-Smirnov test was used to evaluate the normality distribution. The Fisher Exact test was used for data without normal distribution in pairwise comparisons, Student's t and chi-square analyzes were used for binary comparisons according to the suitability of the data from the descriptive tests to normal distribution. Any p value below 0.05 was accepted statistically significant.

Research ethics

Institutional permissions were obtained from the primary schools where the research was conducted. The consent of use was obtained from the authors of the Champion Health Belief Model Scale used in the study. Ethics committee permission was obtained for research from the Ethics Committee Presidency of a University (IRB number: 2022/032; Decision date:21/11/2022). Written and verbal consent was obtained from the individuals who agreed to participate in the study after they were informed about the purpose of the study, the training to be conducted, and the practices. Written informed consent of the participants in the control group was obtained online. After the pretest-posttest data collection process of the study was completed, the training contents about BSE were delivered to the women in the control group online in order to maintain the ethical balance. These contents were included in the presentation slides created by the researchers. Ethical rules in the Declaration of Helsinki were followed at every stage of the study.

Results

The statistical analysis results of the data obtained from a total of 98 women including 45 women in the interventional group and 53 women in the control group are presented in this section.The homogeneous distribution of the intervention and control groups included in the study according to their socio-demographic characteristics is presented in (Table 1). It was detected that there was no significant difference between the intervention and control groups in terms of mean age, education level, marital status, number of children, age at first birth, smoking and alcohol use ($p<0.05$).

Table 1. Comparison of socio-demographical characteristics of intervention and control groups.

Variables		Intervention (n = 45)		Control (n = 53)			
						t	p
Age[µ]	Mean ± SD	36.82	7.094	35.66	12.214	0.729	0.470
	Min-Max	22.00	48.00	19.00	49.00		
		n	%	n	%	X^2	p
Education[*]	Primary School	24	53.3	9	17.0	3.352	0.501
	High School	7	15.6	9	17.0		
	⩾ University	14	31.1	35	66.0		
Marital Status[¥]	Married	44	97.8	40	75.5	0.568	0.256
	Single	1	2.2	13	24.5		
Number of Child[*]	One/Two	26	57.8	30	78.9	0.678	0.208
	⩾ Three	19	42.2	8	21.1		
First Delivery Age[¥]	⩽ 19 years old	7	15.6	14	41.2	5.130	0.274
	20-29 years old	36	80.0	18	52.9		
	⩾ 30	2	4.4	6	5.9		
Smoking[¥]	Yes	4	8.9	16	30.2	0.225	0.636
	No	41	91.1	37	69.8		
Alcohol [¥]	Yes	1	2.2	6	11.3	1.190	0.275
	No	44	97.8	47	88.7		

[µ]Independent samples t-test [*]Chi-square test [¥]Fisher Exact.

The knowledge and practices of the participants about screening for breast cancer and factors that may increase susceptibility to breast cancer were evaluated.Therefore, the age of the participants at menarche, whether they received hormone therapy, the presence of breast cancer in one of their close relatives, regular breast examination, previous mammography, BSE, and if they were doing BSE, the frequency of BSE were investigated. Although there is no significant difference, the most significant differences in terms of numbers are the status of receiving hormone therapy (26.7% in the intervention group, 45.3% in the control group), family history of breast cancer (6.7% in the intervention group, 17% in the control group), BSE (intervention group %. 51.1, 69.8% in the control group, and getting information about BSE (37.8% in the intervention group, 83% in the control group). Since there was no statistically significant difference between the intervention and control groups, it was accepted that the groups presented a homogeneous distribution (Table 2)($p>0.05$).

Table 2. Characteristics of intervention and control groups for breast cancer.

Variables		Intervention		Control			
		n	%	n	%	X^2	p
Age of menarche¥	⩽ 11 years old	3	6.7	9	17.0	2.311	0.728[b]
	12-13 years old	33	73.3	30	56.6		
	⩾ 14 years old	9	20.0	14	26.4		
Hormone therapy*	I had	12	26.7	24	45.3	2.506[a]	0.113
	I didn't have	33	73.3	29	54.7		
Breast cancer in the family¥	Yes	3	6.7	9	17.0	1.220	0.625
	No	42	93.3	44	83.0		
Having breast examination*	Yes	22	48.9	29	54.7	0.412[a]	0.521
	No	23	51.1	24	45.3		
Mammography*	Yes	15	33.3	17	32.1	0.407[a]	0.524
	No	30	66.7	36	67.9		
BSE performance*	Yes	23	51.1	37	69.8	0.189[a]	0.664
	No	22	48.9	16	30.2		
BSE frequency*	Never	24	53.3	14	26.4	4.549[a]	0.337
	Every month	16	35.6	17	32.1		
	Irregular	5	11.1	22	41.5		
Getting information about BSE*	Yes	17	37.8	44	83.0	0.676	0.411
	No	28	62.2	9	17.0		

*Chi-square test ¥Fisher Exact, BSE; Breast self-examination.

The mean scores of the interventional and control groups from the Champion Health Belief Model before and after the training were compared. Accordingly, it was detected when the pre- and post-training averages of the interventional group were evaluated that there was a significant difference between the sub-dimensions of the Champion Health Belief Model, the perception of benefit and the sub-dimensions of trust. It was observed that the mean of the perception of benefit of the interventional group which was 14.86 ± 3.53 in the pretest increased to 16.51 ± 2.62 in the post-test ($p<0.01$). It was determined that the mean score of the interventional group in the sub-dimension of confidence before the training increased from 24.35 ± 5.41 to 31.20 ± 4.86 after the training ($p<0.01$). The evaluation of the control group within itself revealed that the mean of sensitivity perception decreased from 7.49 ± 2.41 in the pretest to 7.03 ± 2.41 in the posttest; however, the perception of the disability decreased from 24.53 ± 6.15 in the pretest to 22.55 ± 5.38 in the posttest ($p<0.05$). It was also detected that the mean of motivation increased from 26.45 ± 4.92 in the pretest to 27.67 ± 4.78 in the posttest ($p<0.01$). The comparison of pretest and posttest averages between the intervention and control groups revealed that the pretest average of the perception of disabilities in the intervention group was 27.97 ± 7.02, the pretest average of the control group was 24.53 ± 6.15, and in the posttest, the average of the intervention group decreased to 25.77 ± 9.02 and the average of the control group decreased to 22.55 ± 5.38 ($p<0.05$). In the confidence sub-dimension, the pretest average of the interventional group was 24.35 ± 5.41, the pretest average of the control group was 28.16 ± 5.81, the posttest average of the intervention group was 31.20± 4.86, and the posttest average of the control group was 28.15 ± 4.80. There was a statistically significant difference between the groups for perception of disability and confidence sub-dimensions (Table 3)($p<0.01$).

Tablo3. Comparison of health belief levels of intervention and control groups for breast cancer before and after the training.

Sub-dimensions		Intervention (n = 45)		Control (n = 53)				
		Min-max	$\bar{X}$ ± SD	Min-max	$\bar{X}$ ± SD	t$^{\mu}$	p	
Sensitivity Perception	Pretest		3-12	8.04 ± 1.94	3-15	7.49 ± 2.41	1.258	0.211
	posttest		3-15	7.53 ± 2.89	3-15	7.03 ± 2.41	0.910	0.365
	t$^{¥}$-p		1.171	0.248	2.108	0.040*		
Severity Perception	Pretest		7-33	22.13 ± 5.71	7-33	20.94 ± 6.35	0.975	0.332
	posttest		10-32	22.02 ± 5.12	7-31	21.33 ± 6.63	0.574	0.567
	t$^{¥}$-p		0.136	0.893	-0.627	0.533		
Benefit Perception	Pretest		6-19	14.86 ± 3.53	4-20	16.01 ± 3.55	-1.603	0.112
	posttest		11-20	16.51 ± 2.62	5-20	16.01 ± 2.98	0.869	0.387
	t$^{¥}$-p		-2.967	0.005**				
Disability Perception	Pretest		11-39	27.97 ± 7.02	12-35	24.53 ± 6.15	2.546	0.013*
	posttest		12-46	25.77 ± 9.02	12-34	22.55 ± 5.38	2.194	0.031*
	t$^{¥}$-p		1.731	0.091	2.329	0.024*		
Confidence	Pretest		10-34	24.35 ± 5.41	10-40	28.16 ± 5.81	-3.360	0.001**
	posttest		19-40	31.20 ± 4.86	15-40	28.15 ± 4.80	3.107	0.003**
	t$^{¥}$-p		-6.214	0.001**	0.030	0.976		
Health Motivation	Pretest		11-70	26.48 ± 8.43	9-35	26.45 ± 4.92	0.025	0.980
	posttest		16-33	27.57 ± 3.59	9-35	27.67 ± 4.78	-0.120	0.905
	t$^{¥}$-p		-0.860	0.395	-3.378	0.001**		

μT-test in independent groups, ¥T-test in dependent groups, *p<0.05, **p<0.01.

Discussion

Breast cancer is the most common type of cancer that causes death among women all over the world. The best way to reduce breast cancer is early diagnosis (Kissal & Kartal, 2019). Screening methods and especially breast self-examination training enable women to recognize their own breast tissues and detect masses in the early period. It is known that breast self-examination is a method that can be applied at any time, that the woman can easily apply at home without any financial payment, and that increases individual awareness(Akhtari-Zavare et al., 2016; Ishtiak et al, 2022).The aim of the present research was to detect the effect of self-breast examination provided to women between 18 and 49 years of age and practice on the belief of women on their breast health. The findings obtained were discussed via current literature.

BSE practice

It was detected that 51.1% of the intervention group and 69.8% of the control group of the participants in the study performed breast self-examination, and the rates of women who have performed BSE regularly every month were 35.6% in the intervention group and 32.1% in the control group. Çömezoğlu et al., (2022) found that although 87% of women considered it necessary to perform BSE, the rate of performing BSE was 38% and the rate of occasional BSE was 30%;Kartal et al., (2017) detected in their study that 17% of women perform BSE, and 11.1% of them perform BSE regularly. When other studies in the literature are evaluated, it is seen that the rates of successive BSE vary between 3% and 83% (Yeshitila et al., 2021; Yılmaz et al., 2020; Özberk & Özberk, 2023; Mekonnen, 2020). Furthermore, literature information shows that the rate of performing BSE is higher in people who have knowledge about BSE than those who do not have any knowledge about BSE (Yeshitila et al., 2021).The rate of women who regularly applied BSE was higher in this study than the studies in the literature. It is considered that this result may have an impact on the regular BSE trainings conducted by health professionals over time.

Sensitivity and severity perception

The difference in the pre-test and post-test CHBMS "sensitivity perception" sub-dimension scores was not statistically significant in the women in the intervention group of this study; however, the evaluation of the control group within itself revealed that the mean sensitivity perception decreased negatively from 7.49 ± 2.41 in the pretest to 7.03 ± 2.41 in the posttest. The "severity perception" sub-dimension scores decreased in the intervention and control groups; however, the difference was not statistically significant.The sensitivity perception is the perception of threat to one's health from a particular illness. This perception refers to the acceptance of a diagnosis, the probability of getting sick, and the general susceptibility of the person to the disease.The higher sensitivity perceived is associated with higher probability of taking preventive actions

(Champion and Skinner 2008; Glanz et al., 2008). The severity perceived is the perception of the consequences of one's illness when left untreated. If the perceived severity level is higher, the probability of exhibiting preventive health behaviors is also higher (Champion and Skinner 2008; Glanz et al., 2008).It was detected in a previous study that there was a significant increase in the perception of sensitivity and severity after the training (Mesoudiyekta et al., 2018). Another study reported that perceived sensitivity and severity scores increased along with training, however, the difference between the intervention and control groups was not statistically significant (Akhtari-Zavare et al., 2016). It was thought that the lack of statistically significant difference in the post-test "sensitivity perception" of the women in the intervention group may be due to the training indicating that this disease is not dangerous when it is diagnosed earlier.

Health motivation and confidence

It was detected when the confidence level of the scale sub-dimensions was evaluated that the confidence sub-dimension score of the intervention group increased from 24.35 ± 5.41 before the training to 31.20 ± 4.86 after the training ($p<0.01$); however, there was not any significant difference in the control group. The mean health motivation of the intervention group in the pre-test increased from 26.48 ± 8.43 to 27.57 ± 3.59; however, this difference was not statistically significant. The mean health motivation of the control group increased from 26.45 ± 4.92 in the pretest to 27.67 ± 4.78 in the posttest ($p<0.01$). Similar to our findings, Kissal & Kartal (2019) did not find aby statistically significant difference in health motivation and confidence score averages despite an increase was detected before and after the training. Özoğul & Dağ (2019) as well as Valera et al., (2018) found that the perceived confidence of women with higher BSE knowledge was found higher.The findings in our research show the positive effect of training. Gaining knowledge, observing BSE practice on breast model, and practicing the BSE has increased the confidence and motivation of women in BSE, and the effectiveness of this practice on early diagnosis.

Benefit and disability perception

It was determined in the research that the perception of benefit of the intervention group increased significantly after the training and the perception of the disability decreased. It is important for people to have a perception of benefits rather than disabilities for acquiring positive behaviors and replacing these with existing ones for health beliefs. If benefits are perceived better than barriers, people will be more likely to engage in preventive health behaviors (Glanz et al., 2008). Seçginli & Nahcivan (2011) reported in their study that the benefit perception increased after the training; Eskandari-Torbaghan et al., (2014) stated in their study that the perception of benefit increased in the intervention group after the training; Mesoudiyekta et al. (2018) addressed that the benefit perception increased after the training. The results showed that education may positively change the perception of benefit and the perception of disability, despite the different training methods. The results of the research are in line with the literature.

Strengths and limitations of the research

The strengths of the study include randomized controlled trial design, adequate sample size, and appropriate statistical testing. The fact that the research was conducted with the parents of the students studying in two schools' limits generalization of the results to whole society. This is the limitation of the study. Researchers did not apply any training program to the control group until the end of the study. Furthermore, the control group may have encountered any information provided by uncontrollable media, any training material and any BSE training information provided by the Ministry during the research process. It was observed in this study that many people in the control group have met these trainings before. Another limitation of the study is that all collected data were self-reported without any objective criteria for evaluation. Consideration of different regions in Turkey for further intervention studies is suggested.

Conclusion and recommendations

There were not any significant changes observed in the perception of sensitivity, perception of seriousness, and health motivation after the education in the study; however, it was observed that there was a significant increase in their perception of the benefit of the measures taken against breast cancer, and a significant decrease was detected in the disability perception perceived for taking preventive measures. It was determined that self-confidence about BSE practice and confidence in the practice increased in women. BSE training is an important factor to improve breast awareness.A woman can recognize and evaluate any changes

in her body by BSE, and she may receive the necessary treatment and care at an early stage. It may be suggested depending on these results that nurses gain basic knowledge and skills BSE practice to be a role model for other women in the society, and organize appropriate training programs in order to encourage BSE awareness and practices. It can be suggested to managers that BSE trainings should be repeated at regular intervals, the effectiveness of the trainings should be evaluated, and campaigns with widespread effects that could reach large audiences should be organized.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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