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The Effect of Education on the Early Diagnosis of Breast and Cervix Cancer on the Women's Attitudes and Behaviors Regarding Participating in Screening Programs

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Abstract The objective of this paper was to define the effect of education on the early diagnosis of breast and cervix cancer on the women s attitudes and behaviors regarding participating in Cancer Early Diagnosis, Screening and Training Centers-CEDSTC screening programs. This semi-experimental study was completed with 342 women. The data were collected with forms "Champion's Health Belief Model Scale Breast Cancer-HBMSBC" and "Health Belief Model Scale for Cervical Cancer and the Pap Smear Test-HBMSCCPST." When the women's health beliefs before and after 6 months of the education about the early diagnosis of breast and cervical cancers are considered, it is seen that the HBMSBC subscales health motivation, breast self-examination (BSE), and evasion to mammography (MMG) decreased and BSE self-efficacy and MMG benefit attitudes increased and HBMSCCPST subscales pap smear benefit attitudes increased and evasion to pap smear attitude decreased ($p < 0.05$). Six months after the education, 28.4% of the women had undergone MMG, 69.9% had performed BSE, and 33.6% had undergone a pap smear test. Education regarding early diagnosis of breast and cervix cancer was found to have positive effects on the health behaviors of the women related to BSE, MMG, and pap smear tests. The women require professional education program for increasing their attitudes and behaviors for CEDSTC screening programs. We suggest regularly providing education to increase participation in early screening programs.

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Keywords Breast cancer · Cervical cancer · Education · Attitude · Rural population

Introduction

Breast and cervical cancers are common in women and can be detected at the early stage with screening programs [1]. Breast cancer is the most common cancer and the most common cause of death in females worldwide [2, 3]. The 2012 data for Turkey indicate an age-standardized breast cancer rate of 46.8 [4]. The International Agency for Research on Cancer (IARC) states a 5-year prevalence of 186.95, incidence of 39.10, and mortality rate of 13.44 per 100,000 females in Turkey for breast cancer [4]. Cervical cancer is the most common female cancer in Sub-Saharan Africa and South Asia and the second most common female cancer worldwide [3]. Cervix cancer ranks tenth in Turkey among all cancers (4.5/100,000) according to the age-standardized rate [5]. Breast self-examination (BSE) in women, clinical breast examination (CBE), and mammography (MMG) are recommended for the early diagnosis of breast cancer and the pap smear test for the early diagnosis of cervical cancer [6–9].

Various countries have created national action plans for the early diagnosis and control of cancer to reveal the problems on a national scale while taking the regional differences into account in line with the existing facilities [10]. The National Cancer Control Program has been conducted in Turkey since 2008 to decrease cancer-related mortality and morbidity through the implementation of evidence-based strategies towards prevention, early detection, diagnosis, treatment, and palliative care and to improve the quality of life of cancer patients. The decision on which cancers to use screening programs for in Turkey is made mainly according to the criteria defined by the World Health Organization (WHO) and also considering whether the method to be used will decrease the cancer load in the country and become an integral part of the program. Accordingly, population-based screening programs aimed at early diagnosis are currently in use for breast, cervix, and colon cancer in our country. Cancer screenings for breast and cervical cancer are conducted by the Cancer Early Diagnosis, Screening and Training Centers (CEDSTC) located in 81 provinces in our country. Free screening services are provided for breast cancer with MMG to women aged 40–69 years and for cervical cancer with the pap smear test to women aged 30–65 years at these CEDSTCs [5].

Although there are screening services for the early diagnosis of breast and cervical cancer in Turkey, the percentage of women undergoing these tests is not at the desired level [5, 11]. A minimum of 70% of the target population should be reached for effective cancer screening. However, the coverage is 20–30% for breast cancer screening and 20% for cervical cancer in Turkey [5].

Healthcare professionals have important roles in determining the factors preventing women from participating in cancer early diagnosis screening programs and the development of preventive strategic activities [10, 12]. The first step in increasing the participation of women in early screening programs is to raise their awareness of cancer. Interventions to raise awareness will be useful in increasing the awareness of women regarding the early diagnosis of cancer and in providing the necessary motivation for their participation in screening programs [5, 13]. The WHO emphasizes that the target population should be trained for a public health program conducted for the early diagnosis of cancer to be effective [10]. Education on the subject of breast and cervical cancer is reported to increase awareness and affect the belief, attitude, and behaviors of women regarding their participation in early screening programs [14–17]. This study was therefore conducted to identify the effect of education on the early diagnosis of breast and cervix cancer on the women s attitudes and behaviors regarding participating in screening programs.

Material and Methods

Study Design and Population

This semi-experimental (preliminary test-final test in a single group) study was conducted at the Cancer Early Diagnosis, Screening and Training Center (CEDSTC) of Niğde Public Health Directorate and the villages and towns of the province center where it serves. The total female population living in the villages and towns of Central and Yesilgolcuk districts of Niğde Province Center is 99,767 (village: 40,842; city: 58,925) [18]. All women living in the 40 villages and towns that could be reached (from the 51 villages and towns of Niğde province center) and were able to participate in the education programs to be conducted towards the early diagnosis of breast and cervical cancer formed the population of the study. No sample selection was conducted, and all women who were living in these villages and towns were aged 18 years and above, participated in the education provided by the investigators towards the early diagnosis of breast and cervical cancer, were able to answer the question forms and scales, who had not been included in the preliminary implementation, and accepted to participate in the study by providing written consent were included in the study sample. A total of 11 villages and towns within the scope of the study could not be visited due to one town becoming administratively connected to Niğde province Center, and the remaining 10 villages due to the lack of sufficient interest of women despite our announcement that they would be visited for education, lack of appropriate education and data collection places, lack

of interest by the trainers in the courses where the education was conducted, low population in certain villages, and education having been given in certain villages recently by healthcare professionals not included in the study team. A total of 1041 women who met the study inclusion criteria were asked to participate in the study at the first instance. However, only a total of 1037 women could be reached due to one woman not hearing well, and three accepting the study at the beginning but then refusing to participate while completing the data collection forms. Of these, 27 women s data collection forms were incomplete, and the first evaluation of the study was completed with 1010 women. A total of 30 women could not be reached at the follow-up as two women were sick and 8 were away and 20 had moved to another residential area. An announcement for participation in the education was made to 980 of the 1010 women whose first evaluation was performed. Of the remaining 980 women, 373 stated that they would come to the location of the second evaluation. However, the study was completed with 342 women in 39 villages and towns in the end because 10 of them did not complete the data collection forms sent to their house, 10 had incomplete data collection forms, and two refused to participate in the study (Fig. 1). The state of the women who participated or did not participate in the second follow-up of the study was evaluated according to socio-demographic characteristics, risk factors, and other confounders. We found no difference between the women who participated and did not participate in the second follow-up of the study for any factor or characteristic ($p > 0.05$) other than the educational level of the woman and the husband. Although we asked all women to voluntarily participate in the second follow-up in both the towns and villages without any discrimination, women from couples where the woman and the husband were university graduates participated at higher rates.

Data Collection Tools

The data were collected using the "Data Collection Form," "Data Collection Form Six Months After Education on the Early Diagnosis of Breast and Cervical Cancer," "Breast Cancer Risk Evaluation Form," "Champion's Health Belief Model Scale (CHBMS)," and Health Belief Model Scale for Cervical Cancer and the Pap-smear Test (HBMSCCPST) developed by the investigators through a literature review [1, 6–8, 14, 16].

Data Collection Form This form consisted of two parts as "socio-demographic characteristics" and "risk factors" of the women. A total of 41 questions including 12 questions on the socio-demographic characteristics of the women (age, educational status, marital and working status, occupation, social security presence, income status of herself and the spouse, the individuals living at home, etc.) and 29 questions on breast and cervical cancer risk factors (first menstruation, marriage, pregnancy, age, pregnancy, parity and number of abortions, breast feeding, use of oral contraceptives, genital warts [human papilloma virus—HPV] and presence of sexually transmitted diseases, menopause, weight gain, pap-smear, etc.) were included in the form.

Breast Cancer Risk Evaluation Form This form is developed by the American Cancer Association and has been accepted and recommended by the Ministry of Health in Turkey. The form consists of 6 parts and 20 items including age, family and personal history of breast cancer, childbearing age, menstrual history, and physical structure. The individual breast cancer risk level is calculated according to the scores obtained. The scores are grouped in four categories (200 and below = low risk, 201–300 = moderate risk, 301–400 = high risk, 400 and above = highest risk) [19].

Champion's Health Belief Model Scale This scale was developed by Victoria Champion in 1984 to be used in breast cancer screenings and was revised in 1993, 1997, and 1999 [20–22]. The adaptation of this scale that evaluated the beliefs of women regarding breast cancer, BSE, and MMG within the scope of the health belief model (HBM) was conducted simultaneously in three different studies that were unaware of each other in our country [23]. The validity and reliability study of the CHBMS used in this study were conducted by Gozum and Aydin (2004) [24]. HBSM is a 52-item, self-report measure, representing 8 scales: susceptibility (3 items), seriousness (6 items), benefits of BSE (4 items), barriers of BSE (8 items), confidence (10 items), health motivation (5 items), benefits of MMG (5 items), and barriers of MMG (11 items). This scale's inner consistency (Cronbach alpha value) coefficient varies between 0.69 and 0.83 [24]. All the items have 5 response choices ranging from strong disagreement (1 point) to strong agreement (5 points). All scales are positively related to screening behavior, except for barriers that are negatively associated. Each subscale is evaluated separately and a single total is not used. Increased scores indicate higher susceptibility and seriousness, higher benefit perception for benefits, and higher barrier perception for barriers [23]. Cronbach alpha values of the scale's subscales in our study were 0.82–0.88 at the first evaluation and 0.79–0.88 at the second evaluation.

Health Belief Model Scale for Cervical Cancer and the Pap Smear Test This scale was developed from Champion's breast health research and used to identify the beliefs of women regarding cervical cancer and screenings [25]. The validity and reliability of the scale in Turkey were tested by Guvenc et al. (2011) [25]. We used HBMSCCPST, for which the Turkish validity and reliability was conducted by Guvenc et al. (2011), in our study [25]. HBMSCCPST

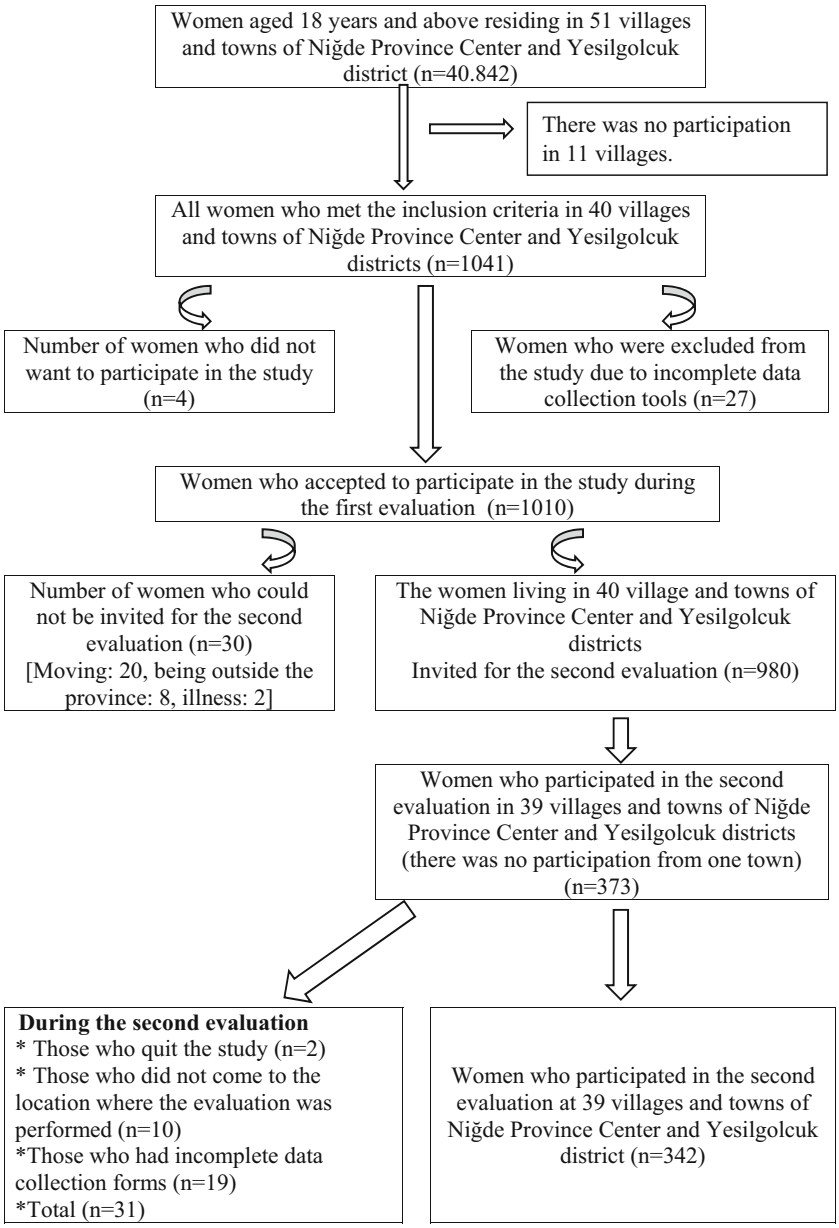

Fig. 1 Sample selection and flow chart of the study

consists of five subscales and 35 items consisting of "susceptibility (3 items)," "seriousness (7 items)," "health motivation (3 items)," "pap-smear benefits/health motivation (8 items)," and "pap-smear barriers (14 items)". As in CHBMS, the evaluation is with a 5-point Likert-type scale method in the form of "I definitely disagree (1)," "I disagree (2)," "I neither agree nor disagree (3)," "I agree (4)," and "I definitely agree (5)" being scored from one to five. Each subscale is evaluated separately and without a total score. Guvenc et al. (2011) found the Cronbach alpha value of the scale to be between 0.62 and 0.86. HBMSCCPST subscales' Cronbach values were found to vary between 0.58 and 0.93 during the first evaluation and 0.58 and 0.88 during the second evaluation.

The Data Collection Form Used Six Months After Education for the Early Diagnosis of Breast and Cervical Cancer This form included 16 questions on whether the education had affected the subject s opinion regarding participation in early screening programs, the status of having recent screening tests (BSE, MMG, and pap smear) and what the result was if available, reasons if the test had not been done, and thoughts on future participation in these programs.

Data Collection

The study was conducted in two stages (first evaluation and second evaluation). After the necessary permissions were

obtained for the implementation of the study, the locations in the 40 villages and towns where the evaluations would be performed were called by phone and appointments were made. The first evaluation of the study was conducted between 13/02/2013 and 27/12/2013. Education regarding how to administer the questionnaire was provided to two persons consisting of a midwife and/or nurse working at CEDSTC by the investigators. The investigators went to the study location at the villages and towns at the relevant time together with students who were studying in the healthcare field at the university. The implementation of the study was mostly conducted in classrooms for Koran courses, mosques, primary schools and cafés. An announcement was made for the women by the educators of the Koran Course and village headmen for their participation in the education on the early diagnosis of breast cancer and cervical cancer on the day of the study. The women who came to participate in the education for the early diagnosis of breast and cervical cancer were provided information on the aim, method, and expected benefits of the study by the investigators, and they were asked to participate in the study voluntarily. They then signed an informed consent form.

Before the education on the early diagnosis of breast and cervical cancer, the women included in the study were administered data collection forms and scales. The completion of the forms and the scales was conducted with the face-to-face interview method and completing the forms individually and lasted about 30 min. Theoretical and practical education lasting a total of 60 min (30 min for breast cancer, 10 min for the examination of normal and abnormal breast tissue on models, 20 min for cervix cancer) was conducted for all women who participated in the study or not by the investigator accompanied by a visual presentation on the early diagnosis of breast and cervical cancer after the forms and scales were administered. The education subjects included the normal anatomic structure of the breast, abnormal changes in the breast, importance of breast cancer, risk factors, symptoms, early diagnosis, treatment, BSE, anatomic structure of female reproductive organs, importance of cervical cancer, risk factors, symptoms, early diagnosis, treatment, the pap smear test, centers for the early diagnosis of breast and cervical cancer, and activities of Niğde CEDSTC. All women were asked to perform a BSE together with the investigators during the education, and examples were provided regarding how the normal and abnormal breast feels with the help of models. All women who participated in the education were asked to examine the models in order to understand normal tissue and breast masses. After all education was completed, an education brochure prepared by Niğde Province CEDSTC on breast, cervical, and general cancer and their screening was distributed to the women, and they were asked to participate in screening programs.

The second stage of the study was conducted about 6 months later once permission was again obtained from the necessary authorities. The Koran Course educators, village headmen, and mosque hodjas (religious functionaries) were called by phone and informed that the second evaluation would be performed in line with the planned program by the investigators and they were asked to make announcements and to determine the location where the study could be conducted. The women living in these villages and towns and who accepted to participate in the study were administered the data collection form and scales again by the investigators within approximately 25 min. Since the participation of the women could not be provided despite the announcement of the headman of the village in one of the villages where the study was conducted, the second evaluation of women took place in a total of 39 villages and towns on 25/06/2014.

Data Analysis

The data obtained from the study were analyzed with the IBM SPSS Statistics 22 software. Number, percentage, standard deviation, mean, median, and minimum-maximum values were used in the evaluation of descriptive statistics. Whether a difference was present between two independent groups was examined with the independent sample t test and the Mann-Whitney U test. Whether a difference was present between more than two independent groups was evaluated with one-way variance analysis (ANOVA) and the Kruskal-Wallis test. The t test and Wilcoxon analysis were used for dependent groups in the comparison of the scores obtained from the subscales of the scale at the first and second evaluation. The reliability of the subscales of the scale was examined with their Cronbach alpha coefficient. The statistical significance of the results was evaluated at the $p < 0.05$ level in the comparison of the groups.

Ethical Considerations

Ethics committee approval was obtained from the Niğde University Ethics Committee (No: B.30.2.NGU.0.03.00/050/27, decision no: 2012/07/01, date: 28/03/2012), Project approval from the Niğde University Scientific Research Project Unit, and written permission from the Niğde Governorship, Niğde Provincial Health Directorate and Niğde Public Health Directorate for the study. We also obtained written consent from the participants covering subjects such as the aim of the study, voluntary participation and protection of confidentiality and privacy in accordance with the Helsinki Declaration.

Results

The mean age of the women included in the study and their spouses was 44.41 ± 11.74 and 46.6 ± 11.3 years, respectively. The majority of the women were in the 30–40 years age group (34.5%), 90.1% were married, 91.8% were not working, 22.1% were not literate, 56.1% were primary school graduates, and the economic status of 64.3% was moderate. A family history of cancer was reported by 10.2% of the women while 94.2% did not smoke and 79.8% did not perform exercise. Among the spouses of the married women, 62.4% were primary school graduates and 67.3% were working actively. Among the women themselves, 34.2% said they were menopausal, 50.4% had gained weight after entering the menopause, 2.9% had never become pregnant, 58.8% had become pregnant four times or more, 44.4% had given birth four times or more, 95.6% had breastfed their infants during the postpartum period, 22.8% were using birth control pills, and 83.8% had received hormone replacement therapy (HRT) (Table 1).

When certain risk factors regarding cervical cancer were evaluated, we found that 32.5% of the women had experienced an abortion and 90.1% had a miscarriage, 58.5% had sexual intercourse at the age of 18 or below, 4.7% had bleeding during sexual intercourse, 52.9% used a vaginal douche, 2.9% had genital warts, and 2.0% had a history of sexually transmitted diseases (STDs) (Table 1).

Evaluation of the breast cancer risk of the women revealed that 2.9% had a history of cancer in the mother, 2.0% had a history of cancer, 1.8% had given birth after the age of 30, 3.5% had the first menstruation at the age of 11 or less, and 36.5% were overweight. While 94.2% of the women included in the study were found to have low risk in terms of breast cancer, 1.8% were included in the high-risk group (Table 1).

No statistically significant difference was found between the low- and high-risk groups in terms of breast cancer for the mean or mean rank of the CHBMS subscales except attaching seriousness ($Z = -2.257$; $p = 0.024$) of CHBMS at the first evaluation of the study ($p < 0.05$). A statistically significant difference was found between the mean rank of the health motivation subscales of CHBMS and the breast cancer risk groups at the second evaluation ($Z = -1.976$; $p = 0.048$) ($p < 0.05$) (Table 2).

The comparison of the scores of women at first and second evaluation for the CHBMS subscales is presented at Table 2. The median for the health motivation was 19.86 at the first evaluation, decreasing to 19.15 at the second evaluation. According to the mean scores obtained by the women from CHBMS before and after the education, the susceptibility, benefits of BSE, confidence (BSE) self-efficiency, and benefits of MMG perceptions increased while the attaching seriousness, barriers of BSE, and barriers of MMG decreased. A statistically significant difference was found between the first and second evaluation regarding the subscales of CHBMS except sensitivity, attaching seriousness, and benefits of BSE ($p < 0.05$) (Table 2).

Table 1 The distribution of socio-demographic characteristics of the women and their spouses

Socio-demographic characteristics	*n*	%
Age (year)	$\bar{X}$ ±SD = 44.47 ± 1.17	Min-Max = 19–74
Age group		
30	33	9.6
30–40	118	34.5
41–50	87	25.4
51–60	66	19.3
>60	38	11.1
Marital status		
Married	309	90.1
Widow-divorced	32	9.3
Single	2	0.6
Educational status		
Not literate	77	22.5
Literate	34	9.9
Primary school	192	56.1
Secondary school	16	4.7
High school	9	2.6
Undergraduate and above	14	4.1
Working status		
Working	28	8.2
Not working	314	91.8
Social security		
Yes	256	74.9
No	86	25.1
Economic status		
Very good	5	1.5
Good	54	15.8
Moderate	220	64.3
Poor	51	14.9
Very poor	12	3.5
Smoking		
Yes	10	2.9
No	322	94.2
Has quit	10	2.9
Family history of cancer		
Yes	35	10.2
No	300	87.7
Does not know	7	2.0
The age of the spouse (years) (n = 340)	$\bar{X}$ ±SD = 46.6 ± 11.3	Min-Max = 25–80
Educational status of the spouse		
Not literate	37	10.9
Literate	21	6.2
Primary school	212	62.4
Secondary school	29	8.5
High school	22	6.4
Undergraduate and above	19	5.6
Working status of the spouse		
Working	229	67.3
Not working	111	32.7

The comparison of the HBMSCCPST subscale scores from the first and second evaluation is presented at Table 2. The mean scores obtained by the women from sensitivity, seriousness, and health motivation subscales of HBMSCCPST in the second evaluation were found to be lower than the scores at the first evaluation but without statistical significance ($p > 0.05$). While the mean score obtained from the pap smear benefits/health motivation subscale was 31.22 ± 5.601 at the first evaluation, this increased statistically significantly to 32.55 ± 4.963 ($p < 0.05$). A decrease occurred in pap smear barriers at the second evaluation ($\bar{X} \pm SS$ = 39.71 ± 8.382) compared to the first evaluation ($\bar{X} \pm SS$ = 37.65 ± 8.656) with a statistically significant difference ($p < 0.05$) (Table 3).

We found that 28.4% of the women underwent MMG, 69.9% performed BSE, and 33.6% had a pap smear test in the 6 months after the education for the early diagnosis of breast and cervical cancer. An MMG had not been requested by 22.4% of the women as they did not have any symptom or disorder and by 27.8% because they could not spare the time or neglected the issue. BSE was performed in the bath by 29.3% of the women, once a month in 25.9% and whenever it was remembered in 41.0%. The reasons why women did not perform BSE were lack of any symptom or disorder in 18.5%, being afraid of a bad result or a cancer diagnosis in 5.8% and not having the time or neglect in 53.4%. The reason for not having a pap smear test was the lack of any symptom or disorder in 31.7%, having had a test recently in 13.2%, and not having the time or neglect in 33.9% (Table 4).

Discussion

The calculation of breast cancer risk is important in increasing women's awareness of breast cancer risk and their participation in early screening programs [26]. It is reported that the individuals sensitive to the notion that the disease could harm them believe that the negative effects that could occur will decrease when they take action [27]. Although not included in the study, the mean scores of women at high risk in terms of breast cancer were found to be high for all subscales of CHBMS except barriers of MMG in our study. Women at high risk were found to take breast cancer statistically significantly more seriously at first evaluation and their health motivation to be higher at the second evaluation. However, no statistically significant difference was found between the women with low and high risk after education in terms of undergoing MMG ($X^2 = 0.0001$, $p = 0.0001$). A MMG had not been performed in 71.7% of the women in the low-risk group for breast cancer. This rate was 70% in the high-risk group. No difference was found between the women included in the low- and high-risk groups for breast cancer for 5 years and for life according to the Gail model in terms of their compliance with the education programs in the study of Acıkgoz and Ergor (2013) [26]. This result is similar to the findings of our study.

Many studies have arranged various education interventions to eliminate the obstacles to the participation of women in screening programs [17]. Such studies have emphasized that the education provided will create awareness

Table 2 The comparison of the scores obtained by women from the subscales of CHBMS at first and second evaluation

Subscales of the scale	*n*	Median	Min	Max	*Z*	*p*
First evaluation health motivation	342	19.86	5.00	25.00	−2.148	0.032[a]
Second evaluation health motivation	342	19.15	5.00	25.00		
	n	$\bar{X}$	*SS*		*t*	*p*
First evaluation susceptibility	342	7.98	2.47		−1.169	0.243[b]
Second evaluation susceptibility	342	8.16	2.43			
First evaluation seriousness	342	21.42	5.22		0.178	0.858[b]
Second evaluation seriousness	342	21.36	5.05			
First evaluation benefits of BSE	342	15.21	3.06		−0.795	0.427[b]
Second evaluation benefits of BSE	342	15.39	3.21			
First evaluation barriers of BSE	342	18.96	5.63		2.718	0.007[b]
Second evaluation barriers of BSE	342	17.92	5.20			
First evaluation confidence (BSE) self-efficiency	342	32.11	7.76		−6.581	<0.0001[b]
Second evaluation confidence (BSE) self-efficiency	342	35.68	7.13			
First evaluation benefits of MMG	342	18.72	3.61		−2.647	0.008[b]
Second evaluation benefits of MMG	342	19.38	3.25			
First evaluation barriers of MMG	342	28.47	6.78		3.410	0.001[b]
Second evaluation barriers of MMG	342	26.81	6.98			

[a] Wilcoxon analysis was used

[b] Dependent sample *t* test was used

Table 3 The comparison of the scores obtained by women from the subscales of HBMSCCPST at first and second evaluation

Subscale of the scale	*n*	$\bar{X}$	*SS*	*t*	*p*[a]
First evaluation susceptibility	342	8.21	2.427	1.579	0.115
Second evaluation susceptibility	342	7.95	2.256		
First evaluation seriousness	342	25.61	5.321	0.483	0.629
Second evaluation seriousness	342	25.44	5.510		
First evaluation health motivation	342	8.81	2.421	0.345	0.730
Second evaluation health motivation	342	8.75	2.497		
First evaluation pap smear benefits/health motivation	342	31.22	5.601	−3.405	0.001
Second evaluation pap smear benefits/health motivation	342	32.55	4.963		
First evaluation pap smear barriers	342	39.71	8.382	3.663	<0.0001
Second evaluation pap smear barriers	342	37.65	8.656		

[a] The dependent sample *t* test was used

regarding the early diagnosis of breast cancer in the women; create a positive change in their beliefs, attitudes, and behaviors; and increase their participation in screening programs [14, 16, 17]. Six months after the education given towards the early diagnosis of breast cancer in our study, we found that the health motivations of the women, one of the health beliefs, decreased statistically significantly while obstacles to performing BSE and undergoing MMG decreased and they started to believe more in the benefits of MMG ($p < 0.05$). The mean scores obtained by women aged 50–70 years from the susceptibility, seriousness, health motivation, and benefits of MMG subscales of CHBMS were found to increase statistically significantly and the barriers of MMG to decrease 6 months after the breast cancer education in the single group pattern semi-experimental study of Mermer and Turk (2014) [28]. Susceptibility, seriousness, and barriers of BSE perception of the women were found to decrease and benefits of BSE and confidence (BSE) self-efficiency perceptions to increase 3 months after education on breast cancer compared to the beginning in another single-group pattern semi-experimental study conducted in the field of public health center service. Besides, a statistically significant difference was found between the scores obtained from the seriousness, benefits of BSE and confidence (BSE) self-efficiency subscales before and after education [29]. Sensitivity, seriousness, health motivation, BSE confidence (BSE) self-efficiency, and benefits of BSE perceptions of women were found to increase and barriers of BSE perception to decrease after the breast cancer education given in a semi-experimental study conducted at a public education center in Turkey [30]. Results similar to those of Hacihasanoglu and Gozum (2008) were obtained in the intervention group women in a society-based controlled study conducted in Iran [31]. It is obvious that education on breast cancer created a change in the health beliefs of women in all the studies presented above [28–31]. All the health beliefs of the women in this study other than health motivation and also their perceptions of seriousness showed a positive change. The decrease of the median and mean scores obtained from the health motivation and seriousness subscales of CHBMS indicates that the education given is not sufficient to change the beliefs of the women on this issue. We believe that the health motivation and seriousness perceptions of the majority of women did not change at the requested level due to the low education and income levels, lack of social security, not being able to make decisions (including those in the health care field) by themselves, the villages and towns being far from the city center, transportation problems, and having a fatalistic approach. The women need to believe that they could also have cancer so that they take the situation seriously and become motivated to perform behaviors related to early diagnosis of the disease to ensure increased participation in early screening programs of breast cancer. Therefore, determining the factors that may affect the health motivation and seriousness perception of women positively and making the necessary interventions could be useful in increasing participation in screening programs.

Cervical cancer is a cancer type with known etiology where a cure is possible with screening and early diagnosis. The process of conversion into cancer takes 10 to 20 years, making it possible to detect the lesion at the early stage with screening programs and prevent related deaths. It is therefore important for women to participate in cervical cancer screening programs [5]. Education is reported to play a role in increased participation of women in cervical cancer early diagnosis programs and the development of positive health behaviors [3, 17, 20]. It is emphasized that education is effective in stimulating positive health behaviors by affecting the beliefs of the individuals [3, 17]. Evaluation of the health beliefs of the women 6 months after education towards the early diagnosis of cervical cancer revealed increased pap smear benefits/health motivation perceptions and decreased pap smear barrier perceptions compared to the first evaluation ($p < 0.05$) (Table 3). An improvement was found in the susceptibility, seriousness, benefit, and

Table 4 The characteristics of women regarding their participation in screening programs after the education conducted towards the early diagnosis of breast and cervical cancer

Status of having mammography after education (n = 342)	Number	%
Had the test	97	28.4
Did not have the test	245	71.6
The reason for not having mammography (n = 245)		
Lack of symptoms or a disorder	55	22.4
Having had a test recently	12	4.9
Being afraid of a bad result or being diagnosed with cancer	12	4.9
Not being able to find time or neglect	68	27.8
Thinking that she is too young to have a mammography test	45	18.4
Other	53	21.6
Status of performing BSE after education (n = 342)		
Performed	239	69.9
Does not perform	103	30.1
BSE Frequency (n = 239)		
At every bath	70	29.3
Once a month	62	25.9
Once every 6 months	5	2.1
Once a year	4	1.7
Whenever it comes to my mind	98	41.0
The reason for not performing BSE (n = 103)		
Lack of any symptom or disorder	19	18.5
Having had a test recently	2	1.9
Being afraid of a bad result or being diagnosed with cancer	6	5.8
Not being able to find time or neglect	55	53.4
Other	21	20.4
Status of having a pap smear after education (n = 342)		
Yes	115	33.6
No	227	66.4
The reason for not having a pap smear test after education (n = 227)		
Lack of any symptom or disorder	72	31.7
Having had a test recently	30	13.2
Being afraid of a bad result or being diagnosed with cancer	10	4.4
Not being able to find time or neglect	77	33.9
Hesitating or being ashamed of having a gynecologic examination	6	2.6
Thinking that the pap smear test will be painful	3	1.3
Thinking that she is too young to have a pap smear test	2	0.9
Other	27	12.0

barrier perceptions of the women after the education towards cancer in a semi-experimental study conducted in Iran [32]. Seriousness, susceptibility, and pap smear benefit perceptions of the women were reported to increase and pap smear barrier perception to decrease 1 month after education towards cervical cancer in another semi-experimental study conducted in Iran [33]. A prospective, randomized controlled study conducted in our country showed that the pap smear benefit perception of women increased and barrier perception decreased after the education [7]. Our study results are similar to the results of Bebis et al. [7]. Although not in the table, we also found that pap smear benefits/health motivation perceptions of women who had a pap smear test after t education was high and pap smear barrier perceptions were low in our study ($p < 0.05$). This suggests that when women believe the benefits of the pap smear test, the obstacles towards not having the test will decrease and the rates of having the test will increase. Education that increases the benefit perception of women regarding regular pap smear tests can positively affect their participation in cervical cancer screening programs.

Performing BSE in screening programs is no longer recommended [34], but it is reported to be useful in terms of the women being informed on normal breast tissue and to

increase their awareness of breast cancer [35]. The use of materials such as a breast model, videos, and brochures during education is reported to increase BSE frequency and implementation skills in studies [14, 36]. Although not included in the table, 60.2% of the women stated that they knew BSE and 48.0% that they were able to perform this examination correctly at the evaluation. Six months after the training, 75.2% of women stated that they knew BSE and 68.1% that they could perform this examination correctly. A statistically significant difference was found between knowing BSE ($p = 0.042$) and performing it correctly ($p < 0.0001$) between the first and second evaluations ($p < 0.05$). Besides, 69.9% of the women stated that they had performed BSE after the education (Table 3). Karayurt et al. have reported that the rate of performing regular BSE increased from 25.9 to 55.7% following peer education and from 45.5 to 62.2% following group education after 6 months [37]. An increase was found in the BSE implementation rate of women after education in a semi-experimental study conducted in İzmir [28]. Similar to the findings of the above-mentioned study [28, 37], the knowledge and implementations of women regarding BSE were found to increase after the education in our study.

Screening for cervical cancer is performed for free every 5 years according to the national cancer screening programs in our country [5]. Although not included in the table, 36% of the women had received information on the pap smear test and 39.8% had undergone this test at least once before our study was conducted. Our study showed that 33.6% of the women had undergone a pap smear test after the education and 13.2% of those who did not have the test done had not participated in the cancer screening program because they had the test done recently (Table 4). Only 16.3% of women aged 25–29 years were found to have had a pap smear test after the education on the risk factors and prevention of cervical cancer by midwives in the study of Yucel et al. [38]. The probability of having pap smear test done in the intervention group was found to increase 1.5 times (67%), although without significance, after education was provided by public health employees in the study of Nuño et al. [39]. Bebis et al. reported that 12.3% of the women in the intervention group participated in cervical cancer screening programs including pap smear within 3 months after the education in their study [7]. The rate of women having a pap smear test done after the education was seen to vary with different methods and study populations in the studies above [7, 38, 39]. The rate of women having a pap smear test done after the education in our study was higher than the results of two other studies [7, 38] on this subject from our country. According to the results obtained from our study and other studies [7, 38, 39], education has a positive effect on the participation of women in cervical cancer screening, although the rates of having a pap smear test done vary.

Limitations of the Study

We included women living in the 40 towns and villages of the Center and Yesilgolcuk districts of the Niğde province Center Town after they participated in the educational programs on early diagnosis of breast and cervix cancer and we made sure that they met the study criteria. The results of the study after the second follow-up can therefore only be generalized to the women living in the 39 villages and towns of the Niğde province Center Town. Although we reached 1010 women in the first follow-up, the number decreased to 342 in the second follow-up. We believe that some of the influencing factors in this decrease were lack of a proper environment for providing education and the data collection in the towns and villages where the study was conducted, the lack of interest or willingness by some Quran course educators on our conducting the study where they worked and their negative influence on the participants with their fatalistic world view, the closure of schools and Quran courses during the summer period, the fact that most of the women worked in farming-related tasks in the spring and summer months, the lack of adequate education for completing the data forms, the inability of the women to make decisions by themselves due to the societal gender roles assigned to them by their community, and the problems related to transportation and economic power. The distance of the towns and villages of the Niğde province Center Town to the CEDSTC building in the city center, the fact that only the pap smear test and clinical breast examination were performed at this center while the women were directed to the state hospital for MMG screening and the results could only be obtained after 3 months due to the scarcity of radiologists have also decreased the number in the study sample.

Conclusion

According to the results, we obtained from our study that providing education towards the early diagnosis of breast and cervical cancer leads to positive changes in the health beliefs of women regarding BSE, MMG, and pap smear tests. Besides, one in four women participated in the breast and cervical cancer screening program after the training. However, education alone was found not to create a change in the desired direction in women s health motivation, susceptibility, and seriousness perceptions regarding the early diagnosis of breast cancer. Performing qualitative and quantitative studies on the factors that may increase women's health motivation, susceptibility, and seriousness and investigating the effects of education with different methods such as peer education and home visits to small groups to be conducted in villages and towns on the participation in screening programs and health beliefs, repeating such education

regularly to make a positive change in the health beliefs of these women and convert them into permanent behavior changes will be useful according to these findings. Besides, new arrangements such as the use of mobile health vehicles that will allow screenings to be performed in locations where the women reside and performing these tests at family health centers are recommended for those who want to participate in early screening programs but are unable due to reasons such as socio-economic status, not being able to make their own decisions because of social gender roles, and intense agricultural activities.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest.

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