

# Determination of Knowledge and Behavior of Women Working at a Hospital on Breast Cancer Early Detection Methods, and Investigation of Efficiency of Planned Education

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## ABSTRACT

**Objective:** This study aimed to evaluate knowledge and attitude of women working in the hospital on breast cancer, their behaviors related to early diagnostic methods, and to determine the effectiveness of training in order to increase awareness on breast cancer.

**Materials and Methods:** The study group consisted of women working in the Dokuz Eylül University Hospital. The data of this cross-sectional study were collected by a questionnaire. Within the scope of this study, a training program on breast cancer was organized. The effectiveness of this training was evaluated by a preliminary survey and a final survey. Data were expressed as number and percentage, and paired t test and chi-square test were used for comparison.

**Results:** 161 women participated in the study with a mean age of  $35 \pm 8$ . It was determined that 81.4% of women knew early diagnosis and screening methods for breast cancer. 49.1% of women stated that they perform breast self-examination, but only 6.2% practiced it once a month. 32.9% of women had clinical breast examination, 22.4% had a breast ultrasound, and 22.3% had mammography. Most of the women did not perform any of these methods. The average knowledge level of women was significantly increased after completion of the planned training as compared to pre-training levels ( $p < 0.001$ ).

**Conclusion:** It was determined that the majority of women were informed on breast cancer early diagnosis and screening methods, but did not practice these methods on themselves. Information and awareness of women against breast cancer have increased with the use of planned training programs on breast cancer, early detection and screening methods.

**Keywords:** Breast cancer, early diagnosis, screening, training program

## Introduction

Breast cancer is the most common cancer and the leading cause of death in women around the world and in our country (1-3). Breast cancer starts with uncontrolled proliferation of cells and structures in breast tissue. The most important factor that determines the prognosis of the disease is early diagnosis. Although breast cancer is common in women, with early detection, it can be treated with quite successful results and cancer mortality can be reduced. The diagnosis of breast cancer can be easily made by early detection and screening methods and treatment can be initiated early (4-6).

It is well-known that with regular use of early diagnosis and screening methods, and with timely and effective treatment options breast cancer survival rates have increased in developed countries (5,7). Early diagnosis and screening methods of breast cancer include breast self-examination (BSE), clinical breast examination (CBE) and mammography (4,7-9). The most important method that reduces breast cancer mortality is screening mammography. Early diagnosis by screening mammography resulted in up-to a 30% decrease in mortality (9). However, mammography is an expensive method that requires experienced personnel. Therefore, it is not widely applied in our country. BSE and CBE are known to be useful in increasing awareness of breast cancer in women (4,7,10).

The American Cancer Society and the American Cancer Institute recommend mammography in women older than 40 years as a method of breast cancer screening, even though there are no symptoms (4,6). CBE is recommended in every three years for 20-40 years of age, and once a year above 40 years of age by a trained health personnel, and after the age of 20 particularly in countries where screening programs are inadequate, regular monthly BSE is recommended after explanation of its benefits and limitations by medical personnel (4,6,7). BSE is a recommended method to increase women's awareness, although, its effect on reducing cancer mortality is debated. In the literature, it

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is reported that approximately 80% of breast lumps are initially determined by women themselves (10). Therefore, regular BSE is important so that women can recognize their breast and notice potential changes early, thus leading to early admission to medical institutions.

The Ministry of Health indicated that women should undergo mammography once every two years starting at age 40 (11). In our country, the incidence of breast cancer varies between regions. Western regions have a higher incidence of breast cancer than the east. Western lifestyle and availability to health services is thought to influence this higher incidence. According to the national breast cancer registry program, although varying between regions, about two-thirds of breast cancer cases in our country are under the age of 40 (12,13). While educating women about breast cancer, these information should be kept in mind and early detection methods and their timing and frequency of administration should be explained.

Increasing awareness of the society about breast cancer, and increasing the level of knowledge through planned training programs may provide regular application of early screening and diagnosis methods. Training on breast cancer, causes, symptoms, screening, prevention and early detection issues can increase awareness in the society against breast cancer and may provide early clinical admission in women with or without clinical signs. Therefore, by presenting early diagnosis and appropriate treatment options, the burden of breast cancer on the community can be reduced.

This study aimed to evaluate knowledge and attitude of women working in a university hospital on breast cancer, to detect their behaviors on early diagnostic methods, and to determine the effectiveness of training provided in order to increase awareness against breast cancer.

### Materials and Methods

The study group included women who work as supportive staff and secretary (non-health care workers) at the Dokuz Eylul University Hospital. Written permission was obtained from the Dokuz Eylul University School of Medicine Clinical and Laboratory Studies Ethics Committee. The data of this cross-sectional study were collected by a questionnaire between February–December 2011, after obtaining verbal informed consent from the participants.

The study survey form, pre-training and post-training questionnaires that were generated by the authors based on literature information was used to collect data. Within this research, a planned training program was organized in order to increase breast cancer awareness on breast cancer symptoms, risks, early detection and screening methods, and prevention. In this training program, interactive education and presentation techniques were used as well as breast models and visual materials. In order to evaluate the effectiveness of this training, a pre-survey questionnaire consisting of 10 questions relevant to the educational content and a final questionnaire that included the same questions were prepared and filled-in by the participants. The training sessions lasted for 30 minutes, and twenty women were invited to each session.

The survey questionnaire was filled in by the researchers, on a different day from the day of training, by face-to-face interviews with the participants. The study survey form consisted of questions regarding socio-demographic characteristics of women, information on breast self-examination, clinical breast examination, breast ultrasound and mammography, their status and influencing factors on the application/ not application of these methods.

### Statistical Analysis

SPSS 15.0 (SPSS inc. Chicago, Illinois, USA) statistical software package was used for analysis. For statistical analysis; number, percentage, mean, standard deviation, paired t test, chi-square test, and Mantel-Haenszel chi-square tests were used. p-value less than 0.05 were considered as significant.

### Results

The youngest women who participated in the study was 20 years old, and the oldest was 59 years, with a mean age of  $35.3 \pm 8.9$ . The analysis of socio-demographic characteristics of women revealed that 32.9% of women were in the 20-29 age range, 37.3% in the 30-39 age range, 22.4% in the 40-49 age range, and 7.5% in the 50-59 year range. 24.2% of the participants were educated at primary school, 53.4% at high school, 22.4% were college graduates, and 75.8% were married (Table 1). The majority of women (82.6%) did not have any chronic illness. 9.9% had a family history of breast cancer (Table 2).

It was determined that 81.4% of women knew at least one breast cancer early detection and screening method. 70.2% stated that they had knowledge on BSE, 44.1% on CBE, 46.0% on breast ultrasound, and 64.0% on mammography (Table 3). Women obtained information on breast cancer early detection and screening methods mainly from midwives, nurses or doctors (35.4%) (Table 4). The status of women in early diagnosis and screening methods are presented in table 5. It was detected that only 4.3% of women had CBE, 13.1% had CBE and breast ultrasound, 6.8% had mammography, 6.2% had CBE and mammography, and 9.3% had CBE together with breast ultrasound and mammography. The majority of women (60.2%) did not perform any of the methods indicated (Table 5).

When women who did not perform BSE were asked the reasons for not applying BSE, 52.5% stated that they were unaware, and 43.8% that they neglected the examination. 46.2% of women who did not perform mammography or breast ultrasound stated that they did not know that it should be done, 31.7% that they neglected these methods, and 12.5% that they did not believe in the requirement of these methods (Table 6).

Table 1. Patient sociodemographic characteristics (n=161)

Variable	Number	%
<b>Age group</b>		
20-29	53	32.9
30-39	60	37.3
40-49	36	22.4
50-59	12	7.5
<b>Education status</b>		
Primary school and less	39	24.2
Junior-high school	86	53.4
University and more	36	22.4
<b>Marital status</b>		
Married	122	75.8
Single	20	12.4
Divorced	19	11.8

As depicted in Table 7, 50.9% of women did not perform BSE at all, and only 6.2% performed BSE once a month regularly. 30.2% of those who had CBE had an examination during the past year, while 37.7% stated that more than three years elapsed since their last CBE. The most recent mammogram or breast ultrasound was obtained within the past year in 26.3% of women, between one to two years in 28.1%, within two-to three-years in 15.8%, and more than three years ago in 29.8%. The majority of women received these services from the institutions they work at (Table 7). The mammography or breast ultrasound results were reported as normal in 68.4%, with only very few (3.5%) women requiring breast biopsy (Table 8).

Table 9 presents the average knowledge level of women on breast cancer, in the pre-and post-training period. Women's knowledge on breast cancer was significantly increased after training as compared to pre-training levels ( $p < 0.001$ ).

Analysis of BSE performance status according to socio-demographic characteristics and family history did not detect significant difference in BSE performance between women over 40 years and those under 40 years of age, between high school and higher education level and those with lower education, between single and married women, and between women with and without family history of breast cancer ( $p > 0.05$ ). CBE rates were significantly higher in women over the age of 40 than those under 40 years of age ( $p < 0.01$ ). However, there was no significant difference in CBE performance in terms of education level, marital status or family history ( $p > 0.05$ ). Analysis of undergoing mammography or breast ultrasound in terms of socio-demographic characteristics showed that women over 40 years of age had a significantly higher rate ( $p < 0.01$ ). There was no statistically significant difference in undergoing mammography or breast ultrasound, in terms of education level, marital status and family history ( $p > 0.05$ ) (Table 10). Age was determined as the main independent variable in CBE, mammography or breast ultrasound status. Analysis of family history as a confounding factor showed that family history was not a confounding factor ( $p > 0.05$ ).

## Discussion and Conclusion

Breast cancer is the most common type of cancer in women. Diagnosis at an early stage and appropriate treatment options can be life-saving (4,8). Therefore, in order to detect breast cancer at an early stage both national and international authorities recommend regular BSE after 20 years of age, CBE by specialized physicians, and regular mammography after 40 years of age (1,4,6,9-11).

It was determined that the majority of women who participated in the study (81.4%) knew at least one breast cancer early detection and screening method. A study conducted in Izmir reported 93% awareness on breast cancer early detection and screening methods among women with intermediate socioeconomic level, living in urban areas (14). Since all participants of this study were working in a university hospital, higher rates of awareness were expected on breast cancer early detection and screening methods, due to their ability to obtain information from health care personnel in this regard. Those who were unaware of such methods were younger women and the 50-59 age group with a low level of education. 32.9% of the study group was young adults in the 20-29 age group, and 24.2% were educated at primary school and lower levels, which may have an effect on information regarding breast cancer early detection and screening methods.

The analysis on where/whom did women learn breast cancer early detection and screening methods from showed the highest rate (35.4%)

**Table 2. Presence of comorbidites and family history (n=161)**

Variables	Number	%
Comorbidity*		
Yes	28	17.4
No	133	82.6
Family history of breast cancer		
Yes	16	9.9
No	145	90.1

\*Co-morbidites were accepted as hypertension, diabetes, hypercholesterolemia, asthma, rheumatoid and autoimmune diseases

**Table 3. Knowledge on breast cancer early diagnosis and screening methods (n=161)**

Properties	Number	%
Knowledge on breast cancer early diagnosis and screening methods		
No	30	18.6
Yes	131	81.4
Knowledge status on breast cancer early diagnosis and screening methods		
Information on BSE		
No	48	29.8
Yes	113	70.2
Information on CBE		
No	90	55.9
Yes	71	44.1
Information on breast US		
No	87	54.0
Yes	74	46.0
Information on mammography		
No	58	36.0
Yes	103	64.0

BSE: Breast self examination  
CBE: clinical breast examination  
US: Ultrasonography

**Table 4. Source of information on breast cancer early diagnosis and screening methods**

Source of information on breast cancer early diagnosis and screening methods (n=131)	Number	%
Television-radio	20	12.4
Magazines -hand-outs	18	11.2
Midwives-nurse-doctors	57	35.4
Friend-neighbor	31	19.3
Conference-seminar	5	3.1

**Table 5. Utilization of breast cancer early diagnosis and screening methods**

Properties	Number	%
None	97	60.2
CBE	7	4.3
CBE+US	21	13.1
Mammography	11	6.8
CBE+mammography	10	6.2
CBE+US+mammography	15	9.3
CBE: Clinical breast examination US: Ultrasonography		

**Table 6. Reasons for not performing early diagnosis methods**

Non-performance reasons	Number	%
BSE		
Lack of knowledge	42	52.5
Neglect	35	43.8
Disbelieving in its necessity	5	7.3
Mammography / US		
Lack of knowledge	48	46.2
Neglect	33	31.7
Disbelieving in its necessity	13	12.5
Fear of detecting a mass	2	1.9
Not knowing where to get the test	8	7.7
BSE: Breast self examination US: Ultrasonography		

in midwives, nurses or doctors, and in decreasing order from friends and neighbors (19.3%), magazine-newspaper-brochures (11.2%), television-radio (12.4%), and conference-seminars (3.1%). In different studies, the rate of obtaining information on breast cancer and early detection methods from health personnel ranged between 21.5% and 47.7%, and was mostly ranked within the top three sources of information (14-20). Koç and colleagues (19) found the highest rate of information on BSE to be obtained from the health care team. In two different studies from Istanbul, it was detected that television was the primary source of information followed by newspapers, and magazines, while obtaining information from health care personnel ranked third and fourth (15,20). Dişçigil and colleagues (18) found that majority of women obtained information on breast health from the television, followed by doctors and finally printable media. The finding in our study that health personnel were the main source of information may be due to the participants occupation at a hospital. Being informed by health personnel who are competent to providing accurate information on breast cancer and early detection methods may increase sensitivity of women on this issue. The Ministry of Health aims to increase breast cancer early detection and screening facilities, in reproductive health programs as well as cancer prevention efforts, and primary care. Cancer Early Diagnosis, Screening and Training Center staff are being trained in these matters (11).

**Table 7. Frequency and circumstances of performing early diagnosis and treatment methods**

Properties	Number	%
Regular BSE performance		
None	82	50.9
Irregularly	57	35.4
During every shower	12	7.5
Monthly	10	6.2
Last CBE timing (n=53)		
Within the last year	16	30.2
1-2 years	13	24.5
2-3 years	4	7.6
3 years and more	20	37.7
Last mammography/US timing (n=57)		
Within the last year	15	26.3
1-2 years	16	28.1
2-3 years	9	15.8
3 years and more	17	29.8
Location of last mammography/US		
University hospital	51	89.4
Private Clinics	3	5.3
State Hospital	3	5.3
BSE: Breast self-examination CBE: Clinical breast examination US: Ultrasonography		

**Table 8. Result of last mammography/US**

Result	Number	%
Normal follow-up in 1 year	39	68.4
Normal follow-up in less than 1 year	3	5.3
Fibrocystic breast	4	7.0
Benign tumor	9	15.8
Biopsy suggestion	2	3.5
US: Ultrasonography		

Breast self-examination is a simple, economical and easily applicable method in the early diagnosis of breast cancer. More than two-thirds of women who participated in the study had information on BSE. This finding was higher than the results from studies conducted in Ordu, İstanbul and Kütahya (15, 16, 20-22,), and was lower than the results reported from İzmir (14).

Approximately half of the women who participated in our survey stated that they perform BSE. In studies conducted with communities outside health professionals in Turkey, this ratio was reported between 13.8% and 84.1% (14-17,21-25). The high rate of BSE performance in the study by Özeydin et al (15) as compared to others may be due to the study design that only included the 40-69 year age group. The awareness of this group may be increased due to their being the at-risk age group for breast cancer. In our study, it was detected that the

majority of those who perform BSE, did the examination whenever they remembered to. Regular monthly BSE performance rate was very low (6.2%). In studies conducted in our country, the rate of those performing regular monthly BSE ranged from 4.3% to 38.8% (14-16,21,24,25). Regular BSE performance rates are also quite different in other countries; in South Korea this rate (2.9%) was lower than our rates, in Nigeria a similar rate (7.3%) was reported, whereas in African Americans this was higher (32%) than our rate (26-28).

Fifty-one percent of our study group stated that they never performed BSE. Reasons for lack of BSE were expressed as being unaware (52.5%), followed by neglect and disbelief in its requirement. In a study from İstanbul in women aged 40-69, it was detected that more than two-thirds of women applied BSE (20). The higher rate of BSE performance in the study by Demir Yıldırım and colleagues (20) as compared to our results may be due to the different distribution of age groups in the two studies. Nahcivan and colleagues (29) stated the rate of disbelief in BSE to be higher than our results. In the study by Nahcivan and colleagues (29) the participants filled in the survey whereas in our study the researchers filled in the questionnaires, which may have led to abstaining by participants. Biçen Yılmaz et al (17) reported the reasons for lack of BSE as negligence, not having breast related complaints, lack of information, the fear of detecting a mass and not believing in its requirement. The finding that in our study, lack of information and negligence were the main causes of not applying BSE

suggested that lack of knowledge can be overcome and these habits are likely to be acquired with planned training.

In our study, age, education and socio-demographic characteristics such as marital status did not have an effect on BSE application. Nahcivan and colleagues (29) reported that the level of education did not affect BSE performance, while those under 40 years of age and those who are married applied BSE significantly more. In another study, it was stated that married women and those over 35 years perform BSE more (22), and in another study women over the age of 40, with high level of education and those who are married applied BSE significantly more (24). In a study on African-American women, women in the 40-59 years age group applied BSE significantly more than those who were either younger or older (26). According to national and international resources, women over the age of twenty should perform BSE regularly (5,6,9,11,13,30). Instructing women on the importance and the technique of BSE can provide regular application of BSE.

Forty-four percent of women who participated in the study had knowledge on BSE, 46.0% on breast ultrasound, and 64.0% on mammography. These findings are higher than the results studies from İstanbul and Kütahya (15,16). When practice of these methods were evaluated, 32.9% of women had BSE, 22.4% had breast ultrasound, and 22.3% had mammography. These rates are quite low when compared with women's knowledge level. Although women were informed about methods of early diagnosis, the application of these methods were inadequate. 30.2% of those who had CBE, had the exam in the past year, while 37.7% stated that there was a more than three years elapse. Studies from different countries reported similar rates of regular CBE to our findings (26,27). Analysis of CBE status in terms of socio-demographic characteristics showed that women over 40 years had significantly more CBE as compared to those less than 40 years; however, no statistically significant difference was found in terms of education level and marital status. Dişçiğil et al (18) detected the high-

**Table 9. Average knowledge level before and after training**

	Number	Mean	SD	t	p
Pre-test	122	17.6	3.8	30.1	<0.001
Last-test	122	27.5	2.2		

SD: Standard deviation

**Table 10. Early diagnostic method performance status according to sociodemographic properties**

	BSE			CBE		Mammography/US	
	None n (%)	Once a month n (%)	Irregular n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)
<b>Age group</b>							
20-39	62 (54.9)	7 (6.2)	44 (38.9)	25 (22.1) <sup>†</sup>	88 (77.9)	18 (15.9) <sup>†</sup>	95 (84.1)
≥40	20 (41.7)	3 (6.3)	25 (52.1)	25 (52.1)	23 (47.9)	33 (68.8)	15 (31.3)
<b>Education level</b>							
Junior high-below	63 (51.6)	7 (5.7)	52 (42.6)	41 (33.6)	81 (66.4)	43 (35.2)	79 (64.8)
High school-above	19 (48.7)	3 (7.7)	17 (43.6)	9 (23.1)	30 (76.9)	8 (20.5)	31 (79.5)
<b>Marital status</b>							
Married	63 (51.6)	7 (5.7)	52 (42.6)	41 (33.6)	81 (66.4)	43 (35.2)	79 (64.8)
Not married	19 (48.7)	3 (7.7)	17 (43.6)	9 (23.1)	30 (76.9)	8 (20.5)	31 (79.5)
<b>Family history of breast cancer</b>							
Yes	6 (37.5)	2 (12.5)	8 (50.5)	4 (25.0)	12 (75.0)	7 (43.8)	9 (56.3)
No	76 (52.4)	8 (5.5)	61 (42.1)	46 (31.7)	99 (68.3)	44 (30.3)	101 (69.7)

<sup>†</sup>Chi square p<0.01  
 BSE: Breast self-examination  
 CBE: Clinical breast examination  
 US: Ultrasonography

est CBE application rate in the 40-59 age group and in women with more than 12 years of education. A study from Izmir found that about half of women had CBE alone or in combination with other methods (14). In another study, the majority of the study group was found to lack CBE (17). The consensus on CBE by institutes and institutions is that breast examination should be performed every 2 years after the age of 20, and annually after 40 years (4,6,9,11). It is expected that educating women about CBE may have a positive influence on the application of this method.

In our study, one in five women had breast ultrasound, and one in five women had mammography. These findings were lower than the results of studies on the frequency of breast ultrasound in our country (14,15,17,20). In terms of frequency of mammography, our results were higher than (16,19,31), similar to (32), or lower than several studies on the frequency of mammography in our country (14,15,17,18,20,29). The higher prevalence in studies on the frequency of mammography than in our study (14,15,18,29) may be related to the advanced age group and mean age of participants. The mean age of the women who participated in our study was lower than these studies. In our study, the majority of women who had a mammography stated that they were reported as 'normal', while only a few women (3.5%) stated that a biopsy was recommended. Şen and colleagues (16) determined a similar rate of women who underwent breast biopsy in their study in the city of Kütahya.

The most recent mammogram or breast ultrasound was obtained within the past year in 26.3% of women, between one to two years in 28.1%, within two-to three-years in 15.8%, and in more than three years ago in 29.8%. In studies from different countries, the rate of mammography within two years ranged from 43% to 78% (26-28,33,34). Studies in Turkey focused on whether mammography was obtained or not, rather than the timing of mammography (16,17,19,20,29,32). Very few studies investigated timing of mammography (12,14,15,18,31). In a population-based study by Ozmen and colleagues (12), the rate of mammography within the last two years was found to be 41.6%. It was stated that mammography within the last two years was more common among women with high level of education, who comply with regular gynecological follow-up and with regular BSE (12).

Dişçigil and colleagues (18) conducted a study on women living in urban and semi-urban areas of the Aegean Region, and they reported that 40.6% of women older than 40 years had a mammography, and the frequency of mammography within the last two years was 48.9% among women older than 50 years. In our study, both findings were detected at a lower rate. In our study, although the finding that 68.8% of women over the age of 40 had mammography is optimistic, it must be kept in mind that thirty percent of our participants were over forty years of age. Our study group consisted of women employed in hospital cleaning and supportive services. The study group of Dişçigil and colleagues (18) included women who participated in six consecutive health workshops or in meetings of civil society organizations. It can be expected that these group of women are more sensitive for their well-being, and therefore, had a higher rate of mammography. Another factor may be the age range of the participants. 70% of women in our study were under 40 years of age, whereas in the study by Dişçigil and colleagues (18) this rate was 38.3%. The frequency of mammography was lower in the community-sampled study by Dündar and colleagues (31) from Manisa than in our study. The rate of mammography and breast ultrasound within the last two years was higher in the 2009 community-based cross-sectional study by Özyaydın and colleagues (15) on women aged 40-69 years than in our study.

Analysis of mammography or breast ultrasound status in terms of socio-demographic characteristics revealed that women over 40 years had significantly more mammography or breast ultrasound as compared to those less than 40 years, however, no statistically significant difference was found in terms of education level and marital status. In a study by Seçginli and colleagues (32) that was conducted in women living in Istanbul, level of education and marital status did not affect mammography status. Dündar et al (31) conducted a study among women who reside in rural areas of Manisa reported that educational level, marital status or increasing age did not effect mammography. In a survey from Istanbul, it was observed that marital status had no effect on mammography, but women with higher level of education, with high income and social security had more mammography than those with lower education, lower income and without social security (20).

The majority of the women who participated in the survey (60.2%) stated that they did not perform any breast cancer early diagnosis and screening method. Reasons for this behavior were stated as unawareness in 46.2%, negligence in 31.7%, disbelief in their requirement in 12.5%, not knowing where to get these tests from in 7.7%, and the fear of detecting a mass in 1.9%. In the study by Koç et al. reasons for not having CBE and mammography were reported as lack of knowledge (73.8%), followed by shame, fear of detecting a mass, lack of time, fear of radiation exposure, high cost and fear of discomfort (19). In one study, it was detected that 55% of women did not undergo mammography at all, and the main reasons were stated as negligence (55.1%), not knowing that it was required (33.9%), not knowing where it was performed (26.3%), fear of being diagnosed with breast cancer (10.2%), being afraid of undergoing mammography (8.5%), not having social security (6.8%), and being ashamed of having mammography (5.1%) (14). The higher rate of women who were unaware of early detection methods in our study may be due to the younger age group than the previous study (14).

A training program aiming to increase awareness on breast cancer symptoms, risks, early detection and screening methods, and protection methods was implemented as part of this study. Breast models and visual materials were used during this program. In order to evaluate the effectiveness of this training program, women's average knowledge level on breast cancer was determined both prior to and after the training. Women's average level of knowledge on breast cancer was significantly increased after the training as compared to pre-training levels. Güçlü et al. carried out a study in Kütahya, on women in the 15-49 age group, and they reported that knowledge score of women was significantly increased after education on breast cancer (22). Koç and colleagues (19) observed that women's knowledge level on breast cancer, early detection and screening methods, and screening frequency was increased after training among women who admitted to the hospital in Sinop. These findings can be considered normal due to the newly obtained information after training. However, transformation of this information into practice, and creation of a permanent change in behavior are more valuable. Training is known to be an important factor on breast cancer awareness and implementation of early detection methods. The participants in this study were employed within the hospital, therefore, it is planned to follow-up their knowledge level and if these information were translated into practice in the coming years.

In conclusion, it was detected that 81.4% of women knew at least one of the breast cancer early detection and screening methods, and that this information was mainly learned from health personnel. It was determined that 70.2% of women were informed on BSE, 44.1% on

CBE, 46.0% on breast ultrasound, and 64.0% on mammography. It was observed that women's application of early detection methods was lower than their knowledge level. 49.1% of women had BSE, 32.9% had CBE, 22.4% had breast ultrasound, and 22.3% had mammography. The frequencies of application of these methods were lower than the recommended frequency. Being older than 40 years of age influenced CBE, breast ultrasound and mammography rates, whereas educational level and marital status did not have an effect. It was observed that average knowledge level of women participating in this study was significantly increased after training on breast cancer as compared to pre-training levels. Practical training on breast models is thought to particularly contribute to this increase.

It is important to educate women in order to increase awareness on breast cancer. Sensitivity of health personnel in this regard, and informing women admitted to health organizations at every opportunity, may contribute to raising awareness. Regular public education on breast cancer by public health and health care professionals, early detection and screening methods may lead women to applying early diagnosis and screening methods according to their age group. Distribution of leaflets in hospitals in a language that can be clearly understood by the community about breast cancer, and display of appropriate visual materials can contribute to raising awareness both within corporate employees and among women admitted to the hospital. Providing women with accurate information on breast cancer may also lead to spread of correct information to the community.

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