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# *Participation of First-Degree Relatives of Women with Breast Cancer in Screening Programs*

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## Abstract

***Background:*** First-degree female relatives of the patients with breast cancer have a higher risk of breast cancer than the general population does due to shared genetic factors and environmental and lifestyle similarities.
***Objectives:*** This study was conducted to determine the participation status of first-degree relatives of women with breast cancer in screening programs.
***Methods:*** This descriptive and cross-sectional study was conducted from May 2 to September 30, 2019, in the oncology unit of a university hospital in Turkey. All women who were first-degree relatives of registered patients at the specified time were considered without going through sample selection. Accordingly, 281 first-degree relatives of 135 breast cancer patients were included in the study. The data were collected by means of face-to-face interviews, the individual identification form created by the researchers in line with the literature, and the breast cancer screening program participation form. The data obtained from the study were evaluated using numbers, percentage distribution, arithmetic mean, and chi square test in the SPSS 23 statistical program.
***Results:*** In this study, it was found that only 63.3% of women knew breast self-examination, and only 37.4%of those women do it regularly. Morover 34.9% of women stated that they had clinical breast examinations before, and 24.6% had mammography before. It was found that women with secondary education or higher and benign breast disease had higher participation rates in all screening programs, and women over 40 years of age had higher rates of clinical breast examination and mammography ($p<0.05$).
***Conclusion:*** We concluded that women with first-degree relatives who have breast cancer do not adequately participate in the breast cancer screening program. We recommned information trainings be organized to raise awareness of women at risk group in terms of screening.

***Keywords: breast cancer, early diagnosis, screening, relatives***

## Introduction

Breast cancer is one of the deadliest cancer types among women worldwide and constitutes to 25% of all cancer cases and 15% of cancer deaths [1]. In Turkey, breast cancer is in the first place(41.8/100.000) among the top ten cancer types in women [2], while its incidence is 43.8 per 100 thousand according to the data in 2015 [3].
The causes of breast cancer include risk factors such as age, familial predisposition, hormonal effects, and fertility characteristics [4]. Among

these characteristics, the particular focus is on age and breast cancer history in the family [5]. First-degree female relatives of the patients with breast cancer (mother, sister, daughter/son, aunt, and granddaughter) have a higher risk of breast cancer (about two times) than the general population does due to shared genetic factors and environmental and lifestyle similarities [6]. Therefore, participation of first-degree relatives of women with breast cancer in the screening programs is critical for early diagnosis and treatment.

Early diagnosis in breast cancer is important in effetively treating the disease and determining mortality rates and prognosis [7]. In a cohort study conducted in Norway, 27 cancer-related deaths were prevented in every 10.000 women [8], while the decrease in breast cancer mortality due to screening in the USA was reported to be 10% [9]. In addition, early diagnosis and effective treatment improves quality of life, and early diagnosis offers breast-conserving treatment options [10].

Breast self-examination (BSE), clinical breast exam (CBE), and mammography are used as breast cancer early diagnosis and screening methods. According to American Cancer Association for women at average risk for breast cancer, 45 to 54 years old women should get mammograms every year, 55 and older women can switch to a mammogram every 2year or can choose to continue yearly mammographies. Screening should continue as long as a woman is in good health and is expected to live at least 10 more years. Clinical breast exams and BSE are not recommended for breast cancer screening among average-risk women at any age [11]. The Turkish Ministry of Health suggests that women over the age of 20 perform BSE every month, have their CBE done every two years over the age of 20 and once a year after the age of 40, and have a mammography every two years between the ages of 40 and 69 [12]. Women with a family history of breast cancer should start screening 10 years before the diagnosis age of the youngest individual diagnosed with breast cancer in the family but not before the age of 30, and they are recommended to have an annual mammography and CBE in 6-12 months periods in this screening program [13].

For those who have a high risk of developing breast cancer and for whom early treatment is more effective in reducing mortality, screening is extermely crucial [10]. Considering a first-degree relative with breast cancer as an important risk factor increases the value of screening programs in this group [6,10,14]. Accordingly, this study may contribute to the literature and help health professionals to determine the participation status of first-degree relatives of women with breast cancer in screening programs.

## Methods

This study used a descriptive and cross-sectional design in order to determine the participation status of first-degree relatives of women with breast cancer in the breast cancer screening programs. The population of the study consisted of first-degree relatives of women with breast cancer (mother, sister, aunt, and granddaughter) who were treated at Cumhuriyet University Health Services Application and Research Hospital in the oncology unit between May 2 and September 30, 2019. In this study, a convenient sampling method was used. There were 135 breast cancer patients receiving treatment in the oncology unit. We chose all women who were first-degree relatives of registered patients at a specified time without going through a sample selection. In this context, 281 women with no known history of breast cancer and verbal communication barriers agreed to participate in the study.

### Data collection tools

Data were collected using individual identification and breast cancer screening program participation forms.

### Individual Identification Form

This form consists of 18 statements questioning women’s personal information (age, marital status, education level, working status, economic status, presence of social security, smoking and alcohol use, chronic disease presence, etc) and their breast cancer risk status (height and weight, age of menarche, going through menopause, using hormone replacement therapy, fertility status, breastfeeding status, etc) [15-17]. Women's height and weight were measured using a weighing device and non-stretch tape measure. Women’s height was recorded in Centimeter (Cm), and their

weight in kilograms (kg). Then, Body Mass Index (BMI) was calculated using the $kg/m^2$ formula.

**Breast Cancer Screening Program Participation Form**

This form consists of 11 statements that include women's knowledge and practices to prevent and early diagnose breast cancer (BSE knowledge and performing it regularly, having CBE and mammography etc) [15,18,19]. Firstly, the form was piloted with 20 women to assess the reliablity. Then, unclear expressions in the form were detected, and the form was rearranged.

**Application**

The data were collected using face-to-face interview in a private environment. The researcher informed the women about the purpose and importance of the study and administered the data forms among the women who agreed to participate in the study. It took the participants about 20-25 minutes to fill out the study forms.

**Ethical Aspect**

Before the study, ethical board permission from the Cumhuriyet University School of Medicine Clinical Research Board of Ethics was received (date: 10.01.2018, protocol number: 2018-01/27). Additionally, institutional permission from the Sivas Cumhuriyet University Health Services Application and Research Hospital Chief Physician's Office was taken. Before data collection, the patients were informed on the type, aim, and application process of the study together with their rights regarding the study process. Next, the patients gave their written informed consent. The principles of the Helsinki Declaration were upheld throughout the study.

**Data Eavaluation**

Data were analyzed using the Statistical Package for Social Sciences version 23 (SPSS Inc., Chicago) In data evaluation, chi-square test was used to compare women's individual characteristics and their participation in breast cancer screening programs in terms of mean and percentage distribution. In statistical evaluation, the significance level was considered to be $p<0.05$.

**Results**

Socio-demographic data and information are given in Table 1 The mean age of women was 37.95 (SD=12.98) years, 55.9% of whom were between 20-39 years old, 64.8% were married, and 33.8% were primary school graduates. More demographic information is depicted in Tables 1 and 2.

*Table 1: Distribution of some socio-demographic characteristics of women (n=281)*

| Characteristics | | n | % |
|---|---|---|---|
| **Age (Mean±SD) (year)** | | 37.95±12.98 (min=20, max=78) | |
| **20-39** | | 157 | 157 |
| **40-78** | | 124 | 124 |
| **Marital status** | Married | 182 | 64.8 |
| | Single | 99 | 35.2 |
| **Educational status** | Literate | 7 | 2.5 |
| | Primary school graduate | 95 | 33.8 |
| | Secondary school graduate | 11 | 3.9 |
| | High school graduate | 76 | 27.0 |
| | University graduate | 92 | 32.7 |
| **Working status** | Working | 38 | 13.5 |
| | Not Working | 243 | 86.5 |
| **Economic status** | Less income than expense | 78 | 27.8 |
| | Equal income and expense | 185 | 65.8 |
| | More income than expense | 18 | 6.4 |
| **Social security** | Yes | 271 | 96.4 |
| | No | 10 | 3.6 |
| **Smoking** | Yes | 54 | 19.2 |
| | Duration (Mean±SD) (year) | 17.53±9.88 (min=1, max=40) | |
| | Quantity (Mean±SD) (number/day) | 21.70±9.43 (min=2, max=42) | |
| | Never before | 227 | 80.8 |
| **Alcohol consumption** | Yes | 0 | 0.0 |
| | Never before | 281 | 100.0 |
| **Degree of closeness** | Mother | 93 | 33.1 |
| | Daughter | 5 | 1.8 |
| | Sister | 39 | 13.9 |
| | Aunt | 101 | 35.9 |
| | Grandmother | 21 | 7.5 |

*Table 2*: *Distribution of some socio-demographic characteristics of women*

| Characteristics | | n | % |
|---|---|---|---|
| **Body composition according to BMI** | Normal weight | 136 | 48.8 |
| | Overweight | 96 | 34.2 |
| | Obese | 49 | 17.4 |
| **Age of menarche (Mean±SD) (year)** | 12.85±1.18 (min=10, max=16) | | |
| **Going through menopause** | Yes | 41 | 14.6 |
| | No | 240 | 85.4 |
| **Menopausal age (Mean±SD) (year)*** | 49.80±3.99 (min=42, max=60) | | |
| **Gaining weight after menopause** | Yes | 23 | 8.2 |
| | The number of kilograms gained | 6.43±4.03 (min=2, max=15) | |
| | No | 258 | 91.8 |
| **History of birth** | Yes | 180 | 64.1 |
| | Age of first birth (Mean±SD) (year) | 21.26±2.97 (min=15, max=32) | |
| | No | 101 | 35.9 |
| **Number of births*** | One | 32 | 17.8 |
| | Two | 45 | 25.0 |
| | Three | 44 | 24.4 |
| | Four | 42 | 23.0 |
| | Five or more | 17 | 9.4 |
| **Breastfeeding** | Yes | 180 | 64.1 |
| | Duration of breastfeeding (Mean±SD) (yıl) | 2.30±1.01 (min=1, max=4) | |
| | No | 101 | 35.9 |
| **Benign breast disease** | Yes | 58 | 20.6 |
| | No | 223 | 79.4 |

*n changes. Abbreviations: M, mean; SD, standard deviation; BMI, body mass indeks

Based on the results, only 63.3% of women knew BSE. In addition, only 37.4% of those who knew KKMM did it regularly, and 44.8% did once a month. Moreover, 56.3% of women did not have enough information about BSE, 36.4% did not perform it due to laziness, and 6.8% did not because of being afraid of detecting a mass. Only 34.9% of women with relatives having breast cancer had CBE. We found that 50.8% of women did not have CBE because of cosidering it as unnecessary, 26.2% because of neglecting, and 13.1% because of not having knowledge. While 24.6% of the women had a mammography before, 75.4% stated that they did not have a mammography due to reasons such as being under the age of 40, neglecting, ignoring it, and considering as unnecessary (Table 3).

*Table 3: Distribution of women's participation in breast cancer screening programs*

| Characteristics | | n | % |
|---|---|---|---|
| **Knowing breast self-examination** | Yes | 178 | 63.3 |
| | No | 103 | 36.7 |
| **Performing breast self-examination*** | Yes | 105 | 37.4 |
| | No | 176 | 62.6 |
| **Frequency of performing breast self-examination*** | Once a month | 47 | 44.8 |
| | Every two to three months | 35 | 33.3 |
| | At intervals of more than six months | 6 | 5.7 |
| | Whenever it occurs | 17 | 16.2 |
| **The reason for not performing breast self-examination*** | Not having enough information | 99 | 56.3 |
| | Neglecting, laziness | 64 | 36.4 |
| | Being afraid of detecting a mass | 12 | 6.8 |
| | Thinking that it is unnecessary | 1 | 0.6 |
| **Having clinical breast examination** | Yes | 98 | 34.9 |
| | No | 183 | 65.1 |
| **The reason for not having clinical breast examination*** | Thinking that it is unnecessary | 93 | 50.8 |
| | Neglecting, ignoring | 48 | 26.2 |
| | Not having enough information | 24 | 13.1 |
| | Being afraid of detecting a mass | 18 | 9.8 |
| **Having a mammography before** | Yes | 69 | 24.6 |
| | No | 212 | 75.4 |
| **The reason for not having mammography*** | Being under the age of 40 | 129 | 45.9 |
| | Neglecting, ignoring | 30 | 14.2 |
| | Thinking that it is unnecessary | 22 | 10.4 |
| | It's being a painful application | 11 | 5.2 |
| | Being afraid of detecting a mass | 10 | 4.7 |
| | Not having enough information | 10 | 4.7 |

*n changes

In the study, women with secondary or higher education were found to have higher rates of BSE compared to women who were literate and primary school graduates. Women who were working were found to have higher BSE performance rates than the women who were not working. Moreover, women with benign breast disease were found to have higher BSE rates than women who did not have benign breast disease ($p<0.05$) (Table 4).

*Table 4: Women's behaviors of performing BSE according to some socio-demographic and breast characteristics*

| Characteristics | | Performing Regular Breast Self-Examination | | |
|---|---|---|---|---|
| | | Yes (n=105) n (%) | No (n=176)n (%) | [a]Test |
| **Age** | 40 and below | 65 (39.6) | 99 (60.4) | X2= 0.769 |
| | 40 and above | 40 (34.5) | 77 (65.9) | p= 0.380 |
| **Marital status** | Married | 68 (37.9) | 114 (62.6) | X2= 0.004 |
| | Single | 37 (37.8) | 62 (62.6) | p= 0.948 |
| **Educational status** | Literate and primary school graduate | 31 (30.4) | 71 (69.6) | X2=3.659 |
| | Secondary school and above | 74 (41.6) | 105 (58.8) | p= 0.041 |
| **Working status** | Yes | 24 (63.2) | 14 (36.8) | X2=12.350 |
| | No | 81 (33.5) | 162 (66.9) | p= 0.001** |
| **Smoking habit** | Yes | 23 (42.6) | 31 (57.4) | X2=0.740 |
| | Never before | 82 (36.3) | 145 (64.1) | p= 0.390 |
| **Benign breast disease** | No | 69 (31.1) | 154 (68.9) | X2=18.841 |
| | Yes | 36 (62.1) | 22 (37.9) | p= 0.001** |

[a] Pearson Chi-square test *p<0.05; **p<0.01

In the study, women who were 40 years old and above were found to have higher rates of mammography than those who were under 40 years of age (p<0.05), married women compared to singles (p<0.05), literate and primary school graduates compared to women with secondary education or above (p<0.05), and women with benign breast disease compared to those without benign breast disease had higher rates of mammography (p<0.05) (Table 5).

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***Table 5. Women's having mammography according to some socio-demographic and breast characteristics***

| Characteristics | | Having Mammography | | |
|---|---|---|---|---|
| | | Yes (n=69)n (%) | No (n=212)n (%) | [a]Test |
| **Age** | 40 and below | 8 (4.8) | 157 (92.5) | X2= 83.789 |
| | 40 and above | 61 (52.6) | 55 (47.4) | p= 0.001* |
| **Marital status** | Married | 60 (33.0) | 122 (67.0) | X2= 19.731 |
| | Single | 9 (9.1) | 90 (90.9) | p= 0.001* |
| **Educational status** | Literate and primary school graduate | 42 (41.2) | 60 (58.8) | X2=23.879 |
| | Secondary school and above | 27 (15.1) | 152 (84.9) | p= 0.001* |
| **Working status** | Yes | 12 (31.6) | 26 (68.4) | X2=1.170 |
| | No | 57 (23.5) | 186 (76.5) | p= 0.279 |
| **Smoking habit** | Yes | 15 (27.8) | 39 (72.2) | X2=0.375 |
| | Never before | 54 (23.8) | 173 (76.2) | p= 0.540 |
| **Benign breast disease** | No | 33 (14.8) | 190 (85.2) | X2=55.519 |
| | Yes | 36 (62.1) | 22 (37.9) | p= 0.001* |

[a]Pearson Chi-square test * p<0.01

In the study, women of 40 years old and above were found to have higher rates of CBE than those under 40. Additionally, married women compared to singles, literate and primary school graduate women compared to secondary or higher education graduates, and women with benign breast disease compared to those without benign breast disease had higher levels of CBE (p<0.05) (Table 6).

***Table 6: Women's having clinical breast examination according to some socio-demographic and breast characteristics***

| Characteristics | | Having Clinical Breast Examination | | |
|---|---|---|---|---|
| | | Yes (n=98)n (%) | No (n=183)n (%) | [a]Test |
| **Age** | 40 and below | 33 (20.0) | 132 (80.0) | X2= 38.941 |
| | 40 and above | 65 (56.0) | 51 (44.0) | p= 0.001** |
| **Marital status** | Married | 89 (48.9) | 93 (51.1) | X2= 44.743 |
| | Single | 9 (9.1) | 90 (90.9) | p= 0.001** |
| **Educational status** | Literate and primary school graduate | 56 (44.9) | 46 (45.1) | X2=28.275 |
| | Secondary school and above | 42 (23.5) | 137 (76.5) | p= 0.001** |
| **Working status** | Yes | 14 (36.8) | 24 (63.2) | X2=0.075 |
| | No | 84 (34.6) | 159 (65.9) | p= 0.784 |
| **Smoking habit** | Yes | 27 (46.3) | 29 (53.7) | X2=3.949 |
| | Never before | 73 (32.2) | 154 (67.8) | p= 0.047* |
| **Benign breast disease** | Benign breast disease | 48 (21.5) | 175 (78.5) | X2=84.788 |
| | Benign breast disease | 50 (86.2) | 8 (13.8) | p= 0.001** |

[a]Pearson Chi-square test *p<0.05; **p<0.01

**Discussion**

The low participation rates of first-degree relatives of women with breast cancer in screening may result in the diagnosis of breast cancer in an advanced stage. For this reason, it is highly recommended that first degree-relatives of patients with breast cancer perform BSE and have CBE and mammography [14]. Although its effects on reducing cancer mortality is discussed, BSE enables women to detect approximately 80% of the masses [20]. Therefore, it is important for women to perform BSE regularly so that they can recognize their own breasts, detect possible

changes early, and refer to the health institution on time [14,20]. Our findings showed that 63.3% of women knew BSE, and about half of those who knew (44.8%) performed it once a month. Based on the literature, first-degree relatives of women with breast cancer had low rates of performing BSE [18,19,21-25]. A study conducted in Malaysia found that although the participants' awareness of screening was good, their rate of performing BSE was lower [25]. Analyzing studies conducted in the general population in Turkey, Turk et al. (2017) stated that 25.6% of women applied BSE [26], while Guzel and Bayraktar (2019) found that 36.1% of women who performed BSE did it once a month [16] Another study reported that although BSE perform rate was 78%, only 15.2% did it once a month [27]. Although the rate of performing BSE in this study was higher than the one reported in other studies, it was not at a desired level.

Although BSE is an easy and cost-free practice, it is not performed by women at the desired level [14,15,28]. In this study, the lack of information, neglect, and laziness were among the first reasons for not performing BSE among women. This shows that the lack of knowledge/awareness is the most important reason for not performing BSE.

Clinical breast examination can contribute to the early diagnosis of breast cancer in women younger than 40 years old, who did not have a mammography screening [16, 26]. While 35.5% of Mexican women who had a family history of breast cancer had CBE [18], this rate was 93% in African women living in the USA [21]. In studies conducted on women in general population of Turkey, it was found that most of them did not have CBE, [15,16,26] and enough information about the frequency and onset of breast cancer [16]. Besides, they did not have CBE because of not feeling the need, neglecting, and being ashamed or afraid [29]. In this study, only 34.9% of women stated that they had CBE, and 50.8% did not have CBE due to considering it as unnecessary. İn addition, CBE history was not found in women due to neglecting, ignoring (26.2%), and not having knowledge (13.1%). Previous studies show that women's knowledge and awareness of CBE is insufficient, and the rate of CBE is low.

Mammography is one of the most important screening methods that reduce mortality in breast cancer. It is believed that mortality decreases up to 30% as a result of early diagnosis in screenings made with mammography [30]. In this study, only 24.6% of women had a mammography before. In line with our findings, earlier studies found that the individuals who have a family history of breast cancer had a low mammography rate [18,19,25,31,32]. Bird et al. (2011) found the rate of women having mammography in the last year to be 38.7% [18], and Hunter et al. (2003) found it to be 3% [31]. Subramanian et al. (2013) concluded that 68.1% of Malaysian women over 40 did not have mammography [25]. In the same vein, West et al. (2003) found the rate of women having mammography in the last 5 years as to be 33% [19], while Haber et al. (2012) found it in the last 6 years to be 48% [32]. On the contrary, Lemon et al. (2006) found the rate of having mammography of women aged 40-49 and 50 and above as 75% and 71%, respectively [5]. Halbert et al. (2006) found the rate of women having mammography in the last year as 75% [21]. According to Turkey Statistics Corporation data, the rate of women's having mammography in general population of Turkey is 19.6% [33]. These data show that participation in screening programs is low, and developing screening programs based on country facts is an important factor.

Factors such as neglect [16,28], lack of information [25,28], ignoring, shame [15], worry of getting bad results, lack of time, fear of receiving radiation, high costs, and fear of pain [25] affect the participation in mammography screening. İn this respect, in our study, 14.2% stated that they did not have a mammography because of neglecting and ignoring, and 10.4% thought that it was unnecessary. This finding is compatible with the literature.

Socio-demographic characteristics (age, education, working status, marital status, etc) can affect women's participation in breast cancer screening programs [16-18, 24,25]. In this study, women with secondary education or higher, working women, and women with benign breast disease were found to perform higher rates of BSE on a regular basis ($p<0.05$). In addition, it was determined that those who were 40 years old and above, were married, had education levels of Literate and primary school, and suffered from benign breast disease had higher rates of CBE and mammography. In a study in which first-degree relatives of breast cancer patients were included, women with advanced age and higher educational levela performed BSE more regularly [23]. And,

in another study, the rate of performing BSE among young women was higher, and there was a positive relationship between having a mammography and social security [16]. In studies carried out in Turkey, participation in mammography screening was related to being over the age of 40 [17], high educational levels [16], being married [28], and having social security [17]. Contrary to these findings in the study of Erkal, it was found that socio-demographic characteristics of women did not affect the status of having CBE and performing regular BSE [28]. High rates of performing BSE, CBE, and mammography in women with benign breast disease may be due to referring to health institutions for breast complaints and being informed about screening programs in this process.

## Conclusions

In conclusion, we believe that the awareness and practices regarding early diagnosis of breast cancer in women with first degree-relative having breast cancer are not at a desired level. Education, age, and benign breast disease affect this situation. We recommend responsible parties to organize information trainings with the aim of raising the awareness of women in the risk group about screening, plan screening programs considering the socio-economic and cultural structure of the society, monitor women with a family history of breast cancer through KETEM (Cancer Early Diagnosis, Screening, and Education Centers), and make periodic screenings.

## Conflicts of interest

The authors declare that there are no conflicts of interest.

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