Original Article

Eur J Breast Health 2018; 14: 23-28
DOI: 10.5152/ejbh.2017.3272

Breast Cancer Screening Behaviors of First Degree Relatives of Women Receiving Breast Cancer Treatment and the Affecting Factors

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ABSTRACT

Objective: First-degree relatives of women with breast cancer are under higher risk when compared with the general population. The aim of this study is to evaluate breast cancer screening behaviors of women who are first-degree relatives of women with breast cancer and factors affecting these behaviors.

Materials and Methods: This descriptive study included 240 patient relatives, who agreed to participate in the study through contact with first-degree relatives of 133 patients who were receiving breast cancer treatment at the Oncology and Chemotherapy unit of an university hospital in Turkey. Data were collected using the "Descriptive Characteristics Form," which consisted of socio-demographic characteristics, health history, breast cancer risk level and health beliefs as well as the "Breast Cancer Screening Behavior Evaluation Form".

Results: Out of the subjects, 17% reported doing breast self examination (BSE), 18% reported getting clinic breast examination (CBE) and 17% reported getting mammography.

Logistic regression analysis showed that perceived susceptibility increased BSE by 0.57 times and increased mammography by 0.77 times. Physical exercise increased CBE by 0.21 times and increased mammography by 0.13 times.

Conclusions: It was found that women with familial breast cancer history (FBCH) had lower participation in screening behaviors. Higher susceptibility perception and regular physical exercise are the determinant variables. Women with a higher susceptibility can be led towards the screening and their participation can be increased. In women with family history, the development of healthy lifestyle behaviors like physical exercise should be supported.

Keywords: Breast cancer screenings, family history, health beliefs, susceptibility

Cite this article as: Kırca N, Tuzcu A, Gözüm S. Breast Cancer Screening Behaviors of First Degree Relatives of Women Receiving Breast Cancer Treatment and the Affecting Factors. Eur J Breast Health 2018; 14: 23-28.

Introduction

Breast cancer is the most common cancer among females in Turkey. Incidence rate in the year 2008 was 40.7 in 100,000 and this rate increased to 43 in 2014 (1). Breast cancer incidence in Turkey is similar to the other developing countries but mortality is higher when compared with these countries (2). The best way to fight cancer is to prevent its development by controlling the known risk factors. The most important risk factors for breast cancer are female gender, advancing age and family history. First-degree relatives (mother, sister and daughters) of women with breast cancer are at higher risk when compared with the general population and it has been reported that family history has a role in 5-10% of cases (3). Studies from Turkey have reported the genetic risk ranging from 5.4% to 25.9% (4-7). One study found that in all age groups, the breast cancer rate was higher in sisters of women with breast cancer when compared to women without familial breast cancer (8). Early diagnosis and treatment are crucial in preventing and reducing cancer-related deaths in high risk groups (9-10). Family history is an unchangeable risk factor and when it is present, early diagnosis can be possible by opportunistic screening programs and medical counseling (11). American Cancer Society (ACS) recommends annual magnetic resonance imaging for high risk women in addition to national screening programs (12). According to the protocol of breast cancer screening program in Turkey, it is required for women aged between 20 and 40 years to perform breast self examination (BSE) and routine clinic breast examination (CBE)

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Received: 02.02.2017
Accepted: 14.06.2017

should also be done by a physician yearly for women that have FBCH in their first-degree relatives and once every 2 years for women that do not have family history. All women aged between 40-69 years should have routine CBE yearly and mammography done every 2 years by a physician (13).

Breast cancer screening rates are very low in Turkey. According to the Ministry of Health, the monthly BSE rate was 22.9% and the routine rate for mammography every 2 years was 13.6%. Every year, many women die because of breast cancer, which illustrates the importance of screening in reduction of breast cancer-related deaths (1). Schwab et al. (14) reported that better results were achieved regarding tumor size, disease phase and histological examination through screening programs in women with breast cancer. In a study conducted in Turkey (15), groups having higher risk for breast cancer had mammography rates 11 times higher than the others and in another study, it was determined that the CBE rate was 48.1% in women with a family history (16).

The fact that women do not participate in breast cancer screening programs which are free of charge and for the individual's benefit can be explained by behavioral change models. In studies evaluating participation in cancer screening, the Health Belief Model (HBM) is the most commonly used. This model draws attention to individual perception, which affects individual's health behavior. Components of the model are as follows: perceived susceptibility, perceived seriousness, benefits, perceived barriers, self-efficacy and health motivation. Perceived susceptibility includes a person's belief about getting a disease. According to HBM, an increase in perceived susceptibility will result in an increase of attitude and behavior towards early diagnosis in breast cancer. Perceived seriousness is one's opinion of how serious a condition and its consequences are. Health motivation is one's motivation to realize that a behavior sustains and develops health. In some studies, it has been reported that early screening behavior for breast cancer changes positively with increased perceived susceptibility, perceived seriousness, and health motivation (17-19).

Evaluation of screening participation among women with FBCH may help in the planning of future interventional studies. The aim of this study was to evaluate breast cancer screening behaviors of women who were relatives of women with breast cancer and also factors affecting these behaviors.

Materials and Methods

Design and samples

This descriptive study included relatives of 133 patients receiving breast cancer treatment at the Oncology and Chemotherapy unit of the biggest university hospital in the southwestern Turkey between March and May, 2014 and those who agreed to participate were included. Phone numbers of these patients' biological mothers, daughters older than the age of 20 or sisters were recorded. Two hundred forty relatives were invited via phone and all of them agreed to participate in the study. All the data were collected via face-to-face interview from the participants at a designated address. The study sample power was calculated after the data were collected. When the mammography percentage (91%) given in the previous study for sample power was taken as the primary variable (20), the power was calculated as 100% with a sided, $\alpha = 0.05$ and 95% confidence interval (21).

Data collection tools

The data were collected using the "Descriptive Characteristics Form," which consisted of sociodemographic characteristics, health history and health beliefs as well as the "Breast Cancer Screening Behavior Evaluation Form".

The descriptive characteristics form had four parts: Socio-demographic characteristics, health history, breast cancer risk level and health beliefs of the participants. Questions about the socio-demographic characteristics and health history were prepared by the researchers by reviewing the literature (3, 11, 20-22).

Sociodemographic characteristics: In this part, education, marital status, having a child, residence, working status and perceived income, family structure and health insurance were evaluated using closed-ended questions while age was evaluated via open-ended questions.

Women's health history: In this part, at least 6 months of breast feeding, receiving hormone replacement therapy for more than 5 years, use of oral contraceptives for 5 years, physical exercise for at least 30 minutes for 3 times a week, chronic diseases, alcohol consumption more than 2 units or more a day, breast cancer history and cognizant of breast cancer signs (nipple retraction, nipple discharge, redness, pitting that resembled the skin of an orange) were evaluated using yes/no choices.

Breast cancer screening behavior evaluation form: breast cancer screening behaviors were evaluated by a structured questionnaire prepared by the researchers based on a literature review (14, 20). This form consisted of questions regarding regular BSE in the last 6 months, getting CBE in the last year and undergoing mammography in the last year as evaluated using yes/no answers. Breast cancer health beliefs: The Turkish version of the Breast Cancer and Screening HBM was used to evaluate health beliefs about breast cancer (23). This model was developed by Champion in 1984 (24) and adapted to Turkish by Gözüm and Aydın in 2004 (23). This scale has 3 items for the "susceptibility" subscale, 6 items for "severity" and 5 items for "health motivation." A 5-point Likert-type scale was used where 1 meant 'strongly disagree' and 5 'strongly agree'. For every dimension, higher scores indicated more positive health beliefs for that dimension. Internal consistency of the Turkish version of the scale was found to be 0.69, 0.75 and 0.83, respectively (23).

Ethical approach

Official permission was obtained from Akdeniz University; IRB approval was obtained from the Medical Faculty with the board decision dated 01.04.2014 and number 70904504/138. Written and signed informed consent was taken from participants with FBCH.

Statistical analyses

Statistical analyses of the data were conducted using the Statistical Package for the Social Sciences SPSS for Windows, version 20.0 (SPSS Inc.; Chicago, IL, USA). The effects of independent variables (socio-demographic characteristics, health history, breast cancer risk level, health beliefs) on the dependent variables (breast cancer screening behavior) were analyzed using basic statistical tests (Pearson's Chi-square test, Fisher's exact test and t-test) depending on whether data was categorical or continuous. These basic analyses were conducted separately for BSE, CBE and mammography. After basic analyses, for every statistically significant variable, each screening method was evaluated using a logistic regression model. In logistic regression, $p>0.05$ in Hosmer-Lemeshow test was the criteria. The statistical power of each test was calculated by using G*Power program and it was more than 90%. The level of statistical significance was set at $p<0.05$, and a confidence interval of 95% was determined.

Results

Socio-demographic characteristics of the participants

The mean age of the 240 participants was 43.1+12.9 years ranging from 21 to 72 years, with 52.5% of women being older than 40 years. Most participants were married (89.6%), had completed high school and higher (50.0%), and/or were employed (57.5%). Seventy one point seven percent of the participants were residing in the Antalya city center, 76.3% had less income than their expenses and all had social security (Table 1).

Participants' screening behaviors and related factors

Seventeen percent of participants were performing BSE, 18% were receiving CBE and 17% had mammography, %48 haven't had screening (Table 2).

When socio-demographic factors related to BSE were evaluated with basic statistical analysis (Chi-square), the BSE rate was found to be higher in participants with higher education and with an income equal to or higher than the expenses ($p<0.05$); the other factors (age, marital status, residence and working status) were not significant ($p>0.05$).

When the health history factors that can affect the BSE were analyzed using basis statistical tests (Chi-square and t-test); the BSE rate was higher in participants who had a child, were regularly exercising and cognizant of breast cancer signs (nipple retraction, discharge, redness, pitting that resembles the skin of an orange) ($p<0.05$). Health beliefs and breast cancer risk points had no effects on BSE behavior ($p>0.05$). However, the time of diagnosis of the first-degree relative, perceived susceptibility and health motivation were significantly effective factors ($p<0.05$). When these significant factors were further analyzed using logistic regression, only increased perceived susceptibility was found to be correlated with increased BSE (OR: 0.57, $p<0.05$) (Table 3).

When factors that can affect getting a CBE were analyzed using basis statistical tests, CBE rate was found to be higher in participants with higher education, income equal to or higher than expenses, used oral contraceptive for less than 5 years, did regular physical exercise, were cognizant of breast cancer signs (nipple retraction, discharge, redness,

Table 1. Sociodemographic characteristics (n=240)

Variables	n	%
Age		
40<	114	47.5
40≥	126	52.5
Mean (SD)	43.1±12.9	
Marital status		
Married	215	89.6
Single	25	10.4
Education status		
Illiterate	34	14.2
Primary school and Secondary school (1-8)	86	35.8
High school and higher (9+y)	120	50.0
Employment status		
Yes	138	57.5
No	102	42.5
Place of residence		
Antalya city center	172	71.7
Other	68	28.3
Economic status		
Income<expenditure	183	76.3
Income=expenditure	54	22.5
Income>expenditure	3	1.2
Social security		
Yes	240	100.0

Table 2. Screening attendance status (n=240)

	Attending	
Screening	**n**	**%**
BSE	41	17
CBE	42	18
Mammography	40	17
Non-screening	117	48

BSE: breast self examination; CBE: clinic breast examination

Table 3. Logistic regression: prediction of the likelihood of BSE (n=41)

Variables	Odds Ratio	95% CI	p
Education	4.46	0.05-39.29	0.511
≤5y (1)			
>5y			
Economic status	0.20	0.01-2.76	0.227
Income <expenditure (1)			
Income≥expenditure			
Having a child	1.64	0.08-35.34	0 .753
Using oral contraceptive for more than 5 years	0.06	0.00-8.78	0.264
Doing regular physical exercise	1.16	0.02-73.21	0.945
Nipple retraction	0.10	0.00-57.78	0 .683
Nipple discharge	0.02	0.00-1.85	0.088
Redness of the breast skin	43.40	0.01-62.94	0.318
Pitting resembling the skin of an orange	0.15	0.00-56.51	0 .650
The time of diagnosis of the first-degree relative	2.14	0.17-27.50	0 .561
Susceptibility	0.57	0.33-0.99	0.048*
Health motivation	1.06	0.66-1.71	0.810

BSE: breast self examination
NOTE: Hosmer- Lemeshow test: p=0.743
*Significant p<0.05

pitting resembling the skin of an orange) and had higher health motivation (p<0.05). In logistic regression analysis, only regular physical exercise was correlated with higher CBE rates (OR: 0.21, p<0.05) (Table 4).

When health history factors were analyzed using basis statistical tests (Chi-square and t-test), education level equal to high school or higher, regular physical exercise, being cognizant of breast cancer signs (nipple retraction, discharge, redness, pitting resembling the skin of an orange) and having higher perceived susceptibility were related to higher mammography rates (p<0.05). Only two variables were found to be significant in the logistic regression: regular physical exercise (OR: 0.13, p<0.05) and perceived susceptibility (OR: 0.77, p<0.05) (Table 5).

Table 4. Logistic regression: prediction of the likelihood of CBE (n=42)

Variables	Odds Ratio	95% CI	p
Education	1.04	0.42-2.60	0.92
≤5y (1)			
>5y			
Economic status	0.57	0.25-1.31	0.18
Income<expenditure (1)			
Income≥expenditure			
Using oral contraceptive more than	0.49	0.22-1.11	0.09
5 years			
Doing regular physical exercise	0.21	0.07-0.63	0.01*
Nipple retraction	1.25	0.37-4.24	0.72
Nipple discharge	0.39	0.12-1.20	0.10
Redness of the breast skin	0.69	0.14-3.31	0.64
Pitting resembling the skin of an orange	0.54	0.14-2.17	0.39
Health motivation	0.90	0.76-1.07	0.23

CBE: clinic breast examination
NOTE: Hosmer- Lemeshow test : p=0.47
*Significant p<0.05

Table 5. Logistic regression: prediction of the likelihood of mammography (n=40)

Variables	Odds Ratio	95% CI	p
Education	1.09	0.43-2.75	0.85
≤5y (1)			
>5y			
Doing regular physical exercise	0.13	0.04-0.43	0.01*
Nipple retraction	1.24	0.36-4.28	0.73
Nipple discharge	0.34	0.11-1.07	0.07
Redness of the breast skin	0.62	0.13-3.12	0.57
Pitting resembling the skin of an orange	1.25	0.26-6.10	0.78
Susceptibility	0.77	0.66-0.90	0.00*
Health motivation	0.92	0.78-1.09	0.34

NOTE: Hosmer-Lemeshow test: p=0.25.
*Significant p<0.05.

Discussion and Conclusion

In this study, the BSE rate was almost two times higher than the Turkish Ministry of Health[1] data but only approximately 1 in 5 of them was performing BSE. Mammography rates were low, which was similar to the Turkish population. In other studies from Turkey, regular mammography and BSE rates were higher in women with family history when compared with women without family history (16, 25). In studies from different parts of the world, screening behavior of women with BCHF in the last year ranged from 56.8% to 91% (20, 22, 26-27). In our study, the BSE rate was higher than CBE and mammography rates; however, participation rates for all three methods were very low. Low participation for CBE and mammography screening reveals that these women's breast cancer screening awareness was limited to BSE. Fair et al. (28) reported that high breast cancer risk was not enough to provide courage to face breast cancer and it might cause fear, thus preventing women from getting mammography. Another explanation for low participation in screening programs could be that screening programs in Turkey are new (since 2015) and there are no special screening programs for women with family history. Another explanation for the low rate of participation in screenings in this study is that screening program specific to those having family history in Turkey started only recently (in 2015).

In this study, basic statistics revealed that higher education and income, having a child, regular physical exercise, being cognizant of breast cancer signs (nipple retraction, nipple discharge, redness, pitting resembling the skin of an orange) and perceived health motivation positively affected BSE behavior. However, a logistic regression model with these variables showed that only perceived susceptibility was slightly correlated with BSE. Similarly, women who felt that their family history of breast cancer was a risk had increased susceptibility towards cancer and they cared about the cancer screening behavior (29). In the study by Fouladi et al. (30), perceived susceptibility was higher in women with family history when compared with others. This was explained by higher apprehension among the women with BCFH. However, other studies have shown that perceived susceptibility does not have any effects on BSE behavior (16, 31).

In this study, regular exercise was an effective factor in getting CBE and mammography. This was a significant finding. Moderate physical activity among Turkish women is very low: only 20.2% (32). This can indicate that regular physical exercise is a sign of an individual's sensitivity towards developing and protecting health behavior. An individual diagnosed with cancer in a family can increase susceptibility of the other family members who have similar genetic and environmental characteristics. This may lead other family members to participate in healthy lifestyle behaviors like exercise (33). However, in two different studies (20, 34), healthy lifestyle behaviors like physical exercise were not effective when it came to screening behaviors.

In this study, perceived susceptibility was another factor which increased mammography participation. Because perceived susceptibility is also effective in BSE behavior, this group seems ready to participate

in screening. Ersin et al. (35) and Aker et al. (36) have reported that perceived susceptibility is an important factor for getting mammography. However, Baysal and Gözüm (37) have found in their study women with lower perceived susceptibility had no intentions to undergo mammography. Since the perceived susceptibility is an important factor in having mammography in this study, the importance of considering the perceived susceptibility in the interventions to be made to encourage women to have mammography has been suggested.

Women with BCFH participate in breast cancer screening even less often than the general population in Turkey. Perceived susceptibility and regular physical exercise are determining variables for breast cancer screening behavior. Healthy lifestyle changes like physical exercise should be supported in women with family history. Because perceived susceptibility is an important determinant of participation in screening, health professionals should be supportive in directing women with family history towards screening. Also, it is important to prioritize the screening and direct them to screening.

The limitations of the study

While evaluating the results of this study, it should be taken into consideration that probability sampling method was not used in selection of the participants and the study was conducted with patient relatives coming to only one hospital. The sample size could be considered as small; however, the statistical power of the study was found to be enough to interpret the data obtained in the study.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Akdeniz University (Decision Date: 01.04.2014, Decision Number: 70904504/138).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - N.K., S.G., A.T.; Design - S.G., N.K., A.T.; Supervision - S.G., A.T.; Resources - A.T., NK.; Materials - S.G, A.T., N.K.; Data Collection and/or Processing - N.K., A.T.; Analysis and/or Interpretation - S.G., A.T., N.K.; Literature Search - A.T., N.K.; Writing Manuscript - A.T., S.G., N.K.; Critical Review - N.K., A.T., S.G.; Other - N.K., A.T., S.G.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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