

RESEARCH ARTICLE

Identifying Women's Knowledge about Risk Factors of Breast Cancer and Reasons for Having Mammography

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Abstract

The aim of this study was to identify breast cancer risk factors and reasons for having mammography of the women who applied for mammography, as well as to determine their level of knowledge about risk factors and level of risk perception, and anxiety concerning breast cancer. This cross-sectional descriptive study was conducted from June 15, 2010 through September 10, 2010, in a university hospital in Ankara, Turkey. A questionnaire prepared by the researchers was used to collect the data. The mean age of the women was 52.1±9.98 years. Sixteen percent of the women had a family history of breast cancer. The majority of participants had mammograms (75.8%) before and had gained knowledge about breast cancer and its screening (73.7%). The leading source of information about breast cancer was physicians (46.2%). Physician recommendations, having breast-related complaints, and family history of breast cancer were important reasons to obtain mammography. The mean knowledge score about risk factors of breast cancer was 4.15±2.73 and the mean anxiety score was 1.65±1.61. It was found that some socio-demographic and obstetrical characteristics of women, their family history, and risk perceptions about breast cancer affect their knowledge and anxiety scores about breast cancer. In conclusion, the present study identified a number of factors affecting mammography participation for women. The results of this study can be helpful in promoting screening for breast cancer.

Keywords: Breast cancer - risk factors - breast cancer knowledge - mammography - risk perception - Turkey

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Introduction

Breast cancer is the most common cause of cancer mortality, accounting for 16% of cancer deaths in women. It is estimated that 7.4 million people died of cancer in 2004 and, if current trends continue, 83.2 million people will have died by 2015 (World Health Organization, 2008). According to report from the Ministry of Health of Turkey, breast cancer is the most common type of cancer and the second leading cause of cancer death for women, with an incidence of 35.5 cases per 100,000 (Secginli and Nahcivan, 2011).

Many risk factors have been known for breast cancer. Gender and age are major risk factors for breast cancer. Most of breast cancers occur in women over the age of 50 years and the risk steadily increases with age. Family history of breast cancer, a previous breast biopsy and three of the most common implicated genes are BRCA1, BRCA2 and P53 have been reported as strong risk determinant (Lemone et al., 2011). Extensive mammographic breast density is associated with increased risk of breast cancer (Schreer, 2009; Brower, 2010). The other risk factors regarding breast cancer are age at menarche, age at natural menopause, the interval between age at menarche and age at natural menopause, having a full-term pregnancy, number of live births/ full-term

pregnancies/deliveries, breastfeeding history, alcohol consumption, previous exposure to radiation, smoking, the use of oral contraceptives and postmenopausal hormones, obesity in postmenopausal women and dietary factors like a high fat (Lee and Park, 2008; Lemone et al., 2011). Revealing the risk factors about breast cancer, identifying the risk groups and making the screening programs widespread are significant in reducing the risks for breast cancer (Eti and Gürkan, 2007). Early detection and effective treatment are important to reduce morbidity and mortality of breast cancer. Mammography, clinical breast examination (CBE), and breast self-examination (BSE) are recommended methods for early detection of breast cancer (Khatcheressian et al., 2006). Studies have showed that BSE and CBE are not efficient enough for early diagnosis because of their lack of reliability and they have a limited effect alone on the breast cancers mortality (Kearney and Murray, 2009). On the other hand, it is argued that screening through mammography decreases the rate of mortality caused by breast cancer by from 15 % to 30 % (Götzsche and Nielsen, 2009; Nelson et al., 2009).

Many countries have introduced population-based programs that aim to regularly screen at least 70% of target-aged women. In Turkey, Cancer Early Diagnosis and Screening Centers offer health education, counseling, invitation for screening, and free breast cancer screening

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activities. Research on different regions of Turkey in terms of the rates of women having the experience of breast screening concludes that the rate of these women varies from 10% to 38% (Nur, 2010; Yavan et al., 2010; Akpınar et al., 2011; Yilmaz et al., 2011). Therefore, it is concluded that Turkish women's behaviors toward early diagnosis of breast cancer is insufficient.

Several factors have been linked with mammography use. Socio-economic characteristics, breast cancer knowledge, health beliefs, attitudes to breast cancer, breast cancer risk perception, access to health care services, health insurance coverage, family history of breast cancer, and physician recommendation have been reported with mammography screening (Sofair and Lehlbach, 2008; Han et al., 2009; Kim and Menon, 2009; Yavan et al., 2010; Secginli and Nahcivan, 2011). Anxiety has an uncertain role in mammography compliance in general (Sofair and Lehlbach, 2008). Understanding women's characteristics participating mammography screening and the factors influencing women's decisions to obtain mammography is essential for increasing participation in breast cancer screening. Thus, the aim of the study was to identify the risk factors of the women who applied for mammography in regard to breast cancer and the reasons for their application for mammography as well as to determine their level of information about risk factors and their level of risk perceptions and anxiety concerning breast cancer.

Materials and Methods

Study design

This cross-sectional descriptive study was conducted from June 15, 2010, through September 10, 2010, in a university hospital in Ankara, Turkey. Prior to data collection, the study was approved by institutional Ethic Committee of the hospital. Eligibility criteria for participants were: a) willing to participate to study, b) able to read and write in Turkish.

Measures and Data Collection

A data collection form and "Breast Cancer Risk Factors Knowledge Form" prepared by the researchers were used to collect the data. Data collection form was included 26 questions related to socio-demographic and descriptive characteristics (age, educational level, marital status, having a child, history of breast cancer in the family, BSE performance, breast-feeding, menopause etc.), 1 question related to perceived anxiety level about breast cancer, and 1 question related to perceived breast cancer risk. Perceived anxiety level was investigated based on Meystre-Agustoni et al. (2001) study, using a single direct question on the global perception of anxiety related to breast cancer (breast cancer anxiety indicator (BCA)). The question was "To summarize, how do you rate your anxiety in relation to breast cancer during the last week?" Answers were given on a quantitative scale from 0 (not at all anxious) to 5 (very anxious) (See appendix 1). Perceived breast cancer risk was investigated on a 4-point Likert scale (no risk, usual, moderate, and strong risk). Risk classification scheme was based on similar studies (Pöhls et al., 2004; Tastan et al., 2011). Breast Cancer Risk

Factors Knowledge Form was included 10 questions to measure level of knowledge of the women about breast cancer risk factors. Breast cancer risk factors knowledge questions were based on common knowledge of breast cancer risk factors and composed specifically for this study based on an extensive review of the literature. All the items were true-false or I do not know response. To obtain total knowledge score, one point is added for each correct answer and with scores ranging from 0 to 10. The knowledge questions were pilot tested for comprehension with a sample of 10 women that was not included in the study sample.

The data were collected by two researchers from women waiting for mammography screening in the radiology department. Women who did not want to answer the questions were excluded from the study. All data collection forms were filled out by patients. Verbal informed consent was obtained during data collection. The time for participants to complete the questionnaire was approximately 10-15 minutes. At the end of study period, a total of 528 women were included in the study.

Statistical Analysis

The SPSS 15.0 (SPSS Inc., Chicago, IL, USA, 2006) software was used for analyzing the data. Mean (SD) for continuous data, frequencies and percentages for nominal data were used for descriptive statistics. The relationship between independent variables and mean breast cancer knowledge and mean anxiety scores was evaluated by using Independent Samples t-Test and one-way ANOVA. A level of $p < 0.05$ was considered as statistically significant.

Results

Characteristics

Table 1 shows the distribution of some demographic characteristics of women. The mean age of the women was 52.05 ± 9.98 years (range=30-87). Most women were married (91.5%), not working (83.1%), and had secondary school education (39%). Almost all of the women had children (94.9%) and majority of them breastfeed (69.5%) their children. Only 3.8% of the women reported taking hormones for birth control and 10.5% reported taking hormone replacement therapy. Nearly half of participants (50.8%) were menopausal, with an average age of menopause onset being 45.39 ± 8.81 years. 30.7% of women stated that they regularly check their breasts with BSE (Table 1).

Women's perceived breast cancer risk, history of breast cancer, and reasons for having mammogram

In this study, 28.5% (N=150) of women are found to have medium or higher levels of risk perceptions about breast cancer. While 7.0% of women in the study had been diagnosed with breast cancer in the past, 16.5% had a family history of breast cancer. On the other hand, 29.9% (N=158) of the participants reported that there is benign cyst or mass in their breast. The rate of the participants who reported that they previously had a breast biopsy is found to be 26.3% (N=139). The majority of

Table 1. Some Characteristics and Breast Cancer Risk Factors of Women

Characteristics	n	%	M±SD
Age (yr)			52.05± 9.98
<50	257	48.7	
≥50	271	51.3	
Marital status			
Married	483	91.5	
Unmarried	45	8.5	
Educational level			
Elementary school	36	6.8	
Secondary school	206	39.0	
High school	172	32.6	
University	114	21.6	
Having a child			2.30±1.03
Yes	501	94.9	
No	27	5.1	
Body mass index (k/m2)			27.59±4.71
<25	174	33.2	
>25	350	66.8	
Age at menarche			13.49±1.85
9-11	28	5.3	
12-13	253	47.9	
>14	247	46.8	
Age at first birth (yr)			21.89±4.51
<30	467	93.4	
>30	33	6.6	
Breast-feeding			12.69±8.81
Yes	346	69.5	
No	152	30.5	
Taking hormone therapy			
No	445	85.1	
Hormones for birth control	20	3.8	
Hormone replacement therapy	55	10.5	
Both	8	1.5	
Menopausal status			45.39±8.81
Yes	268	50.8	
No	260	49.2	
Performed of BSE regularly			
Yes	165	31.3	
No	363	68.8	

women had mammogram (75.8%) before and had gained information about breast cancer and its screening (73.7%). Leading source of information about breast cancer was physicians (46.2%). The most common reasons for current mammogram screening were physician recommendation after clinical breast examination (50.5%; N=266) and regular breast cancer screening (42.3%; N=223) (Table 2).

The knowledge of breast cancer risk factors of women Table 3 shows the participants' mean scores of their information about risk factors concerning breast cancer based on some demographical characteristics. It is found that mean score for the participants' information levels about risk factors on breast cancer is 4.15±2.73. It appears that the following groups of women have statistically significant higher total scores of information about breast cancer: those younger than fifty years old; high school and university graduates; those who have regular BSE; those who have previously had mammography; those whose family members have breast cancer history; those who have benign breast cyst or breast cancer; those who regard themselves as having medium or higher risks for breast

Table 2. Women's Perceived Breast Cancer Risk, History of Breast Cancer, and Reasons for Having Mammogram

Characteristics	n	%
Perceived breast cancer risk*		
No risk	146	29.7
Usual	219	44.6
Moderate	108	22.0
Strong	18	3.7
Family history of breast cancer		
No	438	83.0
Yes	87	16.5
Missing	3	0.6
Having breast disease		
No	333	63.1
Benign cyst or benign mass	158	29.9
Breast cancer	37	7.0
Having had a breast biopsy before		
Yes	139	26.3
No	389	73.7
Having mammogram before		
No	128	24.2
Yes	400	75.8
Mean mammogram number (M ± SD)		3.16±2.64
Last mammogram date		
≤2 years	303	75.8
>2 years	97	24.2
Having information for breast cancer and its screening methods		
Yes	389	73.7
No	139	26.3
Source of information**		
Physician	244	46.2
Radio/Television	182	34.5
Internet	50	9.5
Newspaper	79	15.0
Nurse	21	4.0
Reasons for current mammogram screening*		
Physician recommendation after clinical breast examination	266	50.5
Screening for breast cancer	223	42.3
Pain	76	14.4
Mass in the breast	67	12.7
Family history of breast cancer	47	8.9
History of breast cancer	41	7.8

*Women having breast cancer were not included, **More than one answer permissible

cancer; and those who previously informed about breast cancer and screening methods (Table 3).

Comparison of women's anxiety levels according to some characteristics

Table 4 presents a comparison between some characteristics of women and their anxiety scores. Mean anxiety score of the participants is found to be 1.65±1.61. The following characteristics of women are found to have a statistically significant effect on their anxiety scores: having breast cancer history in family (t=2.53; p<0.01), previous mammography experience (t=2.75; p<0.006), the existence of benign breast cyst or breast cancer (F=16.23; p<0.001) and the level of self-perceived risk for breast cancer (F= 29.47; p<0.001) (Table 4).

More specifically, the anxiety score of the women

Table 3. Comparison of Women's Knowledge Scores According to Some Characteristics

Characteristics	Mean	SD	t	p
Age (yr)			2.27	0.02
<50	4.42	2.55		
≥50	3.88	2.88		
Educational level			18.92*	<0.001
Elementary school	2.63	2.64		
Secondary school	3.43	2.75		
High school	4.52	2.54		
University	5.38	2.39		
Performed of BSE regularly			5.13	<0.001
Yes	4.54	2.57		
No	3.23	2.57		
Having mammogram before			2.06	0.03
Yes	4.29	2.73		
No	3.71	2.7		
Family history of breast cancer			3.25	0.001
No	3.98	2.75		
Yes	5.02	2.47		
Having breast disease			9.95*	<0.001
No	3.76	2.69		
Benign cyst or mass	4.7	2.65		
Breast cancer	5.27	2.8		
Perceived breast cancer risk			8.01*	<0.001
No risk	3.38	2.48		
Usual	4.15	2.82		
Moderate	4.88	2.61		
Strong	4.96	2.77		
Having information about breast cancer and its screening methods			3.69	<0.001
Yes	4.41	2.65		
No	3.42	2.82		

*F-statistic and p-value are based on the results of a one-way ANOVA

Table 4. Comparison of Women's Anxiety Scores According to Some Characteristics

Characteristics	Mean	SD	t	p
Having had a breast biopsy before			-3.76	0.01
Yes	2.05	1.71		
No	1.51	1.55		
Having had a breast surgery before			-2.61	<0.03
Yes	2.1	1.76		
No	1.57	1.61		
Having mammogram before			-2.68	0.08
Yes	1.76	1.65		
No	1.31	1.46		
Family history of breast cancer			-2.52	0.01
No	1.57	1.6		
Yes	2.05	1.67		
Having breast disease			16.07*	<0.001
No	1.39	1.55		
Bening cyst bening mass	1.93	1.56		
Breast cancer	2.8	1.72		
Perceived breast cancer risk			29.17*	<0.001
No risk	1.12	1.52		
Usual	1.4	1.39		
Moderate	2.33	1.61		
Strong	3.35	1.62		
Having information about breast cancer and its screening methods			0.49	<0.62
Yes	1.68	1.6		
No	1.6	1.65		

*F-statistic and p-value are based on the results of a one-way ANOVA

having breast cancer history in their family (M=2.05; SD=1.67) is found to be statistically significantly higher than that of those women with no breast cancer history in their family (M=1.57; SD=1.60). The anxiety score of the women who previously had breast biopsy (M=2.05; SD=1.71) is statistically significantly higher than that of those who have no previous breast biopsy (M=1.51; SD=1.55). In regard to breast operation, it is found that the anxiety score of those women who previously had breast operation (M=2.10; SD=1.76) is significantly higher than that of those who have no previous breast operation (M=1.57; SD=1.61). Similarly, it is found that the anxiety score of those women who had mammography before (M=1.76; SD=1.65) is much significantly higher than that of those who have their first mammography (M=1.30; SD=1.46). Further analysis indicates that the anxiety scores of the women having breast cancer (M=2.80; SD=1.72) and those of the women having benign breast cyst (M=1.93; SD=1.56) are significantly much higher than those of the women having no medical problem in regard to breast (M=1.39; SD=1.55). Finally, it is also found that the anxiety scores of women who regard themselves as having higher levels of risk for breast cancer (M=3.35; SD=1.62) and the anxiety scores of women who regard themselves as having medium levels of risk for bread cancer (M=2.33; SD=1.61) are significantly much higher than those of the women who regard themselves as having normal levels of risk for bread cancer (M=1.40; SD=1.39) and of the women who regard themselves as having no risk for bread cancer (M=1.10; SD=1.52) (Table 4).

Discussion

In this study, unlike the studies dealing with the reasons for not having mammography, the characteristics of the women who applied for mammography were analyzed in terms of risk factors about breast cancer, and the factors affecting their behavior of having mammography were identified. Moreover, this study has analyzed the information levels of women concerning risk factors about breast cancer, their risk perceptions and anxiety levels about breast cancer. The findings obtained are significant for planning of the interventions to improve the awareness of the women who have not applied for mammography and to increase the rate of women having mammography.

Several risk factors have been linked with breast cancer in the literature (Kearney and Murray, 2009; Brower, 2010; Secginli and Nahcivan, 2011). Certain reproductive variables (age at menarche, age at natural menopause, the interval between age at menarche and age at natural menopause, having a full-term pregnancy, breastfeeding history) strongly influence a woman's risk for developing breast cancer in her lifetime (Kearney and Murray, 2009; Brower, 2010; Yilmaz and Kıymaz, 2010; Secginli and Nahcivan, 2011). Nearly half of the participants in this study were older than fifty years old and therefore, they were in a risky age group for breast cancer. However, it was found that the participants were not in a highly risky group for breast cancer in terms of their menarche age, the first birth-giving age, menopause age and parity. In

the sample of the study, nearly two women in ten had breast cancer case in their family history. As it is well-established, having breast cancer history in family is an important factor for having breast cancer (McPherson et al., 2006; Kearney and Murray, 2009; Secginli and Nahcivan, 2011).

Approximately 5-10% of breast cancers are thought to be traced to a family history of the disease (McPherson et al., 2006). In a study conducted to determine the Turkish women's breast cancer risk factors, it was reported that, being greater than or equal to age 35 years old, having induced abortion, multiparity (≥ 1), late age at first birth (≥ 35 years old), late age at menopause (≥ 50 years old), body mass index (BMI) ≥ 25 and having first-degree family history of breast cancer were risk factors for breast cancer in Turkish women (Ozmen et al., 2009).

Mammography has been found to be the most consistent of the screening methods and is considered the gold standard for early detection of breast cancer (Khatcheressian et al., 2006). Magnus stated that, mammography screenings are effective and generate a 17% lessening in breast cancer mortality in women 39-49 years of age (Magnus et al., 2011). Most organizations in the United States support the use of mammography for average-risk women age 40 years and older (Kearney and Murray, 2009). Our study found that the majority of women had a mammogram (76%) two years ago. The rate of having mammogram was higher than the mammogram rates reported in other studies in Turkey. The rates of having mammogram were reported 10.1% in Akpınar et al. (2011) study among health care professionals 24-56 years of age; 17.5% in Yilmaz et al. (2011) study among academic women 22-63 years of age and 16.5% among housewives 20-65 years of age; 21.3% in Yavan et al. (2010) study among women 17-65 years of age; 37.5% in Nur's (2010) study among teachers 22-55 years of age. The other difference between the current study and the previous studies on breast cancer is about the age of the participants in that the sample of the previous studies included much younger subjects. On the other hand, there is consistency between our finding and that of the related studies of which the sample included women older than fifty years old in that the rate of the women having mammography is higher (López-de-Andrés et al., 2010; O'Donnell et al., 2010; Somanchi et al., 2010).

In this study the most common reason for mammogram screening was physician recommendation. Physician recommendation to have mammography has been found to be associated with women's use of mammography in the literature (Todd et al., 2001; Boxwala et al., 2010; Somanchi et al., 2010). Physicians' recommendations are found to motivate the women for having mammography. In a similar study, Somanchi et al. (2010) found that 11% of the women regarded the physicians' not recommending mammography as one of the reasons for not having it. Since the healthcare providers, especially physicians, are considered to be a trusted source of health information, it is significant that physicians and nurses who closely interact with individuals should inform them about breast cancer and screening. Therefore, healthcare staff working in protective healthcare services, including physicians and

nurses should have sufficient and updated information about breast cancer.

Most of the women had information about breast cancer and its screening in the current study. Leading source of information was reported as physicians. Television was also reported as an important source of breast cancer information. Unlike the findings of other related studies, our findings indicate that the most frequent information resource for breast cancer is television and the second one is information given by healthcare staff (Dündar et al., 2006; Götzsche and Nielsen, 2009; Nur, 2010). Therefore, it is safe to argue that media provides the public with significant information about cancer and the importance of screening, and that individuals use this information as a trigger for their behavior.

On the other hand, the knowledge level of breast cancer risk factors was low in the current study. This finding is similar to that of previous studies conducted in other countries (Oluwatosin and Oladepo, 2006; Wu and Ronis, 2009; Vahabi, 2011). It is generally agreed that women who are more knowledgeable about breast cancer risk factors and mammography are more likely to be screened (Jones et al., 2011). Current study results also showed that women who had mammogram before had more knowledge score. The other finding of our study is that those women with a history of breast cancer in their family have higher levels of information concerning the risk factors about breast cancer. Consistent with this finding, other studies also reported that women with a history of breast cancer in the family have more information on breast cancer, susceptibility and awareness of screening tests than other women (Dündar et al., 2006; Tastan et al., 2011). More specifically, Price et al. (2010) found that the rate of the women with a history of breast cancer in the family who have had the experience of mammography is 74%. Therefore, these findings suggest that these women have higher levels of information about both breast cancer and related risk factors, and that they much more frequently employ the screening methods.

Another finding of the current study is that those women with higher levels of educational background and those who have previously informed about breast cancer and screening methods have higher levels of information about risk factors concerning breast cancer. Women with a higher educational level were more likely to know about breast self-examination (BSE), to know about mammograms, and to practice BSE compared with those with a lower educational level (Rasu et al., 2011). Similar to this finding of this study, the previous studies indicate that more the level of educational background, higher the level of use of the breast cancer screening methods (López-de-Andrés et al., 2010; Park et al., 2011; Todd et al., 2011).

Although the anxiety levels of the women participated in the study is not much high, the following groups of women are found to have much higher levels of anxiety about breast cancer: those who have a previous experience of mammography, breast biopsy, breast operation, breast-related illness and breast cancer. Additionally, women with the self-perception of having more risk about breast cancer and with a history of breast cancer in their family

are also found to have higher levels of anxiety about breast cancer. It is concluded that some women with a history of breast cancer in their family or with an experience of breast cancer have negative experiences such as fear, anxiety, uncertainty and helplessness (Brain et al., 2008; Montgomery and McCrone, 2010; Tastan et al., 2011). One study dealing with young women with a history of breast cancer in their family indicates that women experience cancer anxiety before the screening and that this anxiety continues even the results of the screening are positive (Brain et al. 2008). The higher level of anxiety is reported to likely decrease the women's attempt to have screening (O'Donnell et al., 2010). Therefore, it may positively contribute to women's willingness to have screening that healthcare providers should pay attention to the anxiety of women with a history of breast cancer in their family or with a self-perception of having risks about breast cancer. They should seriously address the anxiety of such women and provide them with appropriate approach in order to help them in coping with their anxiety.

The results of this study are limited to the women applying to only one university hospital. Caution is recommended while interpreting the results for women from other parts of Turkey, including rural areas. In conclusion, this study, unlike the many studies, analyzed the factors affecting the mammography experience of the women applied for mammography. Women's ages, risk factors, risk perception, family history of breast cancer, and history of breast mass should be considered for the frequency of mammography screening. Also physician recommendation, screening for breast cancer, having breast-related complaints are important reasons to obtain mammography. Physicians and nurses working in primary healthcare services should inform and train all women about the diagnosis of breast cancer, screening methods and related risk factors. It is certain that such training should be continuous. Given that breast cancer is the most common cancer experienced by women both in the world and in Turkey, the fact that being a woman is the most significant risk factor for breast cancer should be emphasized. The results of this study can be helpful in promoting mammography adherence in Turkish women.

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