RESEARCH ARTICLE

Determining the Awareness of and Compliance with Breast Cancer Screening among Turkish Residential Women

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Abstract

Background: Breast cancer is the leading cause of cancer-related deaths in women. Despite being associated with high morbidity and mortality, breast cancer is a disease that can be diagnosed and treated early. Materials and Methods: In this cross-sectional study of 321 women, data were collected by Questionnaire, Breast Cancer Risk Assessment Form and Champion's Health Belief Model Scale. Mann-Whitney U, Kruskal-Wallis, Chi-squared tests and logistic regression were used in the statistical analysis. Results: It was found that only 2.2% of women have high and very high risk levels of breast cancer risk. There is a positive correlation between early diagnosis techniques and Health Belief Model Sub-Dimension scores which are sensibility, health motivation, BSE (Breast self-examination) self-efficient perception and negative correlation between mammography barrier score and BSE barrier score (p 0.05). When factors for not having BSE were examined, it was determined that the women who do not have information about breast cancer and the women who smoke have a higher risk of not having BSE. Conclusions: It is important to determine health beliefs and breast cancer risk levels of women to increase the frequency of early diagnosis. Women's health beliefs are thought to be a good guide for planning health education programs for nurses working in this area.

Keywords: Breast cancer - health belief model - early diagnosis - cancer screening compliance - Turkey

Asian Pacific J Cancer Prev, **14 (5)**, 3281-3288

Introduction

Breast cancer is the leading cause of cancer-related deaths in women (Thompson et al., 2005; Urkmez, 2009; Yilmaz, 2010; Ozmen, 2011; World Health Organization, 2011; American Cancer Society, 2012). While breast cancer is observed more frequently in developed countries, the mortality rates are higher in developing countries (Ozmen, 2011). Most incidences of breast cancer are observed in Canada, the USA, Spain and Sweden (World Health Organization, 2011). In 2011 in the USA, the number of newly diagnosed cases of breast cancer was 230,480, and the rate of deaths from breast cancer was 39,520 (American Cancer Society, 2012). In Turkey, breast cancer is the most widespread cancer type in women. According to Cancer Incidence, Mortality and Prevalence Worldwide (GLOBOCAN, 2008) data, the breast cancer incidence in Turkey is 25.6%, and the mortality rate is 17.6% (World Health Organization, 2011). While breast cancer is rarely observed in women under the age of 30, it shows a robust increase after this age. A marked increase occurs in postmenopausal years (Ozmen, 2011; American Cancer Society, 2012). According to the Turkish Breast Cancer Registry program, 45% of the breast cancer cases in Turkey have developed in the premenopausal period (Ozmen, 2011).

Despite being associated with high morbidity and mortality, breast cancer is a disease that can be diagnosed and treated early (Urkmez, 2009; Yilmaz, 2010; American Cancer Society, 2012). Breast self-examination (BSE), clinical breast examination (CBE) and mammography are the most commonly known and used screening programs in the world (Sadler et al., 2001; Thompson et al., 2005; Urkmez, 2009; Yilmaz, 2010; American Cancer Society, 2012). The literature suggests that women who conduct regular BSE discover breast cancer in earlier stages (Weiss, 2003). Furthermore, studies have reported that 80% of the masses in breasts were found during BSE (Weiss, 2003), and mortality was decreased by 19% (Ozmen, 2011). CBE plays a crucial role in large breasts, breasts that cannot be screened by mammography and those with peripheral masses. The cancer determination rate increases by 5-20% when CBE is applied with mammography (Philips, 1993; Sadler et al., 2001; Ho, 2006; Guney, 2009; Urkmez, 2009; World Health Organization, 2011; American Cancer Society, 2012). Mammography is also the most effective community-based screening method in the early detection of breast cancer (Thompson et al., 2005). With this method, masses and microcalcifications can be detected, and cancer can be clinically diagnosed at a rate of 85% (Thompson et al., 2005). With the use of mammography in the USA, deaths from breast cancer decreased by 30% in women between the ages of 50-74 and by 17% in women between the ages of 40-49 (Thompson et al., 2005). The

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literature has suggested that it is important to combine the use of BSE, CBE and mammography for the early detection of breast cancer (Guney, 2009; Urkmez, 2009; Ozmen, 2011; American Cancer Society, 2012).

However, in studies that have analyzed participation in screening programs, the rate of doing regular BSE is between 7% and 38.8%, even though women have information about BSE (Petro-Nustas et al., 2002; Jahan et al., 2006; Okobia et al., 2006; Wong-Kim et al., 2006; Tu et al., 2006; Montazeri et al., 2008). The rate of undergoing CBE varies between 18% and 92% (Cohen, 2006; Jahan et al., 2006; Avci et al., 2007; Montazeri et al., 2008; Koc et al., 2009; Han et al., 2009). When early diagnosis studies in Turkey (Merey, 2002; Dundar et al., 2006; Koc et al., 2009; Urkmez, 2009) are compared with studies in other countries (Buki et al., 2007; Zackrisson et al., 2007; Ryerson et al., 2008; Wall et al., 2008), they reveal that women in Turkey have fewer mammograms.

To increase the participation of women in breast cancer screening programs, society's socioeconomic and cultural characteristics, as well as attitudes and beliefs about screening practices, should be studied (Urkmez, 2009; Yilmaz, 2010). The Health Belief Model (HBM) is a common method used by nurses for studying the factors that influence an individual's actions regarding health (Harrison et al., 1992; Champion et al., 2000; Sadler et al., 2001; Dundar at al., 2006; Karayurt et al., 2007).

This study is conducted to determine the health belief perceptions of breast cancer screening programs among residential women

Materials and Methods

Study population

This research was a cross-sectional study conducted with 321 women between 20 and 69 years old in 365 houses in a residential area. The women agreed to participate in the study between May 30 and October 15, 2011.

Data collection

Research data were collected in 3 forms that were prepared as the result of a literature review.

Questionnaire: This form consists of 24 questions that determine the participants' socio-demographic characteristics (8 questions), anthropometric measurements (2 questions), reproductive health and obstetric histories (10 questions) and breast cancer knowledge levels and screening practices (4 questions).

Breast cancer risk assessment form: The "Breast Cancer Risk Assessment Form" was developed by the American Cancer Society and is recommended for risk assessment by the Ministry of Health of the Republic of Turkey. The form was used to determine the risk of having breast cancer among women.

The Breast Cancer Risk Assessment Form is composed of 6 parts and 21 sub-items. The items include the age, family breast cancer history, individual breast cancer history, childbearing age, menstrual history and body structure (Body Mass Index (BMI); less than 18.5 kg/m^2 was categorized as underweight, 18.5-24.9 kg/m^2 as normal, and more than 24.9 kg/m^2 as overweight). By grading the answers to the risk factors included in this form, total scores determined the levels of risk as low (scores of 200 and below), moderate (scores between 201-300), high (scores between 301-400) and highest (scores above 400) (Eroglu et al., 2010).

Champion's health belief model scale: The Champion's Health Belief Model Scale (CHBMS, 1984) was adapted to Turkish by Gozum and Aydin in 2003. Validity and reliability research was conducted on Turkish women (Gozum et al., 2004). The scale is composed of 52 items and 8 sub-scales, including "susceptibility", "caring/seriousness", and "health motivation", which assess perceptions about breast cancer and general health; "barriers", "benefits" and "self-efficacy/confidence" about BSE; and "benefits" and "barriers" to undergoing mammography. A 5-point Likert-type scale ("strongly disagree" 1, "disagree" 2, "undecided" 3, "agree" 4, strongly agree" 5) was used in the assessment of the scale. Each dimension of the scale was assessed separately, and the dimensions were not combined in a total score.

Implementation of the research: Data were collected by face-to-face survey interviews conducted by the researchers during home visits. The average duration of the data collection was 25 minutes for each woman.

Evaluation of the data: The computer program SPSS 15.0 (Statistical Package for the Social Sciences) was used in the analysis of data. Percentages (%) and means and standard deviations ($\bar{X}\pm SD$) were used for descriptive statistics. The compatibility with a normal distribution was analyzed with a one-sample Kolmogorov-Smirnov test. Mann-Whitney U, Kruskal-Wallis and Chi-squared tests were used in the statistical analysis. For the variables that were thought to influence the risk of not performing BSE, univariate and multivariate logistic regression analyses were conducted. The value of $p<0.05$ was used to indicate statistical significance.

Ethical principles: The approval of an ethics committee was obtained prior to the research from Gulhane Military Medical Academy (GATA) Ethics Committee. Information about the purpose and implementation of the study was provided to the participants, and written consent was obtained from the participants.

Results

The average age of the women participants was 38.50 (±7.07; Min, Max=21, 67), and the majority of the participants were between 20-49 years old (94.6%, n=303). A total of 50.2% (n=161) of the women were university graduates, and most of the women (60.4%, n=194) did not work. The average monthly family income was 3,588. Turkish Liras (TL) (±1,250.62; Min, Max=1,000, 10,000). Almost all of the participants were married (94.4%, n=303) and had a nuclear type of family (94.7%, n=304) (Table 1).

When breast cancer risk factors were evaluated, 8.7% (n=28) of the participants had a history of breast cancer in their families, and 2.2% (n=7) of the participants had a history of personal breast cancer; 82.2% (n=264) of the participants had their first child before the age of 30, 6.2%

(n=20) had no children and 81.6% (n=262) had undergone menarche between the ages of 12-14; and 39.3% (n=126) of the participants were overweight. When the risk factors were considered, 93.5% (n=300) of the women had a low risk for breast cancer, 4.4% (n=14) had a moderate risk and 2.2% (n=7) had a high or extremely high risk. A majority (92.2%, n=296) of the women had not entered menopause, and only 21.8% (n=70) of the women used a family planning method, including hormones. Finally, 29.0% (n=93) of the women were smokers.

In our study, 79.8% (n=256) of the participants had been informed about breast cancer; this information was most often obtained from medical staff (48.3%, n=155) or the Internet (12.5%, n=40). While the best indicator of breast cancer was the existence of a mass in the breast (89.7%, n=288), the least effective indicator was the abnormal swelling of the arm (14.3%, n=46)

Regarding participants' knowledge of breast cancer and screening, the relationship between obtaining information and undergoing regular screening tests was statistically significant ($p<0.05$). Among the women who were informed about breast cancer, 28.1% (n=72) performed BSE, 21.5% (n=55) had CBE and 15.6% (n=40) underwent regular mammograms.

The average sub-dimension scores of the Health Belief Model Scale (HBMS) revealed that the perceived benefits of BSE (15.96±2.29) and the perceived self-efficacy of CBE (35.13±6.92) had the highest scores (Table 2). The average HBM sub-dimension scores and the variables considered in the study were compared, and the statistically significant relationships are shown in Table 3.

A statistically significant difference ($p<0.05$, Table 3) was found between the sub-dimension score for susceptibility and education level ($\chi^2=9.195$, $p=0.027$), marital status ($\chi^2=-2.872$, $p=0.004$), family history of breast cancer ($Z=12.253$, $p=0.002$), personal history of breast cancer ($\chi^2=-3.254$, $p=0.001$), breast cancer risk level ($\chi^2=12.790$, $p=0.005$) and undergoing mammography ($Z=-2.104$, $p=0.035$).

The sub-dimension score for caring/seriousness was

Table 1. Distribution of Participants According to Socio-demographic Characteristics (N=321)

Characteristics		Frequency	%
Age	$\bar{X}$±SD=38.50±7.07 (Min=21, Max=67, Median=38)		
	20-49	303	94.6
	50+	18	5.4
Education Level	Primary School	36	11.2
	High School	112	34.9
	University	161	50.2
	Postgraduate	12	3.7
Employment Status	Working	127	39.6
	Not Working	194	60.4
Income Status	$\bar{X}$±SD=3588.47±1250.62 (Min=1000 TL, Max=10000 TL, Median=3500 TL)		
	<3000 TL	154	48
	≥3000 TL	167	52
Marital Status	Married	303	94.4
	Single	8	2.5
	Widowed or Divorced	10	3.1
Family Type	Nuclear	304	94.7
	Extended	15	4.7
	Scattered	2	0.6
Total		321	100

*Abbreviations: $\bar{X}$, mean; SD, standart deviation; Min, minimum; Max, maximum; TL, Turkish Lira (Turkish currency)

Table 2. Health Belief Model Scale Sub-Dimension Score Averages

Sub-Dimension	$\bar{X}$±SD	Min-Max	Cronbach -Alfa	Element No
Susceptibility	7.18±3.30	3-15	0.78	3
Seriousness	19.71±4.12	6-30	0.75	6
Motivation	19.98±3.01	5-25	0.80	5
BSE Benefit	15.96±2.29	4-20	0.80	4
BSE Barrier	17.20±4.35	8-40	0.83	8
BSE Self-Efficacy	35.13±6.92	10-50	0.93	10
Mammography Benefit	18.94±2.44	5-25	0.66	5
Mammography Barrier	25.31±5.85	11-55	0.83	11

*$\bar{X}$, mean; SD, standart deviation; Min, minimum; Max, maximum

Table 3. Distribution of Health Belief Model Scale Sub-Dimension Score Averages According to Women's Characteristics (N=321)

Characteristics	Health Belief Model Scale Sub-Dimension Score Averages													
	Susceptibility		Seriousness		Health Motivation		BSE Benefit		BSE Barrier		BSE Self-Efficacy		Mammography Benefit		Barrier	
	Statistical Analysis	p	Statistical Analysis	p	Statistical Analysis	p	Statistical Analysis	p	Statistical Analysis	p	Statistical Analysis	p	Statistical Analysis	p	Statistical Analysis	p
Education Level[a]	9,195	**0.027**	2,797	0.424	9,426	**0.024**	0.826	0.843	5,479	0.140	4,081	0.253	4,253	0.235	13,015	**0.005**
Marital Status[a]	3,709	0.157	1,092	0.579	0.393	0.822	11,444	**0.003**	4,052	0.132	4,820	0.090	0.328	0.849	1,697	0.428
Employment Status[b]	-2,872	**0.004**	-2,309	**0.021**	-1,843	0.065	-0.185	0.853	-0.061	0.951	-0.548	0.584	-1,167	0.243	-2,541	**0.011**
Family Breast Cancer History [a]	12,253	**0.002**	0.521	0.771	1,547	0.461	0.092	0.955	0.489	0.783	7,191	**0.027**	0.250	0.883	2,122	0.346
Individual Breast Cancer History [b]	-3,254	**0.001**	-0.879	0.379	-0.502	0.615	-1,692	0.091	-1,716	0.086	-1,976	**0.048**	-0.523	0.601	-0.297	0.766
Childbearing Age [a]	3,731	0.155	1,050	0.592	7,047	**0.029**	4,021	0.134	5,682	0.058	0.185	**0.912**	0.213	0.899	1,495	0.474
Breast Cancer Risk Level[a]	12,790	**0.005**	4,440	0.218	2,343	0.504	3,960	0.266	3,839	0.279	11,551	**0.009**	0.318	0.957	4,464	0.216
Obtained Information[b]	-0.173	0.863	-0.872	0.383	-3,188	**0.001**	-1,328	0.184	-1,799	0.072	-7,274	**0.000**	-0.118	0.906	-1,785	0.074
BSE Perform[b]	-1,879	0.060	-0.408	0.683	-2,788	**0.005**	-1,789	0.074	-3,943	**0.000**	-5,307	**0.000**	-1,872	0.061	-2,753	**0.006**
Have CBE[b]	-1,509	0.131	-0.015	0.988	-0.870	0.384	-0.602	0.547	-1,741	0.082	-3,540	**0.000**	-1,963	0.050	-3,302	**0.001**
Have Mammogram[b]	-2,104	**0.035**	-0.639	0.523	-0.797	0.426	-0.841	0.400	-0.587	0.557	-2,497	**0.013**	-0.599	0.549	-3,598	**0.000**

*BSE, breast self-examination; CBE, clinical breast examination, [a] Kruskal Wallis, [b]Mann-Whitney U

Table 4. Univariate and Multivariate Logistic Regression Analyses of Variables that Affect the Risk of Not Performing BSE

Variables		Univariate				Multivariate			
		p	OR	95% CI		p	OR	95% CI	
				Lower Limit	Upper Limit			Lower Limit	Upper Limit
Education Level	Primary School	**R**							
	High School	0.417	1,612	0.509	5,104				
	University	0.943	1,046	0.309	3,535				
	Postgraduate	0.880	0.869	0.140	5,399				
Employment Status	Working	**R**							
	Not Working	0.423	0.685	0.272	1,726				
Marital Status	Single	**R**							
	Married	0.179	0.237	0.029	1,936	0.264	0.349	0.055	2,215
	Widowed or Divorced	0.733	1,689	0.083	34,485	0.103	6,732	0.681	66,513
Smoking	No	**R**							
	Yes	**0.012**	2,564	1,225	5,367	**0.010**	2,432	1,232	4,802
BMI		0.864	1,009	0.914	1,113				
No of Live Births		0.214	1,343	0.843	2,138	0.068	1,454	0.972	2,173
Menopause	Has Entered	R							
	Has Not Entered	0.771	0.751	0.109	5,170				
Obtained Information	Yes	**R**							
	No	**0.020**	3,732	1,234	11,286	**0.035**	3,052	1,082	8,613
Breast Cancer Risk Level	Low	**R**							
	Moderate	0.138	4,582	0.612	34,310				
	High	0.602	0.465	0.026	8,227				
	Extremely High	0.733	0.606	0.034	10,732				
Susceptibility Score Average		0.092	0.887	0.772	1,020	0.114	0.913	0.816	1,022
Seriousness Score Average		0.882	1,006	0.932	1,085				
Motivation Score Average		0.155	0.914	0.807	1,035				
BSE Benefits Score Average		0.735	1,028	0.876	1,206				
BSE Barriers Score Average		0.435	1,038	0.945	1,139				
BSE Self-Efficacy Score Average		0.002	0.892	0.829	0.960	**0.000**	0.873	0.820	0.930
Mammography Benefits Score Average		0.131	1,105	0.971	1,259				
Mammography Barriers Score Average		0.125	1,056	0.985	1,131				
Age Groups	20-49	**R**							
	50+	0.397	2,580	0.287	23,155				

*BSE, breast self-examination; R, reference group; CI, confidence interval; OR, odds ratio; BMI, body mass index

higher among working women than among non-working women, and the difference between the groups was statistically significant (Z=-2.309, p=0.021, Table 3).

There was a statistically significant difference (p<0.05, Table 3) between the sub-dimension of health motivation and education level (χ^2=9.426, p=0.024), childbearing age (χ^2=7.047, p=0.029), obtaining information about breast cancer (Z=-3.188, p=0.001) and performing BSE (Z=-2.788, p=0.005).

There was a statistically significant difference between marital status and the sub-dimension of the perceived benefits of BSE (Z=11.444, p=0.003, Table 3). The perceived benefits of BSE score among married, widowed and divorced women were higher than that of single women.

The perceived barriers to BSE among women who performed BSE were higher than the perceived barriers among women who did not perform BSE, and the difference between the scores was statistically significant (Z=-3.943, p<0.001, Table 3).

Statistically significant differences (Table 3) were found between the sub-dimension of BSE self-efficacy and family history of breast cancer (Z=7.191, p=0.027), personal history of breast cancer (χ^2=-1.976, p=0.048), breast cancer risk level (Z=11.551, p=0.009), obtaining information about breast cancer (Z=-7.274, p<0.001), performing BSE (Z=-5.307, p<0.001), undergoing CBE (Z=-3.540, p<0.001) and undergoing mammography (Z=-2.497, p=0.013).

Statistically significant differences (Table 3) were found between the sub-dimension of mammography barriers and education level (χ^2=13.015, p=0.005), employment status (Z=-2.541, p=0.011), performing BSE (Z=-2.753, p=0.006), undergoing CBE (Z=-3.302, p=0.001) and undergoing mammography (Z=-3.598, p<0.001).

No statistically significant differences were found with the perceived benefits of mammography (Table 3).

The variables affecting the risk of not performing BSE were evaluated by univariate and multivariate logistic regression analyses (Table 4). When primary school education was used as the reference, being a high school or university graduate increased the risk of not performing BSE by 1.612-fold and having postgraduate education decreased the risk of not performing BSE by 0.869-fold; however, these coefficients were not statistically

significant. The risk of not performing BSE among women who did not obtain information about breast cancer was 3.732-fold higher than among those who obtained information, and the increase was statistically significant ($p<0.05$). The risk of not performing BSE among smokers was 2.564-fold higher than among non-smokers, which was also statistically significant ($p<0.05$). The risk of not performing BSE among women 50 years old and older was 2.580-fold higher than the risk among women 49 years old and younger, but this increase was not statistically significant. The risk of not performing BSE among women who had not entered menopause was 0.751-fold lower than the risk among women who had entered menopause, and this decrease was not statistically significant (Table 4).

Discussion

A majority of the women in this study were between 20-49 years old, and the average age was 38.50 (±7.07; Min, Max=21, 67) (Table 1). Breast cancer showed a parallel increase with age (Vogel, 2000; Eroglu et al., 2010; World Health Organization, 2011; American Cancer Society, 2012). As the average life expectancy in Turkey was 72.2 in 2010 and life expectancy is expected to increase in the coming years (Human Development Report, 2011), the present research suggests that breast cancer will pose an increasing risk for Turkey.

Education level is an important factor in the practices regarding breast cancer and early diagnosis (Merey, 2002; Dundar et al., 2006; Avci et al., 2007). In our study, women had at least a primary school education, and more than half of the women had obtained university and postgraduate degrees (Table 1). The monthly income of the family and the employment status of the women are important variables in terms of the accessibility of health services (Dundar et al., 2006; Koc et al., 2009; Urkmez, 2009; Eroglu et al., 2010). In our study, a majority of the women did not have wage-earning employment and were in middle-income families. However, all women had health insurance.

If a woman or a first degree relative (mother, sister or daughter) has had breast cancer, the woman has 2-4 times higher risk of having breast cancer (Merey, 2002; Koc et al., 2009; Han et al., 2009; Eroglu et al., 2010; American Cancer Society, 2012). In our study, previous breast cancer histories were found in first-degree relatives of 8.7% of the participants, and only 2.2% of the participants had a history of breast cancer.

The long-term influence of hormones, particularly estrogen, on breast tissue increases the risk of breast cancer (Vogel, 2000; American Cancer Society, 2012). Age of menstruation and being overweight also pose breast cancer risks. If the age of first menstruation is under 12, the risk of breast cancer increases; furthermore, each year of delay in menarche decreases the risk of cancer by 20% (American Cancer Society, 2012). In Vogel's study, the risk of having breast cancer in women whose age of first menstruation was 11-14 years old was 10-30% higher than in women whose age of first menstruation was 16 years old (Vogel, 2000). In our study, women whose menarche age was 12 and above formed the majority. Because of the production of estrogen in fat cells and the relationship between estrogen and breast cancer, being overweight increases the risk of breast cancer (American Cancer Society, 2012). In studies that investigate the risk of being overweight, it was found that 25-76% of women with breast cancer were overweight (Koc et al., 2009; Eroglu et al., 2010; Yilmaz et al., 2010). Body structure was evaluated in our study, and 39.3% of the women were overweight.

Tobacco and oral contraceptives are also risk factors for breast cancer (Terry et al., 2002; American Cancer Society, 2012). According to the Turkish Population and Health Survey data in 2008, oral contraceptives are the least favored family planning (FP) method, with a use rate of 4-5% (Turkey Demographic and Health Survey 2008; 2009). According to Yilmaz, 1 out of every 3 women use an FP method that includes hormones (Yilmaz et al., 2010). In our study, 1 out of every 5 women used an FP method that included hormones. Even though the relationship between smoking and breast cancer is debatable, some studies indicate that long-term and passive smoking may increase the risk of cancer (Terry et al., 2002). In the literature, the frequency of smoking in women varies between 4.9% and 37.0% (Terry et al., 2002; Koc et al., 2009; Urkmez, 2009). One-third of the women (29.0%) that participated in our study were smokers.

In many studies, information about the early diagnosis of breast cancer in women was insufficient, and one of the most important factors that prevents screening practices was the lack of information (Champion et al., 2000; Ahmad et al., 2005; Dundar et al., 2006; Secginli et al., 2006; Karayurt et al., 2008; Koc et al., 2009). In our study, the majority of women had information about breast cancer, and this group had a positive and statistically significant relationship with regular BSE performance, CBE practice and mammography exams ($p<0.05$). The literature suggests that nurses are effective at providing health education that improves awareness about the early diagnosis of breast cancer and participation in screening programs (Champion et al., 2000; Secginli et al., 2006; Avci et al., 2007; Edwards et al., 2009; Koc et al., 2009). Education is important for early diagnosis because women learn the symptoms of breast cancer. A mass in the breast is the first symptom that is identified in approximately 65.3% of patients who have breast cancer (Urkmez, 2009). Among our participants, the best-known indicator (89.7%) of breast cancer was the existence of a mass in the breast.

The participants' breast cancer risk levels were examined with the breast cancer risk assessment model. Accordingly, 2.2% of the women were in the high/extremely high risk level. In the study of Eroglu et al., however, 0.7% of the participants were at high risk (Eroglu et al., 2010).

In this study, the attitudes and beliefs that influenced women's practices of breast cancer screening were evaluated with the HBM scale. Perceptions of susceptibility/predisposition, one of the sub-dimensions of the HBM, describe an individual's perceived risk of a disease. An individual whose perception of susceptibility/predisposition is high will implement early diagnosis practices (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Karayurt et

al., 2007; Karayurt et al., 2008; Guney, 2009). In our study, the average score on the susceptibility/predisposition sub-dimension was 7.18 (±3.30). Moreover, the average susceptibility score among women who receive regular mammograms was higher than among women who do not receive regular mammograms ($p<0.05$, Table 3). Mammography is a screening method that is used when the risk of having breast cancer is high (at the ages of 40-50 and in women who have a high risk) (Ozmen, 2011; World Health Organization, 2011; American Cancer Society, 2012). For this reason, susceptibility scores of women who have regular mammograms are expected to be higher. Although the study of Speedy and Hase (2000) is consistent with our research, there are studies showing that susceptibility perceptions are not different among women who have regular mammograms compared to women who do not (Merey, 2002; Avci, 2007).

Jirojwong and MacLennan (2002) show that the perception of susceptibility has an effect on BSE practice (Jironjwong and MacLennan, 2002). In some studies, women performing BSE had high perceptions of susceptibility (Secginli et al., 2006; Karayurt et al., 2007). However, there are studies, such as ours, in which no significant difference was found between implementing early diagnosis practices and susceptibility scores (Table 3) (Merey, 2002; Dundar et al., 2006; Ho, 2006; Yilmaz et al., 2010).

The seriousness/caring sub-dimension includes perceptions that there will be harmful results and concerns for the threatening situation that is created by breast cancer (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Avci et al., 2007; Karayurt et al., 2007; Karayurt et al., 2008; Guney, 2009). In our study, the average seriousness/caring score was 19.71 (±4.12). However, no statistically significant differences were found between perceptions of seriousness and the implementation of early diagnosis practices. Different results were obtained by Turkey (Gozum et al., 2004; Avci et al., 2007; Karayurt et al., 2007; 2008; Guney, 2009) and other studies in the literature (Harrison et al., 1992; Jironjwong et al., 2002; Petro-Nustas et al., 2002; Lee-Lin et al., 2007; Kilic et al., 2009). For example, while a positive relationship was observed between the perception of seriousness and having mammograms (Guney, 2009) and performing BSE (Gozum et al., 2004), there are also studies (Petro-Nustas et al., 2002) in which the perceptions of seriousness were low among women who performed regular BSE within the last year. However, in our study, the women who perceived breast cancer as a serious problem for their health did not translate their views into early diagnostic practices.

Health motivation includes general intentions and desires to develop practices for maintaining and improving one's health (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Avci et al., 2007; Karayurt et al., 2007; 2008; Guney, 2009). In our study, perceptions of health motivation were high among women performing BSE ($p<0.05$, Table 3). In some studies, there are no differences between women who perform BSE and women who do not (Dundar et al., 2006; Guney, 2009). However, in our study, contrary to expectations, health motivation scores were lower among women who underwent CBE and had a mammogram ($p<0.05$). While there are studies that show no significant differences in health motivation scores between having CBE and mammograms (Yilmaz et al., 2010), there are also studies indicating that perceptions of motivation are higher among women who had mammograms compared to those who did not (Avci et al., 2007).

The perceived benefits include the perceived positive aspects of protective practice (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Avci et al., 2007; Karayurt et al., 2007; Karayurt et al., 2008; Guney, 2009). In our study, the perceived benefits of BSE were high. Our study was consistent with other studies conducted in Turkey (Avci et al., 2007; Guney, 2009; Kilic et al., 2009).

BSE barriers represent perceived internal and external barriers to performing BSE in breast cancer screening (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Guney, 2009; Avci et al., 2007; Karayurt et al., 2007; Karayurt et al., 2008). In our study, the average perceived barriers to BSE score was 17.20 (±4.35). The perceived barriers to BSE were significantly lower among women who performed BSE compared to women who did not perform BSE ($p<0.05$, Table 3). The conditions that have been highlighted in the literature as barriers to performing BSE include time limitations, lack of knowledge and ability, lack of self-confidence for performing the examination, having doubts about the effectiveness of BSE, fear of breast cancer, forgetting to perform BSE and discomfort and difficulty performing the examination (Jironjwong et al., 2002; Merey, 2002; Secginli et al., 2006; Karayurt et al., 2007; Karayurt et al., 2008; ; Guney, 2009; Yilmaz et al., 2011).

Self-efficacy represents individual competence in implementing a health practice (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Avci et al., 2007; Karayurt et al., 2007; Karayurt et al., 2008; Guney, 2009). In our study, perceptions of self-efficacy were significantly higher among women who implemented early diagnosis practices compared to women who did not implement early diagnosis practices ($p<0.05$, Table 3). This situation shows that women with high perceptions of self-efficacy implement other screening methods as well as BSE. Similar to our study, women who perform BSE have been shown to have high perceptions of self-efficacy (confidence) (Merey, 2002; Petro-Nustas et al., 2002; Dundar et al., 2006; Secginli et al., 2006; Karayurt et al., 2008; Guney, 2009; Kilic et al., 2009; Yilmaz et al., 2010). In our study, the women who performed BSE considered themselves to be competent at conducting the practice. However, whether women with high self-efficacy scores practice BSE properly should be studied.

The perceived benefits of mammography are the perceptions of positive results and benefits of mammography (Harrison et al., 1992; Speedy et al., 2000; Jironjwong et al., 2002; Gozum et al., 2004; Avci et al., 2007; Karayurt et al., 2007; Karayurt et al., 2008; Guney, 2009). Contrary to our expectations, no significant differences were found between the

perceived benefits of mammography among women who have regular mammograms compared to women do not have mammograms. In the literature, there were no significant differences between the perceived benefits of mammography among women who had a mammogram compared to women who did not have a mammogram (Merey, 2002; Lee-Lin et al., 2007; Guney, 2009). This result suggests that women decide to be examined for different purposes, such as routine menopause examinations, and they have mammograms at the doctor's request.

In our study, the average perceived barriers to mammography score was 25.31 (±5.85). The perceived barrier to mammography was significantly lower among women who had a mammogram compared to women who had not ($p<0.05$, Table 3). This finding shows that as the perceived barriers decrease for women who have regular mammograms, the frequency of screening tests increases. Literature reporting low scores for mammography barriers among women who have mammograms is compatible with our study (Merey, 2002; Dundar et al., 2006; Secginli et al., 2006; Lee-Lin et al., 2007; Guney, 2009).

BSE is a woman's periodic, systematic examination to identify unusual masses and changes in the shape in the breast tissue and surrounding region (Guney, 2009; Urkmez, 2009; World Health Organization, 2011). Breast cancer in women who perform regular BSE is detected in an earlier phase than in women who do not perform regular BSE; as the stage decreases, the rate of survival increases, and the masses in the breast are noticed by the women themselves at a rate of 80% during BSE (Weiss, 2003). Thus, mortality has been shown to be decreased by as much as 19% (Ozmen, 2011). For this reason, we used univariate and multivariate logistic regression analyses to evaluate the variables that affect the risk of not performing BSE.

When primary school education was considered as the reference for the risk of not performing BSE, postgraduate education decreased the risk of not performing BSE ($p<0.05$, Table 4). The literature also reports that women with high education levels perform BSE more frequently (Sadler et al., 2001; Jironjwong et al., 2002; Petro-Nustas et al., 2002; Guney, 2009; Kilic et al., 2009; Urkmez, 2009). The assumption is that as women's levels of education increase, knowledge of and abilities to protect their health increase, they have self-efficacy for the initiatives related to their health, and the frequency of performing BSE increases.

Having been educated on breast cancer predicts the performance of BSE. Literature reports that women who have been educated about breast cancer perform BSE more frequently than women who have not been educated about breast cancer (Petro-Nustas et al., 2002; Weiss, 2003; Dundar et al., 2006; Ho, 2006; Avci et al., 2007; Guney, 2009). In our study, the risk of not performing BSE was significantly higher among women who had no education about breast cancer compared to women who had been educated ($p<0.05$, Table 4). Education about breast cancer and BSE increases awareness of the seriousness of the disease and increases compliance with early diagnostic practices.

In our study, the risk of not performing BSE increased among women who smoked ($p<0.05$, Table 4). Jirojwong and MacLennan (Jironjwong et al., 2002) also report that health motivations are low among women who smoke, and they have an increased risk of not performing BSE.

In our study, women who were 50 years old and above had a higher risk of not performing BSE compared to women 49 years old and below ($p<0.05$, Table 4). Some studies suggest that age does not affect the risk of not performing BSE (Jironjwong et al., 2002; Petro-Nustas et al., 2002; Dundar et al., 2006; Karayurt et al., 2008). However, young women (ages 20-39) have been shown to perform BSE more regularly than other age groups (Cohen, 2006). On the contrary, some studies have reported that older women perform BSE more regularly than young women (Petro-Nustas et al.; 2002 Guney, 2009). For example, women at the age of 50 and above do not feel the need to perform BSE because they have regular mammograms. The fact that the health motivations of these women are low suggests that this increases the risk of not performing BSE.

When menopause status was considered as the reference for another factor that affects the risk of not performing BSE, the risk of not performing BSE decreased among women who had not entered menopause ($p<0.05$, Table 4). The assumption is that women who have not entered menopause are younger and more sensitive to protecting and maintaining their health, so they have a reduced risk of not performing BSE.

The multivariate regression analysis also found that smoking status, obtaining information about breast cancer and increases in the self-efficacy score were statistically significant predictors of not performing BSE ($p<0.05$).

As a result, nurses should know the society they serve in terms of risk factors of breast cancer, and they should determine the risk levels for each patient. To increase women's compliance with screening practices, nurses should know the health beliefs affecting the screening practices. They should take women's beliefs that affect screening practices (predisposition, seriousness, BSE benefits, BSE barriers, confidence, mammography benefits, mammography barriers and health motivation) into consideration while planning breast health education. Nurses should encourage women to participate in screening programs that are appropriate for their age groups, and nurses should follow up with patients.

One limitation of this research is that the study represents the characteristics of one local group. The results cannot be generalized to other populations.

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