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Determining the health beliefs and breast cancer fear levels of women regarding mammography

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Background/aim: Women's fears and health beliefs impact their participation in early breast cancer diagnosis approaches. This study was conducted to determine the health beliefs and fear levels of women older than 50 regarding mammography.

Materials and methods: A cross-sectional study was conducted in Turkey. The study cohort consisted of 300 women selected by cluster sampling who agreed to participate in the study. A health belief model scale and breast cancer fear scale were used in data collection. Descriptive statistics, t-test, chi-square test, and correlation analysis were used in the data analysis.

Results: Participants had an age average of 59.88 ± 6.49 years, and 86.3% were illiterate. Only 34.7% of women stated that they had had a mammogram in the past. The women's average scores on the lower dimensions of the health belief model scale were determined as follows: 6.52 ± 2.81 for sensitivity perception, 18.49 ± 5.22 for seriousness perception, 16.80 ± 4.31 for health motivation perception, 15.83 ± 3.89 for mammography benefit perception, and 28.74 ± 8.35 for mammography barrier perception. The score average of the breast cancer fear scale was determined as 23.81 ± 9.71.

Conclusion: We observed that women's health beliefs and breast cancer fear levels impacted their participation in mammography.

Key words: Breast cancer, health beliefs, breast cancer fear

1. Introduction

Breast cancer is an important public health problem since it can often be a terminal illness. It is diagnosed at a rate of 23% among all women's cancer types worldwide, with breast cancer reported as affecting 1.38 million in 2008 (1). In Turkey, it is the most frequent cancer type among women; while its incidence was 37.6 per 100,000 in 2006, this rate had increased to 41.6 by 2008 (2).

There is no one method implicitly preventing breast cancer today. It is, however, possible to extend the woman's lifetime and provide a complete recovery with the help of regular breast examinations and screenings in hopes of early diagnosis. There are 3 methods that are suggested for early diagnosis in breast cancer that complement each other. These methods are breast self-examination, clinical examination by medical personnel, and mammography (3). Mammography is one of the most effective screening methods in the early diagnosis of breast cancer (4).

In some studies, it was observed that well-educated women (5–8), those with a higher monthly income (5,8), and those with social security (5) were screened with mammography. In other studies it was also observed that well-educated women were screened with mammography (8,9,10).

Studies of breast cancer early diagnosis behaviors in women show that current practices are not sufficient (11–13). Low rates of early diagnosis suggest the presence of various factors influencing women's attitudes and behaviors regarding early screening options. These include factors such as an individual's cultural beliefs, health/disease perception, family and environmental support, and knowledge and risk perception about the disease, as well as their belief in strategies for early identification of the disease (14–16). The findings of various studies (17,18) have shown that there are important connections between women's attitudes and their behaviors regarding early diagnosis and health beliefs.

The behaviors of individuals towards the protection and development of health have been explained with models. These models have also guided studies on

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positively changing women's health behaviors (19). The health belief model (HBM) is the most frequently used model for enhancing early diagnosis behaviors in breast cancer. Key concepts of the HBM assert that the relevant health behaviors will emerge if individuals: 1) perceive the disease as a sensitivity; 2) believe in outcomes regarding the seriousness of the disease; 3) be aware of both the benefits and disadvantages of screenings (such as shame or fear of developing breast cancer); and 4) note that there are positive motivations (such as education, media, warnings reminding about health control, disease of a friend or a family member, and obtaining information from others) in taking action concerning the screening (16,20–22). In the literature, it has been reported that the most important component of the model is the perception barrier. A key barrier that prevents the realization of protective health behavior in women is the fear of developing breast cancer (23–25).

Healthcare professionals, such as public health nurses, contribute to the increase of women's early diagnosis behaviors through various nursing interventions such as trainings (19). Studies have shown the need to increase breast cancer awareness and early diagnosis behaviors by structuring nursing interventions, supported by models, to regularly examine these behaviors and determine women's health beliefs (26).

This study was performed to determine the health beliefs and breast cancer fear levels of women older than 50 regarding having a mammogram.

2. Materials and methods

This cross-sectional study was conducted in a family health center area in Turkey between October and December 2013. While the study population consisted of 546 women in the age group of 50–70 years living in a region of the family health center, the sample comprised 300 women who agreed to participate in the study. The 30-cluster sampling technique of the World Health Organization was used in the sample selection, which resulted in reaching 10 individuals in each cluster and 300 in total. There were 30 streets selected using a simple random method as the starting point. From the starting point of the third house from the beginning of the street, the process continued along the right side until there were 10 individuals from each street being selected who met the inclusion criteria. A form with 6 questions, which was developed by researchers after reviewing the literature, was used in the data collection process. In addition to receiving expert opinions in the development of the forms, a pilot study was performed with 15 women; any obscure questions were revised. In addition to this researcher-developed form, the Health Belief Model Scale (30 items) and Breast Cancer Fear Scale (8 items) were used.

Health Belief Model Scale: Since being developed by Champion in 1984, this scale was revised in 1993, 1997, and 1999 (14). Lower dimension reliability coefficients of the scale vary between 0.60 and 0.78, 0.80 and 0.93, 0.65 and 0.90, and 0.75 and 0.88, depending on the revision year. During breast cancer screenings, we used the sections within the Health Belief Model Scale that were pertinent to mammography, which was translated into Turkish by Gözüm et al. (27). The scale has no general total score; a total score of each dimension is used instead. The scale is a Likert-type instrument with responses graded from 1 to 5, where 1 point corresponds with 'strongly disagree' and 5 points corresponds with 'strongly agree'. The higher scores obtained from lower dimensions signify the greater perception of that lower dimension. Cronbach's alpha coefficient varies between 0.69 and 0.83 for the entire scale and lower dimensions (27).

Breast Cancer Fear Scale: The Breast Cancer Fear Scale was developed by Champion et al. in 2009 (28). Cronbach's alpha coefficient is 0.91 for the entire scale. This scale was tested in terms of its validity and reliability in Turkey by Seçginli in 2012 (29). The Turkish version of the scale consists of 8 items, and while the minimum score is 8, the maximum score is 40. The scale grading is as follows: 1 point corresponds with 'strongly disagree' and 5 points with 'strongly agree'. High scores signify a higher level of breast cancer fear, with Cronbach's alpha coefficient being 0.90 (29).

The data were evaluated by using SPSS 11.5 for Windows. Descriptive statistics (number, percentage, mean), t-test, chi-square, and correlation analysis were used in the data analysis. While independent variables of the study included sociodemographic features, dependent variables included health beliefs and fear levels. In order to conduct the study, the required permissions were obtained from the ethics committee of the university and from participants.

3. Results

Participants had an age average of 59.88 ± 6.49 years. Among the participants, 13.0% were literate and had attended primary school, 62.7% were married, and 81.7% had health insurance. A total of 34.7% of women who participated in the study stated that they had had mammography in past years. When the rate of mammography was analyzed in reference to women's educational backgrounds, a significant correlation was found ($\chi^2 = 2.318$, $P = 0.314$).

Examining the women's scores from the lower dimensions of the Health Belief Model Scale, the score averages were determined as follows: 6.52 ± 2.81 for sensitivity perception, 18.49 ± 5.22 for seriousness perception, 16.80 ± 4.31 for health motivation perception, 15.83 ± 3.89 for mammography benefit perception, and

28.74 ± 8.35 for mammography barrier perception. The score average of the Breast Cancer Fear Scale was determined as 23.81 ± 9.71.

As seen in Table 1, the literate and primary school-educated women had significantly higher score averages of sensitivity perception (P = 0.000), seriousness perception (P = 0.000), health motivation perception (P = 0.005), and mammography benefit perception (P = 0.007) compared to illiterate women. Similarly, score averages were significantly higher compared to illiterate women. The score averages of the Breast Cancer Fear Scale were also higher in this group compared to the illiterate women; however, no significant difference was determined between them as a result of statistical analysis (P = 0.165).

Score averages of women regarding the mammography barrier perception showed a significant increase among those with health insurance compared to women without health insurance (P = 0.002).

The score averages of HBM and Breast Cancer Fear Scale were examined according to marital status, and single women had higher score averages. Married women had higher score averages for sensitivity perception compared to single women, and the difference between them was not found to be statistically significant (P = 0.896).

The women's history of having mammography and score averages of the HBM and Breast Cancer Fear Scale were measured. Results showed the score averages of sensitivity perception (P = 0.032), seriousness perception (P = 0.000), health motivation perception (P = 0.005), mammography benefit perception (P = 0.007), mammography barrier perception (P = 0.000), and breast cancer fear scale (P = 0.000). This indicates a significant score increase in

Table 1. Average score distributions from the Health Belief Model Scale and Breast Cancer Fear Scale according to some sociodemographic features of women and their histories with mammography.

	Health Belief Model Scale					
	Sensitivity perception	Seriousness perception	Health motivation perception	Mammography benefit perception	Mammography obstacle perception	Breast cancer fear scale
	X ± SD	X ± SD	X ± SD	X ± SD	X ± SD	X ± SD
Educational Status						
Illiterate	6.43 ± 2.78	16.98 ± 5.95	16.53 ± 4.41	15.57 ± 3.82	29.09 ± 8.45	23.46 ± 9.91
Literate and primary school	11.00 ± 3.65	20.73 ± 5.38	18.38 ± 3.51	17.43 ± 4.14	26.51 ± 7.19	25.84 ± 8.17
t	–7.326	–3.917	–2.897	–2.734	1.765	–1.393
P	0.000	0.000	0.005	0.007	0.079	0.165
Health insurance						
available	7.00 ± 3.25	17.38 ± 6.14	16.82 ± 4.39	15.73 ± 3.98	28.15 ± 8.50	23.72 ± 9.41
N/A	6.95 ± 3.37	17.73 ± 5.39	16.49 ± 4.13	16.15 ± 3.63	31.57 ± 6.93	23.87 ± 11.19
t	0.112	–0.392	0.508	–0.717	–3.146	–0.100
P	0.911	0.695	0.612	0.474	0.002	0.920
Marital status						
Married	6.99 ± 3.27	17.39 ± 6.00	16.72 ± 4.32	15.77 ± 3.93	28.76 ± 8.36	23.68 ± 9.77
Single	6.80 ± 3.42	20.00 ± 5.96	19.40 ± 5.73	18.00 ± 2.35	29.40 ± 7.50	28.00 ± 7.45
t	0.131	–0.962	–1.373	–1.267	–0.170	–0.983
P	0.896	0.337	0.171	0.206	0.865	0.326
Previous mammography						
Yes	7.58 ± 3.64	19.87 ± 6.13	18.89 ± 3.18	18.37 ± 3.83	24.05 ± 7.00	27.27 ± 9.01
No	6.68 ± 3.01	16.15 ± 5.53	15.63 ± 4.46	14.44 ± 3.22	31.25 ± 7.91	21.89 ± 9.62
t	2.157	5.328	7.327	8.906	–7.778	4.713
P	0.032	0.000	0.000	0.000	0.000	0.000

women who had mammography compared to those who did not, and the difference between them was found to be statistically significant.

As seen in Table 2, there was a positive, moderate, and significant (r = 0.388, P = 0.000) relation between the score averages of women regarding the Breast Cancer Fear Scale and sensitivity perception; a positive, strong, and significant (r = 0.647, P = 0.000) relation with the score average of seriousness perception; and a positive, moderate, and significant (r = 0.377, P = 0.000) relation with the score average of health motivation perception. There was also a positive, strong, and significant (r = 0.333, P = 0.000) relation with the score average of mammography benefit perception and a positive, weak, and insignificant relation (r = 0.039, P = 0.498) with the score average of mammography barrier perception.

4. Discussion

In the literature it has been stated that, among the women between the ages of 40 and 69, mammography decreases mortality at the rate of 25%–35% (30–34). Studies report that the rate of women having mammography varies between 10.5% and 40.6% (35,36). In parallel with the literature, this study determined a low rate of women having mammography (34.7%). In one study, the rate of women who had had mammograms in the previous 2 years was found to be 45% (8).

In the research, no difference was detected between the educational backgrounds of the women and the rate of having their mammograms. However, in one study, it was found that the rate of women having had a mammogram increased among higher-educated women (8). In the present study, there was no difference detected between the educational level and the rate of having mammograms. This may be related to the fact that most of the women in this study's sample group were illiterate.

Perceptions aimed at health beliefs in the lower dimensions of the HBM are very important in realizing women's protective health behaviors. Among these perceptions, the perceived sensitivity dimension is one of the strongest perceptions shown to influence individuals to adopt healthy behaviors. The perceived sensitivity increases in parallel with women's evaluation of the risk of having breast cancer, and it decreases in the opposite scenario (37,38). The possibility of taking a protective action increases in parallel with higher scores of perceived sensitivity. It is therefore necessary to make individuals more aware that the disease might always exist as a risk factor in their lives (37).

In this study, the sensitivity perception was found to be higher in literate and primary school-educated women and married women who also had health insurance and mammography performed in the past. In one study examining the relation between the perceived sensitivity in women and having a mammogram, it was determined that women with higher perceived sensitivity had 0.74 times greater rates of having mammography compared to women with lower sensitivity. The same study determined a negative, weak, and insignificant (r = –0.29) relation between the perceived sensitivity and having mammography (39). However, there are also studies asserting that there is no significant relation between the perceived sensitivity and having mammography (14,40). The fact that the sensitivity perception was high in the present study might have been caused by the women considering themselves at risk simply due to being women.

Another perception, perceived seriousness, expresses the individual's personal beliefs regarding the seriousness of disease. Contextualization of sensitivity and seriousness is defined as the perceived threat. In cases where the perceived seriousness is high, the possibility of displaying the protective health behavior also increases (37).

Table 2. The relationship between women's health belief scores and breast cancer fear scores.

	Breast Cancer Fear Score	
	r	P
Perceived sensitivity score	0.388*	0.000
Perceived seriousness score	0.647*	0.000
Perceived health motivation score	0.377*	0.000
Mammography benefit perception score	0.333*	0.000
Mammography obstacle perception score	0.039	0.498

*P < 0.01.

In this study, literate and primary school-educated women and single women without health insurance were determined to have a higher seriousness perception. Women who had previously had mammography showed a higher seriousness perception compared to those who did not, and the difference between them was found to be statistically significant (P = 0.000). Another study asserted that a woman who has comprehended the seriousness of breast cancer and considers herself at risk of developing breast cancer has a greater tendency to have mammography compared to another woman of the same age (37).

The fact that many societies perceive cancer as a serious illness may restrain the effect of the seriousness perception on an individual's behaviors regarding breast cancer. Since almost all women consider breast cancer a serious condition, the perceived seriousness is indicated as the weakest determinant of the HBM (41). Results concerning the seriousness perception in the present study might have been caused by cancer being perceived as a serious illness in Turkish society, just as in many other societies.

Perceived health motivation is another important perception that is effective on protective health behaviors. It refers to the state of eagerness aimed at realizing the behavior in sustaining and developing health. According to the HBM, women with a high health motivation perception will have higher tendencies to have regular mammograms (41).

In this study, we found that literate and primary school-educated women and single women with health insurance had a higher health motivation perception. Additionally, women who had regular mammograms had a higher health motivation perception compared to those who did not, and the difference between them was found to be statistically significant (P = 0.000).

Various studies have reported that health motivation had a positive effect on the decision to have mammography (42,43). In their study, Gözüm et al. stated that peer training increased women's health motivation (38). Dündar et al. determined a positive relation between breast cancer knowledge, health motivation, and pursuing mammography (44). The higher health motivation scores in the present study could be explained as an indicator of women's eagerness and recognition of the early diagnosis behaviors for breast cancer.

Perceived benefit is the advantage associated with decreasing the risk of developing disease as a result of a certain behavior that the person thinks will provide a benefit (41).

In this study, literate and primary school-educated women and single women without health insurance were found to have a higher benefit perception. The difference between the benefit perception of women who had had mammography and those who had not was found to be statistically significant (P = 0.000). This contrasts, however, with results from another study that reported no difference between mammography frequency and the perceived benefit (40).

Perceived barrier refers to the barrier that obstructs the realization of the suggested behavior or negative aspects of the behavior and is considered the strongest separator of the HBM. These barriers have also been used in evaluating the factors affecting other protective behaviors (such as immunization behaviors, prenatal behaviors, and smoking behaviors), as well as breast cancer early diagnosis/screening behaviors over many years (22–26,35,36). In our study, we determined that illiterate single women without health insurance who did not have a history of mammography had a higher barrier perception. In their 5-year study, Russell et al. (40) examined the effect of health beliefs on the frequency of having mammography, finding that participation in screenings was associated with the participants' educational level. In a study performed with Chinese-American women aged 40–85 years, Yu and Wu stated that access to medical services, perceived barrier, and information search behavior were all effective for promoting the use of mammography services (45). Another study determined that women who had had mammography 4–5 times within the last 5 years had a lower perceived barrier. The same study determined a relation between the barrier perception and the frequency of having mammography (40). It is important to first determine the barrier in order to promote the early diagnosis behaviors. Similar to medical knowledge about protective health behaviors, this condition is also associated with the balance between the barrier perceived by the individual and the perception of benefits in her/his life. While the benefit perception has a positive relation with screening behaviors, the barrier perception has a negative relation. It is therefore important to increase the perceived benefit and decrease the perceived barrier in order to implement positive health behaviors (22). The fact that the barrier perception was low in the present study might have positively affected the behavior of having mammography.

In this study, we determined that literate and single women without health insurance who had had previous mammograms also had higher levels of breast cancer fear. An increase was determined in breast cancer fear levels of women in parallel with the increase of their score averages of sensitivity, seriousness, health motivation, and benefit and barrier perception. Despite being among the most frequently mentioned fear types, the fear of having a diagnosis of breast cancer is one of the most important barriers for women to realize the benefit of screening behaviors (19,24,46–48). This fear, however, has also been identified as a facilitating factor in some studies (46–48).

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