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# Mammography Self-Efficacy Scale and Breast Cancer Fear Scale

## Psychometric Testing of the Turkish Versions

### KEY WORDS

Breast cancer  
Fear  
Mammography  
Nursing  
Psychometric evaluation  
Self-efficacy  
Turkish women

**Background:** Self-efficacy for mammography and breast cancer fear are important determinants to mammography use. No tools to measure these beliefs of Turkish women have been validated. **Objective:** The purpose of this study was to assess the psychometric characteristics of the Turkish versions of the Mammography Self-Efficacy Scale (MSS-T) and the Champion Breast Cancer Fear Scale (CBCFS-T). **Methods:** Mammography Self-Efficacy Scale and Champion Breast Cancer Fear Scale were translated to Turkish language, validated by an expert panel, back translated, and tested. Cronbach  $\alpha$  coefficients and item-total correlations were measured to evaluate the reliability of the scales. Exploratory factor analysis was used to estimate construct validity of the scales. Independent  $t$  tests,  $\chi^2$  tests, and logistic regression analyses were used to test theoretical relationships. **Results:** Factor analysis yielded 1 factor for MSS-T and 2 factors for CBCFS-T with eigenvalues greater than 1. Internal consistency values presented acceptable Cronbach  $\alpha$  levels of .90 for MSS-T and .90 for CBCFS-T, and test-retest reliability correlations were 0.56 for MSS-T and 0.60 for CBCFS-T. **Conclusions:** The MSS-T and CBCFS-T demonstrated acceptable preliminary values of reliability and validity. Further psychometric testing is recommended with women living in different regions of Turkey. **Implications for Practice:** The scales can offer insights to nurses and other healthcare professionals about mammography self-efficacy beliefs, emotional needs, and concerns of Turkish women related to breast cancer fear. The scales may be useful as process measures to assess the efficacy of interventions designed to alter self-efficacy and fear and subsequently improve the mammography rates.

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The author has no funding or conflicts of interest to disclose.

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Accepted for publication August 14, 2011.  
DOI: 10.1097/NCC.0b013e3182331a9a

**B**reast cancer is the most common type of cancer in women worldwide. It has been estimated that 1 of every 8 women living in Western countries is likely to be afflicted by breast cancer in her lifetime.<sup>1</sup> In Turkey, breast cancer is the leading cause of cancer mortality among women with an age-adjusted incidence rate of 35.5 per 100 000.<sup>2</sup> More specifically, it is currently the most common female cancer, accounting for 25.6% of all cancers diagnosed among women, and in 2008, a total of 10 065 new cases of breast cancer were diagnosed in Turkey.<sup>3</sup>

Mammography screening is currently considered the “gold standard” to reduce breast cancer mortality and is recommended every 1 to 2 years starting at 40 years.<sup>4</sup> The ratio of performing mammography at regular intervals is still low in Turkey.<sup>5–7</sup> Lower rates of cancer screening contribute to the trend of late-stage diagnosis among Turkish women. In Turkey, according to the most recent reports of the “Izmir Cancer Incidence and Data Collection Project” initiated in 1991, nearly two-thirds of women with breast cancer had been diagnosed in stage III and IV.<sup>8</sup> Thus, initiatives related with early detection of breast cancer are imperative to reduce cancer mortality in Turkey.

There are many factors that may influence mammography behavior. The structural and behavioral factors such as income and educational level, insurance, physician recommendation, knowledge, and health beliefs (susceptibility, seriousness, benefits, barriers, and health motivation) have been found to affect the low mammography rates of women.<sup>7,9–13</sup> Although less studied, self-efficacy and breast cancer fear beliefs were also cited as important determinants of mammography use.<sup>12,14–16</sup>

Understanding the associations between self-efficacy, breast cancer fear, and mammography use may have important implications for explaining differences in mammography behavior among women. It may also improve the ability to identify women who are more likely to be adherent to mammography and implicate designing interventions to increase mammography utilization and adherence rates through increasing self-efficacy and reducing fear of breast cancer.<sup>16–18</sup>

In the literature, the examination of standardized measures of women’s self-efficacy beliefs related to mammography and fear beliefs specific to breast cancer has been attempted in several studies.<sup>12,16–19</sup> In Turkey, possibly because of the lack of extensively validated mammography self-efficacy and Breast Cancer Fear Scales, the mammography studies frequently include other health beliefs rather than self-efficacy and fear. In addition, little is known about the relationship of self-efficacy and breast cancer fear with mammography use for Turkish women. To date, valid and reliable instruments for determining the beliefs of self-efficacy to mammography use and breast cancer fear of Turkish women have not been reported.

## Overview of Self-Efficacy

The term *self-efficacy* or similar construct is a part of the most health behavior theories. It is the concept of an individual’s belief or perceived confidence for coordinating and carrying out a specific action that influences whether a specific action

is taken.<sup>20,21</sup> The self-efficacy beliefs are defined as “cognitions that determine whether health behavior change will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and failures.”<sup>20–22</sup>

The concept of self-efficacy is based on Bandura’s social cognitive theory.<sup>23</sup> According to the theory, self-efficacy postulates that 2 types of expectancies influence behavior: (a) self-efficacy belief and (b) outcome expectation. Perceived self-efficacy is the self-decision about the ability level in doing something. Outcome expectation is the self-decision about the positive or negative outcomes resulting from the behavior. Therefore, self-efficacy judgment plays a role in determining which activities a person will take or avoid. To gain a sense of self-efficacy, a person can complete a skill successfully, observe someone else doing a task successfully, acquire positive feedback about completing a task, or rely on physiological cues.<sup>23–25</sup> In terms of feeling, the higher the level of self-efficacy, the higher the levels of goals people set for themselves, which leads to a higher level of commitment to the goals.<sup>13,20,24–26</sup>

In the literature,<sup>14,20,26</sup> it is suggested that by focusing on the self-efficacy construct, greater success at health promotion and behavior change might be achieved. In several studies, it has been shown that self-efficacy is an important variable for many health behaviors such as physical exercise, alcohol consumption, adherence to medication, condom use, smoking cessation, breast self-examination (BSE), and mammography.<sup>10,12,14,18,22,26–28</sup>

The association between self-efficacy and mammography behavior is widely reported.<sup>9,10,13,28</sup> These studies highlight the importance of increasing women’s self-efficacy in motivating women to use mammograms. Related with mammography, self-efficacy is the women’s confidence in her ability to complete steps needed to obtain a mammogram (to arrange transportation to get the mammogram, to pay and make an appointment for the procedure, to find a place to have the mammogram, etc) and may be particularly central in moving women from thinking about getting mammograms to obtaining them.

The relationship of self-efficacy to mammography has been reported with different types of instruments with limited items related with mammography procedure. In an instrument to measure self-efficacy for mammography, all steps in the behavior should be assessed to gain the best predictive power.<sup>18</sup> One of the few self-efficacy instruments that was included all steps in the mammography process was developed by Champion et al.<sup>18</sup>

## Overview of Breast Cancer Fear

Fears about cancer were first described in the 1940s and have been highlighted since the 1960s. It is considered as the essential part of the health-related behavior and defined as a negatively toned emotion accompanied by a high level of physiological arousal stimulated by a threat that is perceived to be significant and personally relevant.<sup>29</sup> The concept of fear was originated from Extended Parallel Process Model, developed by Witte<sup>30</sup> in 1992. The Extended Parallel Process Model posits the cognitive and emotional factors associated

with message processing and related these processes to a fear appeal's success or failure.

It has been reported that fear of breast cancer is associated with breast cancer screening behaviors.<sup>11,16,17,31</sup> Currently, it is unclear whether fear acts as a barrier or motivator of cancer screening. On the one hand, the fear of cancer has been linked to poorer screening, and on the other hand, it is associated with a higher likelihood of screening.<sup>19,32-34</sup> But in recent studies, it has been shown that moderate levels of fear induce screening behaviors, whereas low levels promote inactivity and high levels promote avoidance of the behavior.<sup>17,31</sup> The inconsistent findings related with the association of fear about cancer and health behavior were explained by Andersen et al<sup>31</sup> as "compared with very low levels of worry, moderate levels of worry support an optimal level of arousal and vigilance that motivate people to use screening, and high levels of worry and fear in contrast are hypothesized to provoke cognitive defenses, including efforts to reduce immediate distress." Related with breast cancer screening, it is mentioned that moderate fear will motivate the individual who believes the threat of breast cancer can be reduced by taking action (ie, engaging in screening). Furthermore, if fear is too high, the behavioral response to control the fear will result in avoidance rather than participation in screening, and if fear is too low, the motivation for change will not be present.<sup>17</sup>

In the literature, the reviews showed that the present instruments for measuring breast cancer fear may not adequately assess the fear construct.<sup>32,33</sup> Champion et al<sup>17</sup> made a conceptualization of fear specific to the threat of breast cancer and developed the Breast Cancer Fear Scale to measure the physiological arousal and subjective aspects of the fear construct. The scale includes items related with emotional and physiological response to the threat of breast cancer.

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## ■ Methods

### Aim

The aim of the study was to determine the psychometric properties of the Turkish versions of the Mammography Self-Efficacy Scale (MSS-T) and Champion Breast Cancer Fear Scale (CBCFS-T).

### Participants

The study sample included mothers of the students and their family member aged 41 years and older at 1 public primary school. The inclusion criteria were (1) being 41 years and older, (2) not having a history of breast cancer, (3) not being pregnant or breastfeeding, and (4) having the ability to read and write Turkish. The sample size for the study was computed based on the requirement to conduct an exploratory factor analysis. For this, it is recommended that there should at least be 10 participants per item.<sup>35</sup> For the 10-item MSS and 8-item CBCFS, a sample of 180 women would be required. To ob-

tain an adequate final sample size, a total of 275 questionnaires were distributed to women aged 41 years and older. Among these, 244 participants returned their questionnaires, giving a response rate of 89%. Twelve participants were not eligible for the study, and 8 participants did not complete all items in the questionnaire. Thus, 224 participants were included in the reliability and validity analyses.

## Instruments

Data were collected using a self-administered questionnaire and the MSS-T and CBCFS-T. The questionnaire obtained information about the participants' sociodemographic characteristics (such as age, marital status, number of children, educational and employment status, income level, length of residence in Istanbul, health insurance coverage, and health status) and other informations (such as having breast cancer screening history, receiving information about breast cancer, having first-degree relative with breast cancer, having breast health problems, and receiving physician's recommendation for mammography).

### MAMMOGRAPHY SELF-EFFICACY SCALE

The Mammography Self-Efficacy Scale (MSS) consists of 10 items and is scored on a 5-point Likert scale from strongly agree (5) to strongly disagree (1) with a total possible score<sup>18</sup> of 10 to 50. It assesses the perceived efficacy about the process of having a mammogram. The scale included mammography process steps such as arranging transportation and other things in life, being able to talk with people at the mammography facility about concerns, getting a mammogram if not worried, finding a way to pay, and making an appointment and how to go about getting a mammogram. Higher total scores indicate higher possibility to have a mammogram. The reliability and validity of the scale were tested, and the Cronbach  $\alpha$  coefficients of .87 and .88 were found for African American and white women, and African American women, respectively.<sup>9,18</sup>

### CHAMPION BREAST CANCER FEAR SCALE

The CBCFS is an 8-item instrument developed by Champion et al.<sup>17</sup> It determines the relationship between women's emotional responses to breast cancer and mammography behavior and examines breast cancer fear as a mediator of screening behavior or attempts to modify fear through interventions. It includes items related with the intrusive thoughts such as feeling scared, upset, edgy, uneasy, and anxious and physiological arousal such as feeling nervous, getting depressed, and having increased heart rate. The scale was scored on a 5-point Likert scale from strongly agree (5) to strongly disagree (1), with a total possible score of 8 to 40. A subject with a higher score feels more fear about breast cancer. Low fear was defined as a total score of 8 to 15; moderate fear, as a score of 16 to 23; and high fear, as a score of 24 to 40. The reliability and validity of the scale were tested, and the Cronbach  $\alpha$  coefficients of .91 and .94 were found for African American and white women, and African American women, respectively.<sup>9,17</sup>

## Design

This instrumentation study was carried out between May and December 2010 in Istanbul. The study consisted of 2 phases: (1) translation and back translation with establishment of content validity and (2) instrument testing.

### TRANSLATION AND BACK TRANSLATION

The process of translation and adaptation of instrument that was developed by World Health Organization was used in the study.<sup>36</sup> After receiving permissions from Victoria Champion for modifying the self-efficacy and fear scales, a bilingual language expert and the author made the item-by-item translation of the scales independently from English into Turkish. The translated versions of the scales were submitted to expert panel of 8 specialists to identify and resolve the inadequate expressions and inconsistencies of the translation. Then another bilingual translator was invited to back translate the scales from Turkish to English. Finally, item-by-item comparisons were conducted by the author and 1 nursing professor who is familiar with instrument adaptation between the back-translated English and the original English versions to make sure the translation was conceptually and linguistically appropriate.

The expert panel members (1 pathologist who is the coordinator of the Istanbul city cancer control and the member of the national breast cancer early diagnosis and screening committee, 4 nursing faculty members of general surgical department, 2 nursing faculty members of psychiatry department, 1 nursing faculty member of public health department) examined the content validity of the preliminary MSS-T and CBCFS-T. Related with MSS-T, minor changes in wording were made in 4 items based on comments made by the panel experts to match with the Turkish version because of differences in cultural and language levels. The word *transportation* was translated as “my car or transportation vehicles” (item 1). The words “related with breast cancer and mammography” were added at the end of item 3: “I can talk to people at the mammogram center about my concerns.” In item 6, the phrase “find a way to pay for a mammogram” was changed to “Even if my health insurance does not pay for a mammogram, I can pay the fee for a mammogram.” And the phrase “know how to go about getting a mammogram” was changed to “know where, when, how to go and which official procedure should I get for getting a mammogram” (item 9). Related with CBCFS-T, no changes in wording were made based on expert review.

### INSTRUMENT TESTING

Upon completion of the translations of the scales, data collection was started using the translated self-efficacy and fear scales and demographic and breast health questionnaire. Names of women aged 41 years and older were acquired from the records of the school guidance center where the study sample was recruited. A letter including the instruments and an informed and written consent form was sent home with each child and returned to school. They were asked to return the

instruments even if they did not wish to participate. The letters were collected in 2 to 3 weeks.

## Data Collection

Approval was received from the administration of the school where the participants were recruited. Written and signed consent was obtained from all the participants, and participation in the study was voluntary. Data were collected between September and December 2010. A pilot study assessed the clarity and readability of the T-MSS and CBCFS-T with 21 women who were not included in the main study. Participants were asked to determine the translated scales' clarity and ease of reading and understanding. Based on the pilot test, no changes were recommended in 2 scales. For test-retest reliability, data were collected within a 4-week interval from a subsample of 29 women. The self-efficacy scale can be applied in 10 to 15 minutes, and the fear scale can be applied in 8 to 12 minutes.

## Data Analysis

The data were analyzed using the Statistical Package for Social Sciences version 18 (SPSS Inc, Chicago, Illinois). Sociodemographics and breast health-related characteristics were analyzed through descriptive analyses. The 10-item MSS-T and 8-item CBCFS-T were examined separately for the reliability and validity. Pearson's correlation test was used for test-retest reliability. The reliability of the MSS-T and CBCFS-T was evaluated by measuring internal consistencies and item-total correlations. The desired criteria of item-total correlation of higher than 0.30 and  $\alpha$  levels equal to or higher than .70 were considered desirable. To examine validity, a content validity index (CVI) was used. Exploratory factor analysis using the principal component method with varimax rotation was performed, and factors with eigenvalues greater than 1.0 were identified to estimate construct validity of the scales. The Kaiser-Meyer-Olkin (KMO) test was used to measure sample adequacy, and the Bartlett Test of Sphericity (BTS) was used to examine the correlation matrix. The criteria for retaining an item in a scale included an associated minimum factor loading coefficient<sup>37</sup> of 0.30. The independent *t* tests,  $\chi^2$  tests, and logistic regression analysis were used to test theoretical relationships. For all statistical analyses, a 2-sided *P* value of less than .05 was considered to be statistically significant.

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## Results

### Demographic Characteristics

The characteristics of the sample are shown in Table 1. The mean (SD) age of the sample was 46.97 (6.68) years (range, 41–70 years); most of them were married (86%) and had 2 or more children (81%). Over half of the sample had attended school for more than 9 years. Most participants (71%) were not working, and their perceived income level was in the middle (77%). With regard to health status perception, more

**Table 1 • Characteristics of Study Participants (N = 224)**

Characteristics	n (%)
Age, y	
41–49	159 (71)
50 and older	65 (29)
Mean (SD)	46.97 (6.68)
Range	29
Min-max	41–70
Marital status	
Married	192 (85.7)
Not married	32 (14.3)
No. of children	
No child	15 (6.7)
One child	27 (12.1)
Two or more children	182 (81.2)
Educational status	
Illiterate	16 (7.1)
Primary (1–8 y)	94 (42)
Secondary (9–12 y)	26 (11.6)
Tertiary (13+ y)	88 (39.3)
Employment status	
Working	65 (29)
Not working	159 (71)
Perceived income level	
Very bad/bad	16 (7.1)
Middle	173 (77.3)
Good/very good	35 (15.6)
Health insurance	
Yes	166 (74.1)
No	58 (25.9)
Residence in Istanbul	
Mean (SD)	34.27 (13.86)
Median	37
Range	61
Min-max	3–64
Perceived health status	
Very bad/bad	9 (4)
Middle	84 (37.5)
Good/very good	131 (58.5)
Has a first-degree relative with breast cancer	
Yes	37 (16.5)
No	187 (83.5)
Having breast problems as pain, nipple discharge, and lump	
Yes	46 (20.5)
No	178 (79.5)
Receipt of breast cancer information	
Yes	140 (62.5)
No	84 (37.5)
Breast self-examination	
Regularly done (monthly)	53 (23.7)
Never or irregularly done	171 (76.3)
Clinical breast examination	
Done in previous year	102 (45.5)
Never or irregularly done	122 (54.5)
Mammography test	
Done in previous 2 y	99 (44.2)
Never or irregularly done	125 (55.8)
Having a physician referral	
Yes	104 (46.4)
No	120 (53.6)

than half of the participants (59%) reported being in good/very good health. More than two-thirds of the participants had health insurance. The length of residence in Istanbul was from 3 to 64 years, the median was 37 years, and the mean (SD) was 34.27 (13.86) years.

Most of the sample had not had a first-degree relative with breast cancer (84%). One-fifth of them indicated that they had breast problems such as pain, nipple discharge, and lump. Nearly two-thirds (63%) of the sample reported that they had received breast cancer information, and one-quarter (24%) of the sample performed BSE at regular monthly intervals. About half (46%) of them reported that they had had a clinical breast examination (CBE) in previous year. Nearly half of the sample (46%) reported that they had a physician referral for having a mammography, and 44% had had last mammography in previous 2 years (Table 1).

## Reliability

### INTERNAL CONSISTENCY AND ITEM-TOTAL CORRELATION ANALYSIS

Item means, SDs, item-total correlations, and Cronbach  $\alpha$  coefficients of the scales were assessed. For the 10-item MSS-T, Cronbach  $\alpha$  correlation coefficient was .90 and the corrected item-total correlations of each item ranged between 0.54 and 0.76 ( $P < .01$ , Table 2). On the basis of the 8-item CBCFS-T, the Cronbach  $\alpha$  correlation coefficient was .90, and the corrected item-total correlations of each item ranged between 0.57 and 0.79 ( $P < .01$ , Table 3).

### STABILITY

The stability of the scales was examined by test-retest reliability with 29 women at 4-week intervals. The coefficient of 0.56 was found for the MSS-T, and a coefficient of 0.60 was found for the CBCFS-T ( $P < .01$ , Table 4).

## Validity

### CONTENT VALIDITY INDEX

Content validity index was used to quantify the extent of agreement between the experts in the study. The expert panel was asked to rate the feasibility and relevance of each item on a scale from 1 (irrelevant) to 4 (highly relevant and succinct). The CVI of the scale was calculated by dividing the number of items rated 3 or 4 by the total number of items, and greater than 80% was regarded as a standard for testing expert validity.<sup>36</sup> The CVI for MSS-T was 96.2, and the CVI for CBCFS-T was 100, which indicated that the 2 scales were acceptable for further use.

## Factor Structure

### TURKISH MAMMOGRAPHY SELF-EFFICACY SCALE

A principal components analysis with Varimax rotation was performed on the 10-item MSS-T. Bartlett Test of Sphericity and KMO measure of sampling adequacy were performed to

**Table 2 • Factor Loadings, Item Analysis, and the Item-Total Correlations for the 10 Items in the Turkish Mammography Self-efficacy Scale (N = 224)**

Self-efficacy	Factor Loading Factor 1 <sup>a</sup>	Item Mean (SD)	Corrected Item/Total Correlation	$\alpha$ if Item Deleted
1. I can arrange transportation to get a mammogram	<b>0.698</b>	3.80 (1.03)	0.61	.89
2. I can arrange other things in my life to have a mammogram	<b>0.734</b>	3.82 (.93)	0.66	.89
3. I can talk to people at the mammogram center about my concerns	<b>0.620</b>	3.73 (.98)	0.54	.90
4. I can get a mammogram even if I am worried	<b>0.798</b>	3.92 (.88)	0.73	.89
5. I can get a mammogram even if I do not know what to expect	<b>0.743</b>	3.89 (.96)	0.66	.89
6. I can find a way to pay for a mammogram	<b>0.676</b>	3.61 (1.10)	0.60	.90
7. I can make an appointment for a mammogram	<b>0.810</b>	3.80 (1.06)	0.74	.89
8. I know for sure I can get a mammogram if I really want to	<b>0.826</b>	3.96 (.94)	0.76	.88
9. I know how to go about getting a mammogram	<b>0.703</b>	3.64 (1.19)	0.63	.89
10. I can find a place to have a mammogram	<b>0.700</b>	3.98 (.94)	0.64	.89
Eigenvalue	5.38			
Variance (%)	53.79			
Cronbach $\alpha$	0.90			
Scale mean (SD)	38.15 (7.29)			
Theoretical scale range	10–50			
Actual range	16–50			

<sup>a</sup>Boldface indicates highest factor loadings.

ensure that the characteristics of the data were suitable for the factor analysis. The results showed that the KMO was 0.89, and the result of the BTS was 1164.37 ( $df = 45$ ,  $P = .000$ ). Items loaded on 1 factor for the MSS-T, explaining 53.79% of the total variance. Ten-item loading on the 1 factor ranged from 0.62 to 0.83, representing the actual correlation between each item and the factor scores (Table 2).

#### TURKISH CHAMPION BREAST CANCER FEAR SCALE

A principal component analysis was used to extract factors of the 8-item CBCFS-T. The obtained factors were rotated orthogonally using the varimax procedure with Kaiser normalization. The KMO measure of sampling adequacy and BTS were conducted before factor extraction, and KMO analysis yielded an index of 0.87 and a value of 1156.71 ( $df = 28$ ,  $P = .000$ ) for BTS. A principal component factor analysis yielded 2-factor structure with eigenvalues greater than 1. The range of factor loadings for the CBCFS-T was 0.72 to 0.86, and 2-factor solution accounted for 73.24% of the variance. Five of the fear items related with intrusive thoughts (eg, scared, upset, edgy, uneasy, anxious; FEAR 1, FEAR 3, FEAR 5, FEAR 7, and FEAR 8) loaded on factor 1 and accounted for 60.25% of the variance, and the rest of the fear items that were related with physiological arousal (eg, nervous, depression, heart rate; FEAR 2, FEAR 4, and FEAR 6) loaded on factor 2 and accounted for 12.99% of the variance. Cronbach  $\alpha$  values of factors 1 and 2 were .90 and .83, respectively. The  $\alpha$  value

was .90 when combining factors 1 and 2. There was a positive correlation between component 1 and component 2 ( $r = 0.63$ ), and the item-total correlations were 0.57 to 0.79, providing enough evidence to combine the 2 factors in 1 factor for the fear scale. In addition, a total of 3 items loaded higher than 0.30 on more than 1 factor. These items all loaded on factor 1 with item loadings 0.81, 0.72, and 0.78, and on factor 2, with loadings 0.37, 0.47, and 0.36, respectively. Thus these items were assigned to factor 1 on the basis of higher loading on this factor (Table 3).

#### Testing of Theoretical Relationships

To test for theoretical relationships, bivariate analyses were performed with demographic variables, scale scores, and mammography behavior before entering variables into the logistic regression. Mammography adherence was coded as a binary variable, with 0 reflecting not having a mammogram in previous 2 years (nonadherent) and 1 reflecting having a mammogram in previous 2 years (adherent). Only having health insurance ( $\chi^2 = 4.15$ ,  $df = 1$ ,  $P = .004$ ), having breast cancer information ( $\chi^2 = 25.37$ ,  $df = 1$ ,  $P = .000$ ), having breast problems ( $\chi^2 = 23.87$ ,  $df = 1$ ,  $P = .000$ ), having had CBE ( $\chi^2 = 88.99$ ,  $df = 1$ ,  $P = .000$ ), and receiving physician's recommendation ( $\chi^2 = 84.31$ ,  $df = 1$ ,  $P = .000$ ) were associated with mammography behavior and were entered in the logistic regression. As a result of logistic regression analysis, having a physician referral (odds

**Table 3 • Factor Loadings, Item Analysis, and the Item-Total Correlations for the 8 Items in the Turkish Breast Cancer Fear Scale (N = 224)**

Fear	Factor Loading Factor 1 <sup>a</sup>	Factor Loading Factor 2 <sup>a</sup>	Item Mean (SD)	Corrected Item/Total Correlation	$\alpha$ if Item Deleted
1. When I think about breast cancer, I get scared.	<b>0.804</b>	0.079	3.61 (1.11)	.57	.90
2. When I think about breast cancer, I feel nervous.	0.209	<b>0.786</b>	2.84 (1.17)	.58	.90
3. When I think about breast cancer, I get upset.	<b>0.791</b>	0.288	3.71 (1.05)	.72	.89
4. When I think about breast cancer, I get depressed.	0.291	<b>0.858</b>	2.89 (1.17)	.71	.89
5. When I think about breast cancer, I get edgy.	<b>0.810</b>	0.368	3.60 (1.07)	.79	.88
6. When I think about breast cancer, my heart beats faster.	0.288	<b>0.812</b>	2.92 (1.19)	.66	.89
7. When I think about breast cancer, I feel uneasy.	<b>0.715</b>	0.474	3.42 (1.13)	.78	.88
8. When I think about breast cancer, I feel anxious.	<b>0.783</b>	0.363	3.56 (1.10)	.75	.86
Eigenvalue	4.82	1.04			
Variance (%)	60.25	12.99			
Total variance (%)	73.24				
Cronbach $\alpha$	0.90				
Scale mean (SD)	26.36 (7.29)				
Theoretical scale range	8–40				
Actual range	8–40				

<sup>a</sup>Boldface indicates highest factor loadings.

ratio [OR] = 9.07; 95% confidence interval [CI], 4.01–20.53) and having had CBE (OR = 0.09; 95% CI, 0.04–0.19) were the variables that were identified with significant ORs.

The item and the scale means and SDs of the self-efficacy and fear scales for the Turkish sample were determined. The item mean (SD) score was 3.79 (0.79), and the scale mean (SD) score was 38.15 (7.29) for MSS-T, and for CBCFS-T, it was 3.30 (0.91) and 26.36 (7.29), respectively. To determine if there was a relationship between having a mammogram and the self-efficacy and the fear scales, independent *t* tests were performed. Significant differences between the mammography and no mammography groups were observed for the self-efficacy scale ( $t = 5.85$ ,  $P = .000$ ). Overall, women in the mammogram group had higher scores on the self-efficacy scale. No significant differences emerged between the groups on the fear scale ( $t = 0.541$ ,  $P = .589$ ). Self-efficacy scale was also the only variable that was identified with significant ORs as a result of logistic regression analysis. Women with greater percep-

tions of the mammography self-efficacy were nearly 3 times more likely to have had mammography than women with lower perceptions (OR = 2.96; 95% CI, 1.91–4.59). The remaining variable, breast cancer fear, was not significant predictor for having mammography (OR = 0.88; 95% CI, 0.64–1.21).

## Discussion

In the current study, scales to measure self-efficacy for having mammography and breast cancer fear were tested in Turkish women. The results of the study provided preliminary evidence for the reliability and the validity of MSS-T and CBCFS-T.

The rigorous translation and adaptation process helped establish the cross-cultural equivalence of the instruments in the present study. Reliability was estimated by means of Cronbach  $\alpha$  and test-retest procedures. The Cronbach  $\alpha$  coefficient for MSS-T was .90. It is suggested that a reliability of .70 or higher is acceptable for instruments used in research.<sup>38</sup> Given this rule, the MSS-T exhibited good internal consistency and was sufficiently adequate for administration to Turkish women. In other studies of the MSS that were conducted in the United States, the Cronbach  $\alpha$  coefficients were found as .80, .87, and .88, respectively.<sup>9,12,18</sup> In this study, each item of the MSS-T demonstrated acceptable corrected item-total correlations<sup>35</sup> ranging from 0.54 to 0.76. This finding is consistent with those of studies conducted in the United States as well.<sup>9,18</sup> In the current data, a test-retest score of 0.56 indicates the moderate

**Table 4 • Test-Retest Correlations of Self-Efficacy and Fear Scales (n = 29)**

Variable	Test		Retest		<i>r</i>
	Mean	SD	Mean	SD	
Self-efficacy	9.55	9.10	40.21	6.98	0.563 <sup>a</sup>
Fear	27.14	6.32	27.83	5.70	0.602 <sup>a</sup>

<sup>a</sup> $P < .01$ .



correlation but acceptable score for test-retest reliability for MSS-T. The moderate test-retest reliability may be because of the fact that women were more aware about breast cancer and mammography from filling out the questionnaire the first time.

As for reliability, the CBCFS-T demonstrated satisfactory internal consistency ( $\alpha = .90$ , corrected item-total correlations = 0.57–0.79) and test-retest reliability. Internal consistency was comparable to that observed in the original version ( $\alpha = .91$ , English version)<sup>17</sup> and in other studies with Cronbach  $\alpha$  values of .93, .94, and .93, respectively.<sup>11,12,16</sup> Results of corrected item-total correlations were also generally consistent with those of the original version.<sup>17</sup> Furthermore, test-retest reliability was found to be 0.60 in the present study, and it was 0.70 in the original study.<sup>17</sup>

In this study, validity was examined in 2 ways. First, content validity was assessed by a panel of experts. Second, construct validity was assessed by exploratory factor analysis. A CVI value of 0.96 for MSS-T indicated that the content of the scales was valid. A CVI value of 0.90 as the standard for the establishing excellence in a scale's content validity.<sup>38</sup> The study has employed exploratory factor analysis (principal components analysis) to establish the construct validity of the both scales. As a result of this analysis, the KMO measure produced a coefficient of 0.89, and the result of the BTS of 1164.37 ( $df = 45$ ,  $P = .000$ ) were indicative of excellent sampling adequacy and the sample was suitable for factor analysis. All the items in the self-efficacy scale clustered together into 1 dimension in a similar way to the original (English) version<sup>18</sup> and met the loading criterion (as the correlations should be greater than 0.30).<sup>37</sup> These results were suggestive of strong validity of items in MSS-T scale.

Related with CBCFS-T, the CVI of 100 indicated that the content of the scale was valid. The factor analysis of the CBCFS-T had a KMO measure of sampling adequacy of 0.87, in concert with a highly significant BTS ( $\chi^2 = 1156.71$ ,  $df = 28$ ,  $P = .000$ ), again indicating that the data were suitable for factor analysis. In this study, items in the fear scale loaded on 2 factors greater than 0.30. Items related with the feelings of being scared, upset, edgy, uneasy, and anxious collapsed in 1 factor, and items related with the feelings of being nervous and depressed and having the heart beat faster collapsed in another factor. However, they were treated as 1 dimension because the 2 clustered groups were moderately correlated. It may be postulated that the belief associated with the breast cancer fear of Turkish women may differ from those of American women and the division of items in fear scales warrants further investigation.

In the present study, the descriptive results showed that women have a high to neutral sense of self-efficacy for mammography. Women's level of self-efficacy was found similar with the original study.<sup>18</sup> These findings can be interpreted as, in general, most of the participants might have received a mammogram at some time in the past and were confident in the ability to be able to get a mammogram. However, in the present study, the mammography rate was found low (44%). In the study, bivariate analyses of self-efficacy and mammography behavior indicated significant differences between the mammography and no mammography groups, and women with greater

perceptions of the mammography self-efficacy were nearly 3 times more likely to have had mammography than women with lower perceptions. This is consistent with theoretical predictions that self-efficacy should predict mammography adherence.

The association between the breast cancer fear and mammography use was found in several studies.<sup>31–33</sup> In the current study, inconsistent with theoretical assumptions, the fear of breast cancer did not predict mammography behavior and a high level of fear towards breast cancer was found among the sample. This is not consistent with the original scale where African American and white women scored their levels of breast cancer fear at the moderate level (a score of 16–23).<sup>17</sup> This result shows that Turkish women are highly afraid of breast cancer and the need to determine strategies that would depress the level of fear among Turkish women. Furthermore, educational health promotion programs that are sensitive to the Turkish women's health beliefs toward breast cancer should be implemented to minimize women's overall breast cancer fear. In a study with Turkish women,<sup>39</sup> it was reported that half of the sample have fears of breast cancer diagnosis and have been suggested that the screening behaviors of these women may be strongly inhibited by high fear levels. In the present study, women in both adherent and nonadherent groups reported statistically nonsignificant high levels of breast cancer fear. The finding of high level of fear in adherent group does not fit with breast cancer fear theory. On the other hand, a possible explanation of the insignificant association between the construct of fear and mammography behavior might be explained by the negative outcomes of breast cancer. In Turkey, breast cancer tends to be diagnosed at later stages. Thus, women in both mammography-adherent and nonadherent groups might have more exposure to the negative effects of breast cancer in general. But this finding needs further investigation. The best way to test the relationship between fear and mammography adherence should be provided by experimental studies. In experimental studies, women could be randomly assigned to low, moderate, and high cancer fear groups and could examine the mammography rates. Further investigation that evaluates the usefulness of the fear scale for better understanding the Turkish women's breast cancer fear and mammography is needed.

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## ■ Conclusions

The MSS-T and the CBCFS-T were estimated to be reliable and valid tools for use in Turkish women. The use of the MSS-T and the CBCFS-T is important in understanding the Turkish women's beliefs and how they affect their mammography behavior. The tools can offer insights to nurses and other health-care professionals about mammography self-efficacy and breast cancer fear beliefs of Turkish women. Mammography self-efficacy beliefs can be heightened, and fear beliefs can be lowered or modified once they are identified. Both scales may further serve as tools for assessing the efficacy of interventions designed to alter self-efficacy and fear and subsequently improve the mammography adherence rates. Besides, the uses of these tools offer the advantage of comparisons of self-efficacy and fear beliefs of



women between the studies in different countries. As these are preliminary findings for Turkish self-efficacy and the fear scales, further testings are recommended with women living in different regions of Turkey. And especially, the relationship between fear and mammography behavior should be explored further.

## Limitations

The sample does not represent all women in Turkey; therefore, no generalization could be made. Both scales can reliably and validly be used in settings where women with similar characteristics in this study. The study has limited comparisons because of the lack of relevant literature on similar studies in Turkey. Self-efficacy and mammography adherence were collected at the same time; thus, it cannot be assumed that the self-efficacy belief preceded mammography adherence in the study.

## ACKNOWLEDGMENTS

The author would like to thank Victoria L. Champion, DNS, RN, FAAN, for giving permission to use and adapt the scales; Nursen O. Nahcivan, PhD, for her support and guidance; Hulya Tekin and Kirstin Ozturk for their support; and the women who generously participated in the study.

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