

## RESEARCH COMMUNICATION

## Mammography Utilization among Turkish Women

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## Abstract

In Turkey, breast cancer is the leading type of cancer and cause of cancer-related deaths among women, but information is limited on mammography practices. The objectives of the present study were to identify associations between attitudes and knowledge about mammography and socio-demographic indicators and having a mammogram. The participants of this cross-sectional and descriptive study were 1,208 women who attended the primary health care unit serving as a training unit of the medical faculty or the outpatient clinic for breast diseases of the same medical faculty's hospital between October and December 2007. A printed questionnaire covering socio-demographic variables, family history of breast cancer, mammography practices, and attitudes and knowledge of mammography was filled out in face-to-face interviews with the authors. Women with previously diagnosed breast cancer were excluded from the study. We performed chi square and logistic regression analyses. We found that 12.7% of the women had no knowledge of mammography, and 57.3% had never had a mammogram. Fifty point six percent of our study group reported that they had had a clinical breast examination at least once, and 51.1% were aware of breast self examination (BSE). Need factors such as age and health-system-related factors such as awareness of BSE and having CBE were found to be more important than the socio-economic factors in mammography use. Mammography was accepted by 92.3% as a useful screening method for early detection of breast cancer and as a necessity for women of 50 years and over by the 90.6% of the study group. We found a positive attitude towards mammography and its importance but limited usage.

**Keywords :** Mammography - breast cancer screening - Turkey - self report

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## Introduction

Breast cancer is responsible for the largest proportion of female deaths from any form of cancer in Turkey (IARC, 2002) and has accounted for approximately 16.7% of all cancer-related deaths in recent years (MOH, 1999; IARC, 2002). Breast cancer is responsible for the largest proportion of new cancers that are reported (MOH, 1999; IARC, 2002), making up 24.2% of female cancers in 2002 (IARC, 2002). The incidence rate of breast cancer among women was found to be 7.32 per 100,000 in the year 1999 (MOH, 1999).

Population-based studies have shown that mammography can be effective in early detection and can reduce breast cancer mortality (McCarthy et al., 2000; Nystrom, 2000; Woolf, 2001). According to the Cochrane Review, mammography screening for breast cancer likely reduces breast cancer mortality, but the magnitude of the effect is uncertain, and the estimated relative risk reduction in breast cancer mortality is 15% (Gøtzsche and Nielsen, 2006).

The American Cancer Society (ACS) recommends

clinical breast examination and mammography for the early detection of breast cancer (Smith et al., 2003). According to ACS recommendations, women should know how their breasts normally feel and report any breast changes promptly to their health care providers, and breast self-examination (BSE) is an option for women starting from the early 20s (ACS, 2007). However, the Cochrane Review does not suggest a beneficial effect of screening by BSE (Kösters et al., 2003). The ACS recommends clinical breast exams as a part of periodic health exams, preferably every 3 years for women between 20 and 39 and preferably every year for women over 40 years of age. Mammograms are recommended yearly for women over 40 years of age and continuing for as long as a woman is in good health (ACS, 2007).

Mammography screening for diagnostic and screening purposes is paid by government-funded health insurance schemes and is free of charge in Turkey. However, studies have showed that breast cancer screening practices are underused among Turkish women. Only 27% to 39% had ever performed BSE (Secginli and Nahcivan, 2004), 23.4% had no knowledge about breast cancer, 27.9% had

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no concept of BSE, 89.3% had never had a mammogram, and 75.0% had never had a clinical breast examination (Dundar et al., 2006).

In this study, we wanted to evaluate the associations between attitudes and knowledge about mammography and socio-demographic indicators and the mammography practices of Turkish women in an urban setting.

## Materials and Methods

### *Study Participants and Data Collection*

In this cross-sectional study, the data were collected from women aged between 20 and 90 years, living in Bursa with a population of over 2,000,000 located in the north-western region of Turkey. Participants were recruited among women who were attending the primary health care unit and the outpatient clinic for breast diseases of the training hospital of the medical school which is located in the corresponding city. The primary health care unit is a training center for medical students and also serves a population of 10,000 as a first referral center. This unit is located outside of the training hospital and is affiliated to the department of family medicine of the medical faculty. Approval for this study was given by the ethics committee of the corresponding medical faculty. During the study period, a total of 1401 women attended whether the primary health care unit or the breast diseases outpatient clinic (primary health care unit= 893; breast clinic= 508). Among those who attended the breast clinic 27 had previously diagnosed breast cancer and were excluded from the study. A total of 166 women (primary health care unit= 98, breast clinic= 68) did not want to participate into the study. Our study group was consisted of 1208 women who gave their written consent for participation. Questionnaires were filled out in face-to-face interviews conducted by the authors. The participation rate was found to be 87.9 % (primary health care unit= 89.0 %; breast clinic 85.9 %)

### *Study Variables*

The dependent variable, mammography use, was defined in two categories: (0) Not user (had never one), (1) user (had at least one mammogram)

The study variables were selected to focus on (1) socio-economic status, such as income, education, and marital status; (2) need factors, such as age, family history of breast cancer, breast problems; and (3) health-system-related factors, such as having clinical breast examination and awareness of breast self-examination.

### *Analysis*

Statistical analyses were performed by the SPSS V 11.5 package program. A univariate examination of the relationship between the study variables and mammography use was performed by chi-square analysis. To assess the joint effects of the variables, a bivariate regression model was performed with a correct classification ratio of 80.8% and model fitting -2 log likelihood significance of 0.0001.

Some opinions of women regarding mammography were asked by three questions: (1) It is not possible

to take a mammogram without any complaints, (2) Mammography is useful for early detection of breast cancer, and (3) Every woman over 50 should have a mammogram. Their opinions were classified from "strongly agree" to "strongly disagree," and the results are shown as a frequency distribution.

## Results

The women's mean (SEM) age was 48.5 (0.4). Most (92.7%) were currently married. Regarding to their educational attainment, 10.0% were illiterate, 52.1% were primary school, 21.7% high school, and 16.2% university graduates. Most (61.9%) were housewives. Sixty-six point three percent of the study group had an annual family income below US\$ 7,200. The mean (SEM) number for given births was 2.4 (0.05). Only 10.0% of the women reported that they had never breastfed their children, and 67.9% mentioned exclusive breastfeeding practices. Fifty-five point nine percent of the women reported that they were in menopause. Among them, 15.5% mentioned a prescribed hormone replacement therapy, and 13.5 % were currently users. A family history of breast cancer among first-degree relatives was found among 9.6% of the women. Thirty-eight percent of the women pointed to breast problems sometime during their entire lifespan. Only 50.6% of the study group reported that they had had a clinical breast examination at least once, and 51.1% were aware of BSE and had been taught how to perform it. Among the respondents, 16.1% had had one, 26.6% had had more than one, and 57.3% had never a mammogram. Among women who had ever had a mammogram, 18.5% said that "nobody had suggested me to take a mammogram, I decided by myself," 76.4% said that "the doctor had suggested," 0.8% said that "the nurse had suggested," and 4.3% said that "friends and relatives had suggested." Women who reported that they had never had a mammogram (N=692) were asked for the reason, and their answers were as follows: had never heard about mammography (N=88; 12.7%), had heard about mammography but unaware of the necessity (N= 34; 4.9%), was not suggested by the doctor (N=104; 15.0%), was afraid of (N=38; 5.5%), all other reasons (N=82; 11.9%), and no reason (N=346; 50.0%). Only 6.9% of women had not a mammogram in spite of the doctor's suggestion. Those women mentioned their reasons as follows: fear (37.4%), not able to afford (7.5%), believed it was not necessary (26.2%), couldn't find a place to take a mammogram (11.2%), and other reasons (17.7%).

### *Relationship of study variables to mammography use*

Table 1 shows the results of the chi square analyses of the relationship between the study variables and mammography use.

### *Socio-economic variables*

Women in the lower income group were more likely to have never had a mammogram, whereas women in the higher income group were more likely to be users. Women who were university graduates were most likely to report the highest use of mammography. Married women

**Table 1. Some Characteristics of the Study Group and Mammography Usage**

	N	Not user N (%)	User N (%)	$\chi^2$ p value
Age				
< 45	443	309 (69.8)	134 (30.2)	44.433
≥ 45	765	383 (50.1)	382 (49.9)	0.0001
Education				
Illiterate	121	90 (74.4)	31 (25.6)	
Primary	629	401 (63.8)	228 (36.2)	78.114
High school	262	138 (52.7)	124 (47.3)	0.0001
University	196	63 (32.1)	133 (67.9)	
Annual income				
< 7,200 \$	801	539 (67.3)	262 (32.7)	97.278
≥ 7,200 \$	407	153 (37.6)	254 (62.4)	0.0001
Marital status				
Single	96	67 (69.8)	29 (30.2)	6.667
Married	1112	625 (56.2)	487 (43.8)	0.01
Family history				
Yes	116	33 (28.4)	83 (71.6)	43.608
No	1092	659 (60.3)	433 (39.7)	0.0001
CBE				
Yes	611	135 (22.1)	476 (77.9)	625.672
No	597	557 (93.3)	40 (6.7)	0.0001

used mammography more than single women. Education income level and marital status were significantly related to use.

#### Need variables

Women with a family history of breast cancer were significantly more likely to have had mammography. Women with breast problems were significantly more likely to be users. Women younger than 45 years of age were more likely to have never had a mammogram, and women 45 years of age and older were more likely to be users.

#### Factors related to the health care system

Women who had had never a clinical breast examination and who were not aware of breast self-examination were more likely to have never had a mammogram, and women who had had at least one clinical breast examination and were aware of breast self-examination were significantly more likely to be users.

#### Bivariate logistic regression analysis

Regression analysis was used to investigate the relationship of specific variables to use while controlling for the effects of others. Table 2 shows the joint effects of the study variables on a bivariate regression model.

Odds ratios are given that compare the referent group, women who had never had a mammogram, and women who had at least one mammogram. Among socio-economic variables age and income were found to be significant factors related to the use of mammography whereas marital status and education were not found to be significant. Women with 45 years of age and older were 4.2 times more users than those of younger women. Women with an annual income of 7,200 \$ and more were 1.6 times more users than those of with a lesser income. Family history of breast cancer and having breast problems

**Table 2. Bivariate Logistic Regression Analysis of Mammography Usage (Dependent Variable Mammography Usage: Not user=0, user=1)**

Variables	Frequency (%) Study Users group (N=516) (N=1208)	P value ratio	Odds	95% CI
Age				
<45	36.7	26.0	Reference	
≥45	63.3	74.0	0.0001	4.259 2.861-6.339
Annual Income				
<7,200 \$	66.3	50.8	Reference	
≥7,200 \$	33.7	49.2	0.032	1.596 1.041-2.446
Marital status				
Single	7.9	5.6	Reference	
Married	92.1	94.4	N.S.	
Education				
Illiterate	10.0	6.0		
Primary	52.1	44.2	N.S.	
High school	21.7	24.0		
University	16.2	25.8		
Breast problems				
Yes	38.0	62.0	N.S.	
No	62.0	38.0	Reference	
CBE				
Yes	50.6	92.2	0.0001	28.097 17.428-45.298
No	49.4	7.8	Reference	
Awareness of BSE				
Yes	51.1	77.3	0.002	1.889 1.270-2.809
No	48.9	22.7	Reference	
Family history				
Yes	9.6	16.1	N.S.	
No	90.4	83.9	Reference	
Health care unit				
Primary	65.8	40.5	Reference	
Hospital	34.2	59.5	0.0001	3.035 2.007-4.592

were not found to be related to the use of mammography. Women who had had at least one CBE were 28 times more and women with an awareness of BSE were 1.8 times more users of mammography. Women who attended the outpatient clinic of the hospital were 3 times more users of mammography than those who attended the primary health care unit.

We asked the women their opinions regarding mammography. Twenty-five point three percent reported that having a mammogram was not necessary without any breast complaints. Ninety-two point three percent believed that mammography is a useful tool for the early detection of breast cancer, and 90.6% pointed out that every woman over 50 should have a mammogram.

## Discussion

We found that 12.7% of the women had no knowledge of mammography, and 57.3% had never had a mammogram. Fifty point six percent of our study group reported that they had had clinical breast examination at least once, and 51.1% were aware of BSE. A previous study in a rural area of Turkey found that 27.9% of women had had no knowledge of mammography, and 94.9% had never had a mammogram; furthermore, 10.2% of those women were aware of BSE, and 3.3% reported CBE (Dundar et

al., 2006). Differences between those two studies could be due to the urban-rural settlement and the educational differences in the women who participated in these studies.

Regression analysis showed that women 45 years of age and older, with higher income level, having at least once CBE, aware of BSE, and attended to the hospital were more likely to be users. A study among women with a strong family history of breast cancer found that being older than the age of 50 was associated significantly with mammography adherence and pointed out the importance of need factors in the use of mammography (Halbert et al., 2006). Another study among women with no prior mammography experience showed that as women get older they are less likely to intend to get a mammogram and found self-efficacy to be the most significant determinant of initial screening mammography followed by normative beliefs associated with the physician, family, and close friends and perceived behavioral control beliefs related to barriers to obtaining a mammogram (Tolma et al., 2003). However, another study found the overall proportion of young women who annually used mammography to be substantially lower than the women aged 50-74 years (Gilliland et al., 2000). In the USA, mammography use was most prevalent among women 50-59 years of age, and then decreased inversely with age (CDC, 1990). In Canada, lower rates of mammography use were found among women aged 40-49 and those 70 or older compared to aged 50-69 (Maxwell et al., 2001).

Zapka et al. (1992) found two economic factors to be statistically significant in the use of mammography. They were women's educational attainment and income. Women with more than a high school education were more than twice as likely to be repeat recent users, and a US\$5000 increase in income increased the likelihood that a woman would be a repeat recent user. Our study supports previous reports (Katz et al., 2000; Snider et al., 1996; Rosenberg et al., 2005) of strong associations between socio-economic status indicators and mammography use. With respect to need factors, Zapka and colleagues (1992) found that women with a family history of breast cancer were twice as likely as other women to be repeat recent users and those with a history of breast problems were more than 8 times as likely to be repeat recent users. We found no statistically significant relationships between history of breast problems or family history of breast cancer and use of mammography. A study from Australia showed that women who were widowed, separated, or divorced were significantly more likely than those in a married or de facto relationship to have never had a mammogram (Achat, 2005). We found no significant relationship between marital status of women and mammography use. In the same Australian study, doctor recommendation and perceived breast problems were found to be important factors in mammography use and never having a clinical breast examination was significantly associated with never having had a mammogram. We also found that having a clinical breast examination was strongly associated with the use of mammography.

A previous study found that the belief that an absence of symptoms meant there was no need for a breast examination, fear about x-rays and test results were

major barriers against mammography (Kang et al., 2008). In our study 25.3% of participants reported that having a mammogram was not necessary without any breast complaints and 5.5% of not users said that they were feared of having a mammogram.

A previous study about knowledge and attitudes of BSE and mammography among Turkish women who were living in a rural area revealed that the level of breast cancer knowledge was the only variable significantly associated with BSE and mammography practice (Dundar et al., 2006). This finding is related to our study, which found awareness of BSE and having CBE as important factors of practicing mammography. According to a recent literature review on factors associated with mammography utilization CBE was found strongly correlated with the use of mammography (Schueler et al., 2008).

Knowledge and use of mammography are at a lower level among Turkish women. In addition to need factors such as age of women, factors related to the health system such as being aware of BSE and having CBE are important factors in practicing mammography. Women who attended to the primary health care unit used mammography lesser than women who attended the hospital. Therefore health education and health promotion throughout the primary health care system to increase the use of mammography are strongly needed. Despite of the recommendations of the Cochrane Review not to recommend BSE, BSE should be further recommended for the Turkish women; hence, it has an impact on mammography use and screening for breast cancer with mammography reducing breast cancer mortality. According to the Cochrane Review, the absolute risk reduction is estimated as 0.05%; this means that for every 2,000 women invited for screening over 10 years, one will have her life prolonged. On the other hand, screening also leads to overdiagnosis and overtreatment with an estimated absolute risk increase of 0.5%, which means that for every 2,000 women invited for screening over 10 years 10 healthy women who would not have been diagnosed if there had not been screening will be diagnosed as breast cancer patients and will be treated unnecessarily. Therefore, today it is not clear whether screening does more good than harm, and women recommended to have mammography screening should be fully informed of both the benefits and disadvantages.

Early diagnosis in breast cancer save lives, and this fact makes mammography important. Hence, today we have no other tool for breast cancer screening, and since breast cancer mortality ranks first among cancer-caused deaths among women, we should use mammography and do our best to provide the highest use.

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**References**

- Achat H, Close G, Taylor R (2005). Who has regular mammograms? Effects of knowledge, beliefs, socioeconomic status and health related factors. *Prev Med*, **41**, 312-20.
- ACS (American Cancer Society) (2007). Chronological history of ACS recommendations on early detection of cancer. Available at: <http://www.cancer.org>. Retrieved on 19 April 2007.
- CDC (Centers for Disease Control and Prevention) (1990). Use of mammography- United States, 1990. *MMWR*, **39**, 627-30.
- Dundar PE, Ozmen DS, Ozturk B, et al (2006). The knowledge and attitudes of breast self examination and mammography in a group of women in a rural area in western Turkey. *BMC Cancer*, **6**, 43-54.
- Gilliland FD, Rosenberg RD, Hunt W, et al (2000). Patterns of mammography use among Hispanic, American Indian and Non-Hispanic white women in New Mexico, 1994-1997. *Am J Epidemiol*, **152**, 432-7.
- Gótzsche PC, Nielsen M (2006). Screening for breast cancer with mammography. Cochrane Database of Systematic Reviews, Issue 4. Art. No. CD001877. Available at: DOI:10.1002/14651858.CD001877.pub2. Retrieved on 19 April 2007.
- Halbert CH, Kessler L, Wileyto EP, et al (2006). Breast cancer screening behaviors among African American women with a strong family history of breast cancer. *Prev Med*, **43**, 385-8.
- IARC (International Agency for Research on Cancer) (2002). Cancer incidence in five continents. Available at: <http://www-dep.iarc.fr/>. Retrieved on 25 March 2007.
- Kang HS, Thomas E, Kwon BE, et al (2008). Stages of change: Korean women's attitudes and barriers toward mammography screening. *Health Care Women Int*, **29**, 151-64.
- Katz SJ, Hofer TP (2000). Breast cancer screening in the United States and Canada, 1994: socio-economic gradients persist. *Am J Public Health*, **90**, 799-803.
- Kösters JP, Gótzsche PC (2003). Regular self-examination or clinical examination for early detection of breast cancer. Cochrane Database of Systematic Reviews. Issue 2. Art. No.: CD003373. Available at: DOI: 10.1002/14651858.CD003373. Retrieved on 19 April 2007.
- Maxwell CJ, Bancej CM, Snider J (2001). Predictors of mammography use among Canadian women aged 50-69: findings from the 1996/97 national population health survey. *CMAJ*, **164**, 329-34.
- McCarthy E, Burns R, Freund K, et al (2000). Mammography use, breast cancer stage at diagnosis and survival among older women. *J Am Geriatr Soc*, **48**, 1126-33.
- MOH (Ministry of Health of Turkey) (1999). The most frequent cancers in females in Turkey, 1999. Available at: <http://www.saglik.gov.tr>. Retrieved on 29 March 2007.
- Nystrom L, Rutqvist LE, Wall S, et al (1993). Breast cancer screening with mammography: overview of Swedish randomized trials. *Lancet*, **341**, 973-8.
- Rosenberg L, Wise LA, Palmer JR, et al (2005). A multilevel study of socioeconomic predictors of regular mammography use among African-American women. *Cancer Epidemiol Biomark Prev*, **14**, 2628-33.
- Schueler K M, Philip W C, Smith- Bindman R (2008). Factors associated with mammography utilization a systematic quantitative review of the literature. *Journal of Womens Health*, **17**, 1477-98.
- Secginli S, Nahcivan NO (2004). Reliability and validity of the breast cancer screening belief scale among Turkish women. *Cancer Nurs*, **27**, 287-94.
- Smith RA, Saslow D, Sawyer KA, et al (2003). American cancer society guidelines for breast cancer screening update. *Cancer*
- Woolf S (2001). The accuracy and effectiveness of routine population screening with mammography, prostate specific antigen, and prenatal ultrasound: a review of published scientific evidence. *Int J Technol Assess Hlth Care*, **17**, 275-304.
- Zapka JG, Hosmer D, Costanza ME, et al (1992). Changes in mammography use: economic, need and service factors. *Am J Pub Hlth*, **82**, 1345-51.