RESEARCH COMMUNICATION

Risk of Breast Cancer, Health Beliefs and Screening Behaviour among Turkish Academic Women and Housewives

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Abstract

Background: Breast cancer (BC) is one of the most common forms of epithelial neoplasms type of cancer affecting women worldwide. The main objective of this study was to examine health beliefs, screening behavior and risk for developing BC in academic women and housewives in Turkey. Methods: In this cross-sectional, descriptive study, a sample of 415 women were surveyed, composed of 166 academics and 249 housewives between the ages of 20-65 years. Results: Risk of developing breast cancer, both five-year and lifetime, was higher in academic women than in housewives (P <0.001). The frequency of BSE, CBE and mammography was higher in academic women than housewives. For academic women, perceptions related to benefit, self-efficacy, health motivation were significantly higher than housewives (t= 3.726, P <0.001; t=8.165, P <0.001, t=2.326; P <0.021, respectively). Conclusion: The findings of this study indicate that the risk for developing BC in academic women is higher than for housewives. Although academic women had more screening performance for early diagnosis of BC, it was still lower than 50%, below the desired level. Education programs should be aimed at increasing women's BC screening behaviors and the positively affect beliefs.

Keywords: Breast cancer - risk assessment - Gail model - screening methods - Turkish academics/housewives

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Introduction

Breast cancer (BC), is one of the most common forms of epithelial neoplasms, a type of cancer affecting in women worldwide. Özmen (2011) reported that although global BC incidence rates have increased by approximately 0.5% annually since 1990, BC rates in Turkey, Japan, Singapore, and Korea have doubled or tripled in the past 40 years. According to the most recent reports of the Turkish Cancer Registry, BC is currently the most commonly occurring female cancer in Turkey with an incidence of 35,5 cases per 100,000 of all cancers diagnosed in women (Ministry of Health of Turkey, 2005). In Turkey, previous studies on BC (Oran et al., 2004; Özmen, 2006 ; Beji and Reis, 2007) have suggested that BC cases have increased due to the change in lifestyle (such as delay age at first birth, nulliparity, use of hormone therapy, no breast-feeding) among women. Education have been linked with BC risk due to the change in lifestyle. Furthermore, in recent years, studies have found that higher educational level is associated with increased risk of BC in women (Strand et al., 2005; Menvielle et al., 2006; Naieni et al., 2007). It was reported in two previous studies that the risk of BC was higher in academic women than other women (Danø et al., 2003; 2004). Also known as, estimating BC risk for individual women is complicated. Because most BC is not attributable to risk factors other than female gender and increased age. For women aged 35 and older, a risk assessment tool is available to identify those who are at increased risk for developing BC (Bevers et al., 2009). Over the past two decades, a number of statistical models have been designed and validated to assess BC risk in both populations and individuals. The most widely known and most commonly used model for BC risk assessment is the Gail model (GM) (Gail et al., 1989). In general, the majority of BC occurs in a sporadic form without hereditary predisposition, therefore, the GM is more appropriate for women at risk for sporadic BC (Park et al., 2010). The model calculates projected five-year and lifetime probabilities of developing invasive BC and can be used to identify women who have an increased risk for developing BC. According to the modified GM, increased risk for women aged 35 years or older is defined as a five-year risk of 1.7% or greater. The modified GM risk assessment tool also provides an estimate of a woman's lifetime risk for developing breast cancer. This estimate for lifetime risk is based on the GM risk criteria, which differs from other risk assessment models predominantly based on family history and is not used to determine whether a woman is at increased risk for developing BC (Bevers et al., 2009). Lifetime risk for developing BC was categorized as usual (<15%), moderate (15-30%) or strong (>30%).

Screening for BC is performed in women without any

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signs or symptoms of BC so that disease can be detected as early as possible (Bevers et al., 2009). Recommended methods to detect early BC in women include breast self-examination (BSE), clinical breast examiniation (CBE) and mammography (Smith et al., 2005).

In women aged 35 years or older with a five-year risk of 1.7% or greater, the recommendations are for CBE every 6 to 12 months, annual mammograms and breast awareness with regular BSE is encouraged. For women with a lifetime risk greater than 20% (based on models largely dependent on family history), the recommendations are for CBEs every 6 to 12 months, annual mammograms and breast awareness is encouraged (Bevers et al., 2009).

Currently in Turkey, mammography and CBE are not part of routine screening procedures for BC and they are only recommended for women who have increased risk for developing BC. BSE as a screening method is controversial BSE has been reported that women who perform BSEs are more "breast aware" (Avcı and Gözüm, 2009). Women who are more "breast aware" may improve their chances of earlier diagnosis of BC. Furthermore, unlike mammography and CBEs that require health professionals, BSE is simple, inexpensive and does not require technology. BSE can be taught to both health professionals and women, and more importantly raises awareness about BC in women. It is argued that in many countries, especially in developing countries, BSE may be the only realistic approach to achieve early detection of BC (Montazeri et al., 2008).

The Health Belief Model (HBM) is a model used to examine underlying personal beliefs about screening behaviors for the early detection of BC (Champion, 1993). Previous studies performed in Turkey found that there is a low rate of BC screening behaviors (BSE, CBE or mammography) in women (Canbulat and Uzun, 2008; Ceber et al., 2009; Ekici and Utkualp, 2007; Nur, 2010; Yavan et al., 2010) when compared to those in Western countries (Wu et al., 2006). Sociocultural, educational, and economic constraints are barriers to BC detection that need to be overcome for women in Turkey. Health protective behaviors, such as completing screening exams, are related to individual perceptions of the risk involved with the test, benefits of the exam and barriers that impact one's decision to get screeening. Other factors include personal and social influences, as well as attitude (Bener et al., 2009). A study by Champion (1999) stressed that an individual's health beliefs play a role in their interest in health protective behaviors, which in turn leads to action. According to the results of previous studies done in Turkey, health beliefs are the most important category of factors that affect BC screening in women. Although these studies evaluated health beliefs relevant to BC screening behaviors in various groups of women, there have been no studies that examined health beliefs together with screening behaviors and risk of BC among academic women and housewives in Turkey.

Therefore, the specific aims of this study were to (1) examine the projected risk of BC (2) determine the levels of breast screening behaviors including BSE, CBE and mammograhy (3) determine the relationship between health beliefs and screening behaviors in academic women and housewives in Turkey. Determining the health beliefs and screening behaviors of these women as well as defining their risks for developing BC may increase awareness and understanding about the disease and precautions. Data from this study may shed light on how to improve the effectiveness of health education for individuals. Most importantly, it may help to save lives by identifying those women at increased risk for developing BC and improving overall screening performances

Materials and Methods

Design and sample

This study is a cross-sectional, descriptive design. This study was held at a University where academic women of all departments were included and at Primary Health Care Center (PHCC) area of education in the university. Academic women working at a University, housewives living in the district of PHCC and housewives visiting the center for healthcare services (including immunizations, family planning services, health monitoring, seeking treatments, etc.) during the selected time period constituted the study participants. Written permission was obtained from both the administration of University and the City Directorate of Health in order to conduct this study. The purpose of the study was explained to each woman and voluntary consent was obtained from all of them prior to participation. Women who refused to participate in the study and those women who were not present in the study place during the cited time period above (March 16 and April 17, 2010) were excluded.

A total of 415 women, consisting 166 academic women and 249 housewives, who had not been previously diagnosed with BC and were between the ages of 20 and 65 years, were included in the study.

Instruments

Three tools were used for data collection in this study: 1) A demographic data questionnaire created for this study obtained information about the participants' socio-demographic characteristics (age, current marital status, years of education), and other factors related to BC (ages of menarche and first childbirth, regular monthly BSE performance, received or going for CBE, frequency of mammography and age at the first mammography, and having a family history of BC); 2) Champion's Health Belief Model Scale (CHBMS), has been adapted for use internationally and has been widely used to determine health beliefs related to breast cancer screening behaviors in different populations. The CHBMS incorporates the six basic concepts contained in the HBM, namely, susceptibility, seriousness, general health motivation, benefits, barriers and self-efficacy in oneself as they relate to BC, BSE mammography (Champion, 1993). In this study, the version of CHBMS used was adapted into Turkish by Karayurt (2003); 3) Projected BC risk (calculated risk) was determined using the modified GM. The risk for developing BC was calculated by a computer program, a tool provided by National Cancer Inst itute, version 7 (Gail et al., 1989). According to the modified GM, prescribed risk factors, lifetime and five-years BC

Table 1. Calculated Breast Cancer Risk in Academic Women and Housewives, 35 Years and Over (N=226)

Risk		Academics (n=84)		Housewives (n=142)			
		n %	Mean±SD	n %	Mean±SD	Test	P-value
Five-years	>1.7 (High risk)	7 (8.3)	2.07±0.27	7 (4.7)	1.93±0.43	Z= -1.429	0.153
Lifetime	<5 (Usual)	67 (79.8)	10.8±1.91	134 (94.4)	7.9±2.02	t= 9.894	<0.000
	15-30 (Moderate)	16 (19.0)	19.7±3.00	8 (5.6)	18.8±2.40	Z= -1.133	0.257
	>30 (High)	1 (0.2)	32.3	0 (0.0)	0		

risk was calculated for participants 35 years and over.

Data Collection

Data collection occurred between March 16 and April 17, 2010 concurrently at each of the study sites. The data collection forms were filled out by the researchers during face to face interviews with the women. The researchers interviewed with each academic women in their room at the university and with each of the housewives separately in a room of the PHCC. Each interview took about 15-20 minutes.

Calculation of BC Risk

BC risk was calculated using the National Cancer Institute's on-line version of the GM (Available at http://bcra.nci.nih.gov/brc/). This risk assessment program calculates five-year and lifetime BC risk based on current age, age at menarche, age at first live birth, number of first degree relatives with breast cancer, number of previous biopsies with/without atypical hyperplasia, and race (Gail et al., 1989). Lifetime risks were categorized as usual (<15%), moderate (15–30%), or strong (>30%) (Quillin, et al., 2005). For five-year risk assessment, a score of 1.7% or less was defined as low risk while a score of 1.7% or greater was definted as high risk (Bevers et al., 2009; Ulusoy et al., 2010).

Statistical Analyses

The data was analyzed by the SPSS version 14.0 for Windows. Descriptive statistics calculated included the mean, median, standard deviation (SD), frequency distributions and percentages. Internal consistency was calculated by Cronbach's alpha reliability analysis. The data was also evaluated using the chi-squared and t-tests. Two-tailed P-values less than $< .05$ for appropriate tests were considered statistically significant.

Results

The average age of academic women was 35.4 years (range, 22-63 years) and most had either a masters or doctorate degree, bachelor degree (34.3%, 58.4% and 7.3%.respectively). Of all academic women, 69.9% of them were married. The average age for their first menarche was 13.3 years. Approximately 56% of them stated that they had previously given birth. The average age of their first live birth was 27.6 years. The average age of the housewife was 36.4 years (range, 20-65 years). Of the housewives, 68.7% of them had completed elementary school, 16.1% did not complete elementary school and reported they could not read & write. Most of the housewives (91.2%) were married. The average age for their first menarche was 13.1 years. A large percentage of the housewives (90%) indicated that they had given birth and the average age of their first live birth was 19.9 years.

Several women pointed out that they had at least one first degree relative who diagnosed with breast cancer, 13.3% of academic women and 6.8% of housewives. Approximately 6% of academic women and 2.8% of housewives reported previous breast biopsy. Of those women who had undergone breast biopsy, 30% of academic women and 14.3% of housewives were diagnosed with atypical hyperplasia.

The distribution of BC risks of academic women and housewifes, calculated for five-years and lifetime using the Gail Model (see Table 1). Increased BC risk was found in 2.07% of academic women and 1.93% of housewifes, five years risk (had a five-year BC risk over 1.7%; Z= -1.429; p-value 0.153). Lifetime risk among academic women showed the following results: usual 79.8% (10.8), moderate 19.0% (19.7), and strong 0.2% (32.3). Lifetime BC risk among housewifes was distributed as usual 94.4% (7.9), moderate 5.6% (18.8) and there were no individuals who had a strong risk. A significant difference was noted for usual(t= 9.894; p-value <0.001) but not moderate (Z= -1.133; 0.257).

Regarding BC screening behavior, based on self-reported data 36.1% of academic women perform edmonthly BSE, 33.7% of them also have CBEs, and 17.5% have annual mammograms while 16.1% of housewives had monthly BSE, 24.1% get CBEs and 16.5% have annual mammograms. The mean age of women who had yearly mammograms was 40.8 years and 36.4 years in academic women and housewives, respectively. The frequency of BSE and CBE was higher in academic women than housewives and was found to be significantly higher ($P < 0.01$). The number of academic women of getting annual mammograms was also higher than the housewives but without significance ($P > 0.791$).

Table 2 shows the health beliefs of academic women and housewives and their screening behaviors to obtain early diagnosis of BC. For academic women, perceptions of screening tests related to benefit, self-efficacy, health motivation in the subscales of the CHBMS were

Table 2. Comparison of Health Beliefs of Academic Women and Housewives

CHBMS	Academics	Housewives	Test	
Health beliefs	(n=166)	(n=249)	t	P-value
Susceptibility	6.89±2.28	7.59±2.54	2.933	<0.004
Seriousness	21.5±5.90	23.6±5.63	3.709	<0.001
Benefits	16.5±3.52	15.2±3.51	3.726	<0.001
Barriers	22.5±6.55	30.6±9.87	9.993	<0.001
Self-efficacy	37.3±8.16	29.8±10.5	8.165	<0.001
Motivation	21.8±3.95	20.8±4.76	2.326	<0.021

Mean±SD data

Table 3. Comparison of Health Beliefs and Performance of BSE, CBE and Mammography of Participants

Screening behavior		CHBMS					
		Susceptibility	Seriousness	Benefits	Barriers	Self-efficacy	Motivation
BSE performance	Yes (n=100)	7.04±2.54	22.1± 5.99	16.9± 3.66	22.6± 7.88	39.7± 8.30	22.9± 4.06
	No (n=315)	7.40± 2.44	23.0± 5.77	15.4± 3.47	28.9± 9.54	30.6± 9.96	20.7± 4.49
	t	-1.273	-1.405	3.753	-5.987	8.186	4.372
	P-Value	>0.204	>0.161	<0.000	<0.000	<0.000	<0.000
CBE performance	Yes (n=116)	7.14±2.59	22.5± 5.97	16.6± 3.31	24.4± 8.95	36.3± 9.67	21.6± 4.38
	No (n=299)	7.38± 2.41	22.9± 5.78	15.4± 3.61	28.5± 9.54	31.5± 10.27	21.1± 4.53
	t	-0.902	-0.562	3.199	-4.037	4.351	0.908
	P-Value	>0.367	>0.575	<0.001	<0.000	<0.000	>0.365
Mammography	Yes (n=70)	7.69± 2.69	23.6± 5.49	16.1± 3.15	25.7± 10.15	35.9± 9.66	21.1± 4.29
	No (n=345)	7.24± 2.41	22.6± 5.89	15.6± 3.65	27.7± 9.40	32.1± 10.36	21.3± 4.53
	t	1.388	1.271	0.107	0.396	0.419	0.712
	P-Value	>0.166	>0.204	>0.307	>0.112	<0.006	>0.762

significantly higher than housewives (t= 3.726, P <0.001; t=8.165, P <0.001, t=2.326; P <0.021, respectively). Perceived barriers were significantly lower in academic women than housewife (t=9.993; P < .000) (see Table 3).

It was found that women who had previously performed BSE had significantly higher BSE confidence/ self-efficacy, benefits and health motivation perceptions compared to those women who did not perform BSE (t=8.186, P <0.000; t= 3.753, P <0.000; t=4.372, P <0.001; respectively). Perceptions on CBE benefits and CBE confidence/self efficacy were significantly higher in the women who had previously performed CBE than those who did not have a CBE (t=3.199, P <0.001; t=4.351, P <0.001, respectively). For subjects who previously had a mammogram, only health motivation perceptions were lower than those who had not had a mammogram (t=0.712, P >0.762). Other dimensions of HBM of participants who had a mammogram were higher than those women who had not had a mammogram These differences, however, were not statistically significant. Perceived barriers were lower in groups who had not had any screening behaviors than those participants who had completed screening behaviors.

Discussion

The findings of this study showed that the risk of BC was higher in academic women than housewives, both lifetime and five-year risk calculated using the GM. However, the average lifetime and five-year risk both for academic women and housewife was less than 15% for lifetime risk and 1.7% for five-year risk. Overall, the women in this study population were found to have generally low risk of BC, according to GM. In previous studies (Ceber et al., 2006; Karakayali et al., 2007) similarly reported that the lifetime risk was generally lower according to GM among women in Turkey. Bevers et al (2009) also stated that women in the United States have an estimated lifetime risk of 12.3% for developing breast cancer (i.e., 1 in 8 women). In two studies done by Danø et al, they compared BC risk among seven different groups of women and found similar findings to our results, that BC risk was the highest in academic women compared to the other groups (1.39%) (Danø et al., 2003), (1.09%) (Danø et al., 2004). The authors explained these results by associating the differences in BC risk with their history of fertility and socioeconomic status. This was supported by the results of some other studies (Hussain et al., 2008; Fujino et al., 2008). In addition to these factors, others include reproductive, lifestyle and behavioral factors associated with education that may affect BC risk.

In addition, lifestyle characteristics such as sedentary life due to requiring long hours sitting at work, increased income level and consuming a diet with high animal products as a result of high economic level, etc. may contribute to increased BC risk in academic women.

Early detection of BC is important for treatment and reduction in related mortality. In light of this, many countries have introduced population-based programs that aim to regularly screen at least 70% of target-aged women (Taymoori and Berry, 2009). However, previous studies have demonstrated that women BC screening in Turkey is lower than the desired level (Yavan et al., 2007). Malaysian women (Parsa et al., 2008b), Qatari women (Bener et al., 2009), Irani women (Montazeri et al., 2008), Saudi women (Amin et al., 2009) and Indian women (Khokhar, 2009) all showed a similarly low prevalence of screening for early detection of BC. The results from previous studies performed in these countries may be similar to Turkey due to be socio-economic and cultural factors. Lee et al (2009) found that cultural factors-modesty and use of Eastern medicine were statistically significantly correlated with health beliefs to cancer screening behaviours of Korean American women. In our study sample we showed that academic women completed the recommended BC screening tests such as BSE, CBE and mammography more than housewives but they were still not at the desired level. These results suggest that educational level had a positive impact on performing the breast screening exams. Ekici and Utkualp (2007) reported that 20.9% and 13.3% of academic women completed CBE and BSE, respectively. Ceber et al (2009) also found that 27.7% of academic women performed regular BSEs. Researchers have found that women with less education are less likely to report screening behaviours (Juon et al., 2002). There may be several reasons affecting screening behaviors for BC. The most important factor impacting the low frequency of BC screening performance in housewives may be related to a lack of information about the importance of these tests. On the other hand, the main factors playing influencing BC screening performance among academic

women may be their busy work schedule in combination with a lack of information. Previous studies examining the factor influencing screening behavior determined the most common barriers included lack of information, fear and worries (Bener et al., 2009); inadequate knowledge of breast cancer screening, too busy, forgetfulness, embarrassment, fear of cancer diagnosis and cost (Parsa et al., 2008a); fear of having breast cancer, absence of prominent breast problems, lack of knowledge on how to perform self-examination and forgetting (Demirkıran et al., 2007).

According to the HBM, a woman who perceives she is susceptible to BC and who understands that cancer is a serious disease would be more likely to perform regular BSEs. Additionally, a woman who perceives more benefits from BSE and fewer barriers to BSE would be more likely to practice BSE (Champion, 1993). These factors may also be true for completion of CBE and mammography as well.

As shown in the results of our study, perception of susceptibility and seriousness of HBM was higher in housewives, however, perception of benefits, self-efficacy and health motivation was higher in academic women. Self-efficacy demonstrates the subjects' perception related to the ability to perform the behavior. Educated women may develop high self-efficacy and may have more economic freedom and security in their social status as a result of high educational level which could influence their screening behaviors. Similar to our findings, Ceber et al. (2009) and Çam and Gümüş (2009) have also proposed that women with higher levels of self-efficacy practiced breast screening performances more frequently than women with lower levels. It is thought that high levels of self-efficacy and health motivation in academic women may be related to their education level and social status within the local population.

Champion (1993) noted that the perception of barriers preventing screening tests is important for performance of BSE. In this study, the perception of barriers in academic women who performed any BC screening was found to be lower, consistent with the data of previous studies (Ceber et al., 2009; Seçkinli and Nahçivan, 2006). Our study found that women who had performed BSEs had lower perceptions of susceptibility and seriousness than those who did not do BSEs. Women who had mammograms and CBE had higher levels of perception of BC susceptibility and seriousness than those who had not had either exam. However, these differences were not statistically significant. All women who had completed BSEs, CBEs and mammograms had a higher level of perceptions for benefit and self-efficacy for screening than those who did not complete any screening tests. Lee et al (2009) found that Korean American women who previously had mammograms also had statistically significant higher levels of perceived benefit and susceptibility of BC screening behaviors than those who had not had a mammogram.

A result of this study shows that health beliefs are effective in stimulating performance of BC screening of female academicians and housewife. Although academic women had more screening performance for early diagnosis of BC, it was still lower than 50%, below the desired level. Education programs aimed at increasing women's BC screening behaviors and the positively affect beliefs. Also, it additional studies are needed that to determine the factors affecting breast cancer screening behavior on the larger sample.

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