RESEARCH COMMUNICATION

Factors Influencing Breast Cancer Screening Behavior among Iranian Women

Azita Noroozi[1]*, Rahim Tahmasebi[2]

Abstract

  <u>Background</u>: Early detection of breast cancer is of great importance to improve women's health and to decrease the cost related to cancer death. Therefore, recognition of variables related to breast cancer screening behaviors is necessary. Objectives of this study were to identify the rates of breast self-examination (BSE) performance and mammography use in Iranian women, and to characterize the demographic and cognitive factors associated with their breast cancer screening behavior. <u>Method</u>: Data were collected from a convenience sample of 388 females, using an adapted version of Champion's revised Health Belief Model Scale. <u>Results</u>: The results showed that 7.5% of the participants performed BSE on a regular monthly basis, and among the women aged 40 and older, 14.3% reported having had at least one mammography in their lifetime. Perceived self-efficacy and perceived barriers to BSE were significant predictors for BSE performance. For having mammography, health motivation was the main predictor. <u>Conclusion</u>: Eliminating barriers and increasing perceived self-efficacy with an emphasis to make the women acquainted with BSE performance; as well as increasing health motivation of women and persuading of physicians for clinical breast examination (CBE) performance with low cost and free access to mammography, are important to promote BSE and mammography.

Keywords: Breast cancer - BSE - mammography - Health Belief Model - Iranian women

Introduction

Breast cancer is the most frequent cancer among women worldwide (Pisani et al., 2002; Zeeb et al., 2002). Data from the Western countries indicate that one out of every eight women is likely to develop breast cancer, and that breast cancer is the leading cause of mortality from cancer among women (American Cancer Society, 2000). In Iran, breast cancer ranks as the first cancer among the women, comprising 21.4% of all cancer malignancies among the females (Lamyian et al., 2007). It affects the women in Iran at least one decade earlier than those in the developed countries (Harirchi et al., 2004). In spite of advances in screening and treatment during the past decades, breast cancer still remains a major health problem for Iranian women, as many women have never had a mammography, and yet many of them are not tested regularly. Therefore, breast cancer is detected very late (Ebrahimi et al., 2002; Harirchi et al., 2004; Montazeri et al., 2003).

Early detection and effective treatment are of great importance in decreasing the cost related to cancer death. Empirical evidence suggests that breast self-examination (BSE), mammography and clinical breast examination (CBE) help to ensuring the early detection of breast cancer, thus these methods are valid to reduce cancer mortality and to improve survival rates (Harris et al., 2002). Despite that the breast cancer screening behaviors are effective in reducing mortality, research findings indicate that screening rates remain low throughout the world (Karayurt and Dramali, 2007; Petro-Nustus and Mikhail, 2002; Rashidi and Rajaram, 2000).

One of the major health related targets is to reduce mortality due to cancer, and achievement of this goal depends upon public health education and effective public screening programs in primary health care settings. Accordingly, it is important to have a better understanding of breast cancer screening behaviors and the factors that may influence them.

Cognitive factors play an important role in health behaviors especially in breast cancer screening behaviors (Cohen, 2002). Health Belief Model (HBM) is one of the cognitive models for understanding the general health behavior patterns (Champion, 1999). Champion modified it to examine the beliefs related to BSE and mammography (Cohen and Azaiza, 2005). This model suggests that changes in preventive health behaviors are originally based on four factors: (a) susceptibility: perceived personal vulnerability to or subjective risk of a health condition, (b) seriousness: perceived personal harm of the condition, (c) benefits: perceived positive attributes of an action, and (d) barriers: perceived negative aspects

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of an action (Champion, 1993). Two other concepts, health motivation and self-efficacy, were later added to the original HBM. Health motivation refers to the beliefs and behaviors related to the state of general concern about health. Perceived self-efficacy (confidence) is defined as this belief that one can successfully execute a behavior that will ultimately lead to a desirable outcome (Champion, 1993). Although HBM has widely been served as the theoretical basis for identifying the beliefs and values implicated in breast cancer screening behaviors, interventions based on this model have to be culturally sensitive and competent (Umeh and Dimitrakaki, 2003). Also, socio-economic status, level of education, referral from a physician, health insurance coverage, and family history of breast cancer, as well as knowledge about breast cancer, BSE and mammography have been associated with BSE performance and mammography use (Secginli and Nahcivan, 2006; Juon et al., 2002; Legg et al., 2003; Petro-Nustas and Mikhail, 2002).

To our knowledge, there is little evidence about the factors associated with breast cancer screening behaviors and screening rates among the Iranian women. The purpose of this study was to identify BSE and mammography rates and to examine the variables related to breast cancer screening behaviors in a sample of Iranian women, because, we strongly believe that the findings of this research will help healthcare staff to choose more effective health education programs and potentially increase screening behaviors. The following two research questions were examined in this study: What are the rates of BSE performance and mammography use in the Iranian women? and Which variables are related with breast cancer screening behaviors (BSE and mammography) in these women?

Materials and Methods

Sample

In this descriptive study, 403 women were recruited using a convenience sampling method from the working and public places of Bushehr city in Iran. Permission to this research was obtained from the Bushehr University of Medical Science and the provincial health director of Bushehr city. The aim of the study was verbally explained to the potential participants. Then they were then asked if they agreed to participate in the investigation. The participants were told that they could withdraw from the study at any time and that all information would be kept secret and anonymous. They were also requested to choose the answer that best described their beliefs and opinions. The inclusion criteria were older than 18 years, not pregnant or breast-feeding, lacking mental and/or physical disabilities, and having the ability to read and write. From the total of 403 women, 15 participants submitted imperfect data questionnaire related to BSE. Also among women aged 40 and older (N= 118), 6 participants had imperfect data questionnaires related to mammography use. These participants were not included in the related data analysis.

Instruments and Measures

A self-administered questionnaire and the Champion's Health Belief Model Scale (CHBMS) were used as the data collection instruments (Champion, 1993).

The self-administered questionnaire included the socio-demographic variables of the participants, and Cancer related questions. The socio-demographic variables included age, current marital status, years of education, employment status, contraception method used, gravidity, menopausal status and health insurance coverage. Cancer related questions were included having CBE (yes, no), having a family history of breast cancer (yes, no), having ever heard/read about breast cancer, BSE and mammography (yes, no), and finally sources of breast cancer information. The self-administered questionnaire was developed by the authors based on an extensive review of the literature.

Six subscales of CHBMS were used for evaluating the participants' breast cancer beliefs. They included perceived susceptibility (5 items), perceived seriousness (7 items), perceived benefits (6 items for BSE and 6 items for mammography), perceived barriers (6 items for BSE and 5 items for mammography), perceived self-efficacy (11 items), and health motivation (7 items). In this study, the reliability of these subscales according to Cronbach's alpha coefficients ranged from 0.75 (health motivation) to 0.90 (susceptibility). All items in the six subscales were scored using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher ranking on the Likert scale indicates greater agreement with the health beliefs that were assessed (e.g., a higher self-efficacy score indicates greater perception of self-efficacy and a higher barriers score indicates greater perception of barriers). All of the subscales were positively related to the screening behavior, except for the barriers, which were negatively associated.

The screening behaviors were measured by self-reported response of the participants to regular BSE performance and mammography use. The participants older than 40 years were evaluated for mammography. A detailed description and validation of CHBMS for use in Iran has been documented in previously published paper (Taymoori and Berry, 2009).

Data analysis

The data obtained from the total of 388 completed questionnaires for BSE performance and 112 for mammography use (in the women aged 40 and older) were coded and entered into the statistical package for social sciences (SPSS) version 13.0. Descriptive statistics were used to examine the characteristics of the sample. Then the participants for each of breast cancer screening behaviors were divided into two groups. BSE group 1, the women aged 18 years and older who reported to perform BSE and group 2, the women with the same age who did not perform BSE. Mammography group 1, the women aged 40 years and older who reported to have mammography and Group 2, the women with the same age who had not report to have mammography. Differences between the two groups in each behaviors were assessed by t-test and chi square test. Logistic regression analysis was conducted to assess the predictive values of the study variables on

BE performance and mammography use, separately. The dependent variables were mammography screening (done versus never done) and BSE (done versus never done). Independent variables included HBM components, demographic variables and cancer related variables. In all tests, the level of significance was 0.05.

Results

Sample characteristics:

Overall, 388 Iranian women aged 20 to 66 years old with mean age of 34.32 (SD=10.66) were recruited in this study (see Table 1). The majority of the women (69.1%) were in the age range of 18 and 39 years. Most of the participants were married (75%). 19.1% of the respondents (n = 74) have been educated in the primary/secondary level of education, 41.5% (n =161) were graduated from high school and 39.4% (n = 153) had obtained college degree. The majority of the women (53.4%) were not working and 281 participants (72.4%) perceived their income level as adequate. Three hundred and fifty women (90.2%) had health insurance. Among the 275 married

women, most of the participants (50.6%) used modern contraception methods such as oral contraception pills, IUD and injection methods, 11.6% (n=32) had withdrawal contraception and 37.8% (n= 104) did not use any contraception methods. Their gravidity ranged from 0 to 12 (M= 2.08, SD= 2.3) and 37.4% of the women did not have any pregnancy.

A family history of breast cancer was reported by 12.9% (n= 50) of the participants. The majority of the participants (65.5%) reported that they had heard/read about breast cancer. Radio and TV programs and printed materials were presented as main sources of information about breast cancer by 37.4% and 23.6% of the participants, respectively. Most of the participants (53.6%) had heard/read about BSE. One hundred and forty-four women (37.1%) reported that they had performed BSE at least once in the last 6 months, and only 29 women (7.5%) stated that they performed BSE on a regular monthly basis. Majority of the women (64.3%) aged 40 and older reported that they had heard/read about mammography but only 16 women (14.3%) reported having had at least one mammography in their lifetime. Forty women (10.3%) stated that they had CBE at least once in their lifetime and only 23 women (5.9%) reported that they had annual CBE.

Effective factors in BSE performance

The sample characteristics of the BSE groups are shown in Table 1. BSE performance was significantly related to attending school for college degree, being married, using of modern contraception methods, having heard/read about breast cancer and BSE, and obtaining information from radio and TV programs. No significant association were identified in performing BSE and other variables.

Logistic regression analysis was used to assess the predictors of performing BSE for some demographic characteristics and cancer related variables. Four variables were identified as significant. The women who used modern contraception methods were over 16 times more likely to perform BSE than those who had not any contraception (OR= 16.52, 95% CI 6.84, 12.43). The odds ratio of knowledge about cancer and BSE was 2.69, and 19.6, respectively indicating that the women who had heard/read about cancer and BSE over 2 and 19 times respectively were more likely to perform BSE than those who had not (OR = 2.692, 95% CI 1.48, 4.25 in knowledge about cancer and OR = 19.64, 95% CI 10.64, 28.5 in knowledge about BSE). The women with college education were more likely to perform BSE (OR = 0.32, 95% CI 0.17, 0.61).

The CHBMS components of the two BSE groups are statistically compared in Table 2. Significant differences between the two groups were observed for the subscales of benefits (p = 0.00), barriers (p = 0.00), self-efficacy (p = 0.00) and health motivation (p = 0.01). There were no significant differences between the two groups in the subscales of susceptibility (p = 0.24) and seriousness (p = 0.33).

In the logistic regression analysis, two CHBMS variables had significant odds ratios. The results revealed that the women with greater perceived self-efficacy were

Table 1. Relationships Between the Demographic Variables and BSE Performance

Characteristics		BSE Yes	BSE No	χ2	p value
Age	20-39	99 (68.8)	169 (69.3)		
	40-49	34 (23.6)	48 (19.7)		
	50-older	11 (7.6)	27 (11.1)	1.75	0.41
Education	secondary	19 (13.2)	55 (22.5)		
	high school	49 (34.0)	112 (45.9)		
	college	79 (52.8)	77 (31.6)	17.6	0.00
Job	working	67 (46.5)	114 (46.7)		
	not working	77 (53.5)	130 (53.3)	0.00	0.97
Marriage	yes	122 (84.7)	169 (69.3)		
	single	22 (15.3)	75 (30.7)	11.54	0.00
Gravidit	0	44 (30.6)	101 (41.4)		
	1-2	52 (36.1)	68 (27.9)		
	≥3	48 (33.3)	75 (30.7)	5.02	0.08
Income	adequate	113 (78.5)	170 (69.7)		
	inadequate	31 (21.5)	74 (30.3)	3.64	0.16
Insurance	no	13 (9.0)	25 (10.2)		
	yes	131 (91.0)	219 (89.8)	0.15	0.69
Contraception	not use	30 (25.9)	74 (46.5)		
	withdraw	16 (13.8)	17 (10.7)		
	other	70 (60.3)	68 (42.8)	13.24	0.00
Family history	yes	23 (16.0)	26 (10.7)		
	no	121 (84.0)	217 (89.3)	2.82	0.24
Heard /read about BC	yes	121 (65.5)	133 (54.5)		
	no	23 (16.0)	111 (45.5)	34.90	0.00
Heard /read about BSE	yes	144 (100)	64 (26.2)		
	no	0 (0.0)	180 (73.8)	198.2	0.00

Table 2. Relationships Between CHBMS Subscales and BSE Performance

Subscales	BSE Yes Mean (SD)	BSE No Mean (SD)	t	p-value
Perceived susceptibility	2.13 (0.88)	2.02 (0.86)	-1.17	0.24
Perceived seriousness	3.09 (0.89)	3.19 (0.95)	0.98	0.33
Perceived benefits	4.14 (0.61)	3.88 (0.81)	-3.51	0.00
Perceived barriers	1.75 (0.61)	2.35 (0.81)	8.17	0.00
Perceived self-efficacy	3.45 (0.70)	2.98 (0.78)	-5.91	0.00
Health motivation	4.2 (0.54)	4.05 (0.63)	-2.44	0.01

one time more likely to perform BSE than those with lower perceived self-efficacy (OR = 1.06, 95% CI 1.03, 1.10). The women who perceived greater barriers to BSE were somewhat less likely to perform BSE (OR = 0.83, 95% CI 0.78, 0.89). The other components of CHBMS were not significant predictors for BSE performance.

Effective factors in mammography use:

The data related to mammography (n=112) revealed that there were significant difference in demographic variables of the women who reported having mammography and those who did not. Significant associations were identified among having mammography and having heard/read about breast cancer, having family history of breast cancer and having CBE. Logistic regression analysis was used to identify the predictors of mammography use. Having CBE was the strongest predictor of having mammography. The women who reported that they had CBE were over 16 times more likely to have had mammography than those who had not (OR = 16.77, 95% CI 1.45, 193.97). the women with health insurance were somewhat more likely to have mammography (OR = 0.06, 95% CI 0.00, 0.95).

The means and standard deviations of CHBMS related to having mammography were 2.11 (SD = 0.91) for susceptibility, 3.12 (SD = 0.95) for seriousness, 4.05 (SD = 0.65) for benefits, 4.15 (SD = 0.73) for barriers, and 2.58 (SD = 0.73) for health motivation. Significant differences between the women who had mammography and those who had not were observed for the subscales of barriers (t = 2.37; p = 0.02) and health motivation (t = -2.53; p = 0.01). There were no significant differences between the two groups in the other subscales. Regarding to mammography, only one CHBMS subscale was identified as predictor factor in having mammography by logistic regression analysis. Only the women with greater health motivation were three times more likely to have had mammography (OR = 3.77, 95% CI 1.03, 13.86).

Discussion

Consistent with previous studies conducted in other countries (Phillips and Wilbur, 1995; Salazar, 1994, Petro-Nustas and Mikhail, 2002; Lu, 1998; Cohen and Azaiza, 2005), Iranian women seem to have low rates of regular BSE (monthly) and mammography (annual) (7.5% and 5.9%, respectively). The rate of BSE performance in Iran is lower than other countries, where it ranges from 17% to 32.5% (Secginli and Nahcivan, 2006; Cohen and Azaiza, 2005). The rate of performing regular BSE found here was nearly identical to that (4.3%) of previous study conducted in the Muslim community of Turkish women (Avci, 2008). In our study, 14.3% of the women reported having had at least one mammography in their lifetime. This rate was nearly similar to 11% reported in one sample of Turkish women (Secginli and Nahcivan, 2006) and lower than that reported in other studies (Cohen and Azaiza, 2005; Wu et al., 2006). Therefore, the rate of breast cancer screening behaviors among Iranian women is low and recognition of effective factors for improving behaviors is necessary.

Some socio-demographic and cancer related variables including holding higher education degree, being married, using of modern contraception methods, using radio and TV as information source, and having heard/read about breast cancer and BSE were significantly associated to BSE performance. However, only higher education level, using modern contraception methods, and having heard/read about breast cancer and BSE were the predictors of BSE performance. These results support previous findings in this regard suggesting that well-educated women are more likely to perform BSE (Bottorff et al., 1998; Stein and Fox, 1992; Straughan and Seow, 2000; Avci, 2008; Cohen and Azaiza, 2005). Consistent to the findings of other studies (Cohen and Azaiza, 2005; Han et al., 2000), in the present work, knowledge about BSE was found to be the strongest predictor of performing BSE in Iranian women. It has been revealed that as education level and awareness increase, self-reliance, self-respect and willingness to know one's own body increase as well (Avci, 2008). These findings also suggest the urgent need for increasing women's awareness to become familiar with the feel and appearance of their breasts, and to seek medical evaluation if they notice changes in their breasts.

Concerning the HBM, the women who performed BSE perceived higher benefits, self-efficacy and health motivation, and also fewer barriers than those who did not perform BSE. However, among the subscales only self-efficacy and barriers predicted BSE performance. The findings of this study are consistent with those of other studies, as many studies have found perceived self-efficacy as the most powerful predictor of BSE (Avci, 2008; Jirojwong and MacLennan, 2003; Secginli and Nahcivan, 2006; Umeh and Dimitrakaki, 2003), and some studies have found perceived barriers as an important predictor of the frequency of BSE performance (Cohen and Azaiza, 2005; Umeh and Dimitrakaki, 2003). But, in contrast to HBM and consistent with the findings of other studies, perceived seriousness (Avci, 2008; Secginli and Nahcivan, 2006), perceived susceptibility (Umeh and Dimitrakaki, 2003; Avci, 2008), perceived benefits (Cohen and Azaiza, 2005; Avci, 2008; Secginli and Nahcivan, 2006) and health motivation (Secginli and Nahcivan, 2006; Umeh and Dimitrakaki, 2003) did not significantly predict the BSE performance. One explanation for these findings may be this fact that most women consider breast cancer generally as a serious condition but improbable for themselves (Fung, 1998), as the women in this study perceived more seriousness and less susceptibility to breast cancer than other HBM variables. Previous studies have found conflicting results about perceived benefits and health motivation. For example, perceived benefits and health motivation have been found to be significantly related to BSE performance (Petro-Nustus and Mikhail, 2002; Umeh and Dimitrakaki, 2003; Bazargan et al., 2004; Avci, 2008), whereas others found no significant effects (Secginli and Nahcivan, 2006; Cohen and Azaiza, 2005). Future interventions need to be culturally sensitive and competent to investigate the relationships between perceived benefits, health motivation and BSE performance within Iranian culture. Thus, to promote BSE performance among Iranian women, eliminating the barriers such as feeling embarrassed, finding the

procedure unpleasant, lack of privacy and increasing perceived self-efficacy with emphasis to acquaint them with BSE performance, especially in low literate and illiterate women, are necessary.

Among demographic variables, having heard/read about breast cancer, family history of breast cancer and CBE performance were significantly associated to having mammography, while health insurance and CBE performance were predictors of mammography but the latter was the strongest predictor. A number of studies have found that physician advice after CBE (Soskolne et al., 2006; Azaiza and Cohen, 2006; Han et al., 2000) and consulting with gynaecologist as a regular physician (Secginli and Nahcivan, 2006) are predictors of mammography. Our findings in the present study are similar to those of the other studies that reported women without insurance are significantly less likely to have had mammography (Swan et al., 2003; Bazargan et al., 2004; Joun et al., 2002; Schwartz et al., 2008). This finding may be partially due to the effects of economical and medical care system factors. Therefore, interventions including low cost and free access mammography targeting women, particularly those with no health insurance for breast cancer screening seem to be helpful. Also, the low rate of mammography use could be due to lack of referral to physicians and CBE performance. Efforts to educate health care providers, particularly physicians, should emphasize the importance of mammography referral and periodical check up.

In our study, women with mammography had higher health motivation and fewer barriers but only health motivation was predictor of having mammography. This result is consistent with the findings of Schwartz and et al. study (Schwartz et al., 2008). In another study, perceived seriousness of breast cancer was the significant predictor of mammography use [Secginli and Nahcivan, 2006; Soskolne et al., 2006; Ho et al., 2005).

In conclusion, more efforts are needed to increase health insurance coverage, to promote health motivation and to persuade physicians for CBE performance toward improvement of mammography screening among Iranian women. Due to the small sample size of the women who had mammography in the present study, it was not possible to control the confounding factors when comparing this group with the no mammography group. Therefore, additional research is required to further explore the effective factors on persuading the Iranian women to have mammography.

Since, this study was based on a convenience sample, so that its findings of this study may not be generalized to all Iranian women. Mammography use and BSE performance were evaluated with self-report, whereas mammography use can be more valid via medical record review. Overall, community-based programs should be expanded to different Iranian women groups to assess the actual rate of screening behaviors and effective factors on them.

Acknowledgements

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