

## RESEARCH ARTICLE

# Beliefs and Behaviors of Breast Cancer Screening in Women Referring to Health Care Centers in Northwest Iran According to the Champion Health Belief Model Scale

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## Abstract

**Background:** Breast cancer is the most common cancer in women. All ages are susceptible and more than 90% of the patients can be cured with early diagnosis. Breast self-examination (BSE) and mammography can be useful for this aim. In this study we examined the components of the Champion health belief model to identify if they could predict the intentions of women to perform such screening. **Materials and Methods:** A total of 380 women aged 30 and above who had referred to health-care centers were assessed for use of breast cancer screening over the past year with a modified health belief model questionnaire. Logistic regression was applied to identify leading independent predictors. **Results:** In this study 27% of the women performed BSE in the last year but only 6.8% of them used mammography as a way of screening. There were significant differences regarding all components of the model except for perceived severity between women that underwent BSE over the past year and those that did not. Findings were similar for mammography. Regression analysis revealed that intentions to perform BSE were predicted by perceived self-efficacy and perceived barriers to BSE while intentions to perform mammography were predicted by perceived barriers. **Conclusions:** This study indicated that self-efficacy can support performance of BSE while perceived barriers are important for not performing both BSE and mammography. Thus we must educate women to increase their self-efficacy and decrease their perceived barriers.

**Keywords:** Breast cancer - screening - Champion health belief model - Northwest Iran

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## Introduction

Breast cancer is the most common cancer among women worldwide (Mousavi et al., 2009). The disease embraces 22.9% of invasive cancers and 16% of whole females' cancers (Sariego et al., 2010; Robb et al., 2007). According to the age of new breast cancer cases, the incidence of the disease has increased in a steady way from the mid 1940's (Aronowitz, 2007). Breast cancer, with the highest level of mortality, is the most prevalent, and psychologically and emotionally damaging cancer among Iranian women (Hatefnia et al., 2010). The cancer makes up approximately 18.9% of cancers of all type (Beaglehade, 2003).

Over the late four decades, the rise of incidence rate of breast cancer among Iranian woman has placed it in the most malignant disease group. The incidence rate of breast cancer in Iranian women has been 22 out of 100,000, and has displayed the age range of 15-85, while its peak of incidence has been between 40 and 49 (Hatefnia et al., 2010). Based on the studies undertaken in Iran, it

is reported that over 70000 new cases of cancer occurs annually in Iran, and 30000 of them leads to losing life. Breast cancer is the first malignancy in Iranian women which comprises 24.4% of whole cancers with prevalence rate of 17.81% and age-world-standardized incidence rate (ASR) of 23.65 in 2006 (Mosavi, 2009). After stomach and esophagus cancers, breast cancer is the first malignancy among women in Ardabil, and its incidence keeps rising (Fouladi et al., 2012).

Each year, more than 1,100 new cases of cancer has been registered in Ardabil province and ASR of breast cancer in Ardabil province has been 11.9 per one-hundred thousand individuals, from 2004-2006 (Mosavi et al., 2009). Because of inappropriate screening, the mortality rate of breast cancer in the developing countries has become higher. Lack of facilities for early diagnosis and scarcity of medical programs in the third world countries compared with other countries have resulted in higher rate of breast cancer mortality (Aronowitz, 2007).

Economic and social problems in the third world countries are barriers against proper breast cancer

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screening which lead to late diagnosis of breast cancer, failure in full treatment of the disease, and ultimately increase of breast cancer deaths (Aronowitz, 2007).

There are numerous individual and social factors which are effective in the procedure of screening. Identifying these factors can help health care teams to devise effective plans for diagnosis and immediate treatment of the disease, and avoiding extra costs of therapy and rehabilitation. Regarding the incremental growth and incidence rate of breast cancer in a younger age range, screening and early diagnosis of cancer have been considered as priorities in the health system (Norman et al., 2005; Simon et al., 2006).

The present study examined the individual and social factors affecting breast cancer screening, using the health belief model, and assessed the degree of predictive ability of the model in breast cancer screening among women in the northwest of Iran.

## Materials and Methods

The design of present study was descriptive-analytical, which was undertaken in 2011. The statistical population in this study involved women aged 30 and above. They had referred to health care centers. Using convenience sampling, 380 women were included in the study.

The instrument used in this study was the health belief model questionnaire was modified for Iranian women (Taymoori and Berry 2009).

A five-point Likert Scale was used to measure responses. Strongly agree was scored as five and strongly disagree as one. Also in this study the cases were checked for being or not being screened over the past year.

The data collected were analyzed using SPSS (version 16). T-test, analysis of variance, Pearson correlation coefficient and logistic regression was used. The level of significance, in all of them, was considered less than 0.05.

## Results

In this study, 380 women aged 30 and above who had referred to health care centers were examined.

The number of married and single women was 360 (94.7%), and 20 (5.3%) respectively. One of the women (0.3%) had a record of breast cancer. Of patients, 112 cases (29.5%) were high school graduate (Table 1).

The average age of women under study was 38.12±6.7 ranging from 30-69.

Over the past year, 104 women (27.4%) had done breast self-examination, and 26 patients (6.8%) had undergone mammography.

The scores of respondents related to each component of the model were evaluated. The results about the component of perceived susceptibility revealed that 30 cases (60%) of the participants didn't anticipate the risk of being affected by breast cancer in the future. Concerning the component of perceived severity of breast cancer, 200 patients (52.7%), expressed fear of having breast cancer. Among the cases, 178 patients (46.9%) stated that they had dread of the imagination that they could be affected by breast cancer, and 260 cases (68.5%) noted that they

were scared of grappling with long-term disease problems in the case of being affected by breast cancer. According to the results related to perceived benefits of breast self-examination component, 220 women (57.9%) believed that monthly breast self-examination can reduce the risk of the cancer death, and 202 cases acknowledged that it can increase the probability of early detection of tumors in breast, and lower, in turn, the probability of mastectomy in the case of breast cancer incidence.

The investigation of the results related to component of perceived barriers against monthly breast self-examination showed that 53.2% of cases perceived themselves unable to perform monthly breast self-examination which was one of major barriers against showing this behavior. However, other factors like being time-consuming and feeling embarrassed at monthly breast self-examination are important reasons for not performing this behavior. Instead, 53% of women referred to Mammography as a suitable alternative for breast self examination. Regarding perceived self efficacy in breast self examination 76% of the cases noted that they didn't have knowledge of breast self examination and 76% of women couldn't perform it in a right way. The examination of 92.4% of women's responses to cue to action/Motivation component revealed that women know maintaining health as key incentives for health, but 68.9% of them held that in the case of not getting breast cancer there is no need to have regular health check. Related to perceived benefits of mammography component, 77.4% of women under study were of the opinion that mammography helps to early detection of breast tumors and decreases the risk of breast cancer death, and 50.6% of them considered mammography as the best way to detect small lumps in breast.

The participants' responses related to the component of perceived barriers to mammography showed that fear of being detected for having malignant tumor in breast through mammography in 76.3% of the cases, and lack of familiarity with mammography in 58.7% of the cases were identified as the barriers against mammography. The comparison of the mean of respondents' scores based on their level of education in each component of the model made it clear that as the level of education went upper

**Table 1. Frequency Distribution of Demographic Factors in the Cases Under Study**

Demographic factors		No.	%
Marital status	Married	360	94.7
	Single	20	5.3
Education	Illiterate	35	9.2
	Primary	86	22.6
	Secondary	81	21.3
	High school	112	29.5
	Academic	66	17.4
Occupation	House wife	316	83.2
	Employed	64	16.8
Record of having breast cancer for the patient herself			
	Yes	1	0.3
	No	279	99.7
History of breast cancer in close relatives	Yes	9	2.4
	No	371	97.6
History of breast cancer in distant relatives	Yes	17	4.5
	No	363	95.5
Total		380	100

and upper, the respondents' mean of scores displayed statistically significant increase in the components of perceived benefits (with the mean of  $21.41\pm 3.94$ ) and perceived self efficacy (with the mean of  $29.01\pm 9.82$ ) in breast self-examination, motivation/incentive for health (with the mean of  $25.43\pm 4.68$ ), and perceived benefits of mammography with the mean of ( $21.98\pm 3.05$ ). Put differently, those who were high school graduates or had academic study, had higher levels of the above mentioned variables, compared to others ( $p=0.001$ ). However, perceived susceptibility, and perceived severity scores according to the differentiated level of education of the respondents showed no significant difference. Moreover, the results indicated that the mean of scores for perceived barriers against breast self-examination and mammography had decline, as the level of education increased in the cases under study ( $p=0.001$  and  $p=0.003$ ).

The respondents scores' mean regarding their marital status was presented for each component of the model and reflected that the degree of perceived benefits (with the mean of  $20.05\pm 4.07$ ), and perceived self efficacy in breast self examination for married cases were lower than singles who had the score means of  $22.65\pm 2.45$  and  $29.80\pm 8.9$  of the same components, respectively.

The level of perceived barriers against breast self-examination was higher in married women (with the mean of  $24.31\pm 5.30$ ) than single ones (with the mean of  $21.40\pm 5.40$ ) ( $p=0.005$ ).

However, there was no significant difference among the mean of other components of the model in respect of being single or married.

The results also demonstrated that patients who were employed varied from unemployed cases in terms of the mean of values for different components, in the way that the perceived benefits of breast self-examination and mammography, motivation/incentive for health, perceived self efficacy in breast self-examination, were higher in the employed patients than those unemployed, whereas, the level of perceived barriers against breast self-examination was lower in the employed women than

the unemployed ones ( $p=0.001$ ). However, there was no significant difference between employed and unemployed people, in respect of other components of the model (Table 2). The results also revealed that those who had record of breast cancer in their close relatives (sister or mother) had statistically significant difference compared to others regarding the all components of the model, except for two components of incentives for health and perceived barriers against mammography ( $0.001, 0.023, 0.004, 0.003, 0.018, p=0.006$ ).

Patients with history of breast cancer in their distant relatives varied from other patients, in respect of two components of perceived susceptibility (with the mean of  $8.17\pm 2.4$ ), and perceived barriers against mammography (with the mean of  $22.88\pm 0.046$ ).

Examining the correlation between age and perceived susceptibility revealed their significant and positive relationship ( $r=0.132, p=0.01$ ), while the relationship between age and perceived barriers against mammography was significant and negative ( $r=-0.134, p=0.009$ ).

The number of children and the variables of perceived benefits ( $r=-0.28, p=0.001$ ), perceived self efficacy in breast self-examination ( $r=-0.292, p=0.001$ ), motivation/incentive for being healthy ( $r=-0.244, p=0.001$ ), perceived benefits of mammography ( $r=-0.243, p=0.034$ ), were correlated in a significant but negative way, whereas, the number of children and the variables of perceived barriers to breast self-examination and mammography were correlated in a significant and positive way.

The mean of scores for components of health belief model in patients with experience of breast self-examination and mammography, and those who didn't have the same experience over the past year was compared. Placing the two groups' means of scores in juxtaposition brought significant differences between the scores of two groups to light, except for the component of perceived susceptibility in breast self-examination ( $p=0.001$ ).

The results obtained from logistic regression showed that, among the components of health belief model, the

**Table 2. The Indices of Scores for the Components of Health Belief Model for the Cases Under Study in Employment Status, Breast Self-examination Practice and Mammography Undegone**

Components of model	Group (no)	Mean $\pm$ SD	Group (no)	Mean $\pm$ SD	Group (no)	Mean $\pm$ SD
Perceived susceptibility	Unemployed(316)	6.05 $\pm$ 2.28	Not examined(276)	6.02 $\pm$ 2.36	Not undergone(354)	6.07 $\pm$ 2.34
	Employed(64)	6.62 $\pm$ 2.68	Examined(104)	6.47 $\pm$ 2.33	Undergone(26)	7.07 $\pm$ 2.39
Perceived severity	Unemployed	21.29 $\pm$ 5.42	Not examined	20.89 $\pm$ 5.42	Not undergone	21.23 $\pm$ 5.5
	Employed	22.01 $\pm$ 5.92	Examined	22.7 $\pm$ 5.54	Undergone	23.84 $\pm$ 5.19
Perceived benefits of breast self-examination	Unemployed	19.93 $\pm$ 4.06	Not examined	19.34 $\pm$ 3.96	Not undergone	19.99 $\pm$ 3.97
	Employed	21.4 $\pm$ 3.77	Examined	22.4 $\pm$ 3.38	Undergone	22.84 $\pm$ 4.2
Perceived barrier against breast self-examination	Unemployed	24.61 $\pm$ 5.02	Not examined	25.47 $\pm$ 4.5	Not undergone	24.43 $\pm$ 5.01
	Employed	21.96 $\pm$ 4.72	Examined	20.69 $\pm$ 4.87	Undergone	20.5 $\pm$ 4.37
Perceived self-efficacy of breast self-examination	Unemployed	24.06 $\pm$ 8.59	Not examined	22.05 $\pm$ 6.92	Not undergone	24.29 $\pm$ 8.43
	Employed	29.31 $\pm$ 8.91	Examined	32.65 $\pm$ 8.83	Undergone	33.96 $\pm$ 9.73
Incentives of being healthy	unemployed	23.68 $\pm$ 5.04	Not examined	23.01 $\pm$ 4.9	Not undergone	23.67 $\pm$ 5.02
	Employed	25.59 $\pm$ 4.98	Examined	26.62 $\pm$ 4.61	Undergone	28.68 $\pm$ 3.36
Perceived benefits of mammography	unemployed	20.93 $\pm$ 3.26	Not examined	20.61 $\pm$ 3.12	Not undergone	20.99 $\pm$ 3.19
	Employed	22.26 $\pm$ 2.96	Examined	22.62 $\pm$ 3.14	Undergone	23.46 $\pm$ 3.21
Perceived barrier against mammography	unemployed	25.29 $\pm$ 4.46	Not examined	25.86 $\pm$ 4.34	Not undergone	25.51 $\pm$ 4.56
	Employed	24.26 $\pm$ 5.89	Examined	23.15 $\pm$ 5.19	Undergone	19.69 $\pm$ 3.72

**Table 3. Logistic Regression to Identify Predictors in Breast Self-examination**

Variables	B	S.O.E0.	Sig0.	Exp (B)
Perceived Susceptibility	0.019	0.062	10.019	0.758
Perceived Severity	0.013	0.029	10.013	0.642
Perceived benefits of breast self-examination	0.032	0.047	10.032	0.494
Perceived barrier against breast self-examination	-0.102	0.035	0.903	0.004
perceived self efficacy	0.109	0.021	10.115	0.000
Incentives of being healthy	0.021	0.033	10.022	0.513

**Table 4. Logistic Regression to Identify Predictors in Mammography**

Variables	B	S.E.	Sig.	Exp (B)
Perceived Susceptibility	0.107	0.101	0.287	10.113
Perceived Severity	0.092	0.053	0.083	10.097
Perceived benefits of breast mammography	-0.069	0.097	0.474	0.933
Perceived barrier against mammography	-0.220	0.064	0.001	0.802
perceived self efficacy	0.054	0.036	0.130	10.055
Incentives of being healthy	0.126	0.069	0.067	10.134

two components of perceived self-efficacy and perceived barriers against breast self examination were significantly effective in breast self-examination practice, and those who had done breast self-examination over the past year enjoyed higher perceived self-efficacy than other cases (OR=1.13, p=0.001) (Table 3).

The results obtained from logistic regression on the people undergone mammography reflected that the only component, which had affected mammography in a meaningful way, was perceived barriers against mammography. As a matter of fact, the women performed mammography over the past year, had less perceived barriers compared to other women (OR=0.8, p=0.001) (Table 4).

## Discussion

The results of study showed that there was a significant relationship between the level of education and increase of women's perception of breast self examination and mammography benefits, as well as their perceived self efficacy in breast self examination. The findings of the present study was in line with the results of studies undertaken (Ban-nayeeyan., 2005; Abedian, 2004; Jahangiri, 2007; Karayurt, 2007; Karayurt et al., 2007; Jahangiri et al., 2006; Banayyan et al., 2005; Kasgry et al., 2005). Study on Turkmen women in Iran revealed that the extent of implementing guidelines for healthy behaviors in breast self-examination, the clinical breast examination, and mammography was 13.1%, 2.5%, 0.9% respectively. Only 4% of the Turkmen women in the study had information on breast cancer. Gaining sufficient amount of information about breast cancer was the best predictor of constant breast cancer screening through breast self-examination in the women with high level of education (Abdurrahman et al., 2013).

The results indicated that the degree of perceived benefits of and self efficacy in breast self-examination

were lower in married cases than single ones. However, contrary to the finding of Jahangiri's study the degree of perceived barriers against breast self-examination was higher in married women compared to single women (2006).

This discrepancy can arise from constant preoccupation of married women and their insufficient time for doing breast self-examination. Hereupon it seems necessary to increase the married women's awareness of monthly breast self-examination benefits. As such, the degree of their self efficacy in practicing this action can be raised as well.

Furthermore, it was found that the level of education in single women was higher than married ones. By way of explanation, 100% of single cases in the present study were high school graduate or had academic study, while only 43.9% of the married women were so.

Regarding the effect of level of education on perceived benefits of and perceived self efficacy in breast self-examination, the disparity between married and single women can be attributed to the higher level of education in single women.

The present study also discovered that the employed women enjoyed higher level of perceived benefits of breast self-examination and mammography, cue to action (motivation for being healthy), perceived self efficacy in breast self-examination compared to unemployed cases. This issue was consistent with the findings of the study conducted by Jahangiri et al. (2006). Besides, another study has shown that breast self-examinations was more common among clerks (Aflakseir and Abbasi, 2012). It can be claimed that because of the women's activities outside home and their presence in the academic and educational environments, the level of their awareness and understanding of the above mentioned issues are more than that of unemployed women who have limited access to information resources and modern science.

Taking into account that the majority of the cases included in the present study were unemployed (83.2%), it seems necessary to take actions aiming at improving the unemployed women's attitude toward monthly breast self-examination and mammography, raising their awareness of benefits of these two actions, as well as increasing the amount of their self efficacy in breast self-examination, and creation of motivation for being healthy by interference of educational-health centers. A study by Aflak-Seir and Abbasi (2012) revealed that medical advice had significant effect on perceived barriers against breast cancer screening via mammography.

Since household has a direct relationship with the perceived barriers to breast self-examination and mammography, it can be claimed that the higher the number of children is, the greater the amount of above mentioned barriers. It can be as a result of lack of necessary scheduling and not allocating adequate time for monthly breast self-examination and mammography. It means that as the size of household increases, women become more concerned with the home and children, and don't allocate enough time for taking such actions.

The results indicated that there was direct relationship between age and amount of perceived susceptibility, while there was an inverse correlation between age and

mammography barriers. It can be claimed that women at older age have higher degree of perceived susceptibility than the women at early age. On the contrary, the perceived barriers against mammography reduce in women as they become older, it could be due to the high level of women's concern for being affected by breast cancer in later stages of their life. These results are compatible with the findings of a study conducted by Jahangiri (2006).

Having a record of breast cancer in close relatives, had a direct effect upon the components of health belief model, that is to say, in these cases the perceived susceptibility, perceived severity, perceived benefits of breast self-examination, perceived benefits of mammography, and perceived self efficacy in breast self-examination, were greater than other cases. This effect can be ascribed to the high degree of the patients' concern about the incline of breast cancer incidence risk in their close relatives. As it can be observed the scores of patients who had history of breast cancer in their close relatives, in all of the components (except for the component of perceived susceptibility, which was higher) was lower compared to those who had history of breast cancer in their close relatives. In the people with record of breast cancer in their distant relatives the amount of perceived susceptibility was higher and the present studies' results supported the other studies finding by showing the less breast cancer incidence for this group (Kasgary Abedian et al., 2005; Karayurt et al., 2007). The mean scores of women with the experience of breast cancer, or history of its incidence in their relatives was significantly different in terms of the level of their awareness of breast cancer and practice of breast self examination and mammography (Erbil, 2012). According to obtained results in the present study, only 27.4% of women had the experience of breast self-examination in the past year.

The study of Hasani et al. (2010) showed that 31.7% of women under study had the experience of breast self-examination Hasani et al. (2010). Likewise, the percentage of women with the experience of breast self-examination was 39.8 in Bannayeyan's study (Karimi et al., 2004), and 19 in the study undertaken by Karimi (2004), 39.5 in the study of Anderson et al. (2003), 49.5 in the study Karayurt et al. (2007), 33 in the study conducted by Lee (2003).

By putting the results of the present study alongside the studies mentioned above, it can easily be found out that the experience of breast self-examination reported for women in this study is less than other studies. The reason for this phenomenon can be because of not providing sufficient amount of information, the cultural context of Ardabil city, and underestimating the importance of breast self-examination.

The results obtained indicated that among women under study only 6.8% had undergone mammography. This percentage was lower than the similar studies findings (Fulton et al., 1991; Thomas., 2004; Banyyan, 2005).

A study conducted in Turkey showed that 87.6% of women had record of mammography.

The rate of getting mammography for the group that had high risk of being affected by breast cancer was 11 times greater than the rate for the low risk groups (Yalcinoz, 2012).

In the present study, analyzing the data suggested that degree of perceived severity, perceived benefits of breast self-examination and mammography, perceived self efficacy in breast self-examination for the woman who performed breast self-examination was higher than those who didn't. On the contrary, the level of perceived to against breast self-examination and mammography was lower in this group in comparison to the women who didn't have breast self-examination. But related to the component of perceived susceptibility, there was no difference between two groups. This finding was comparable to some other studies' outcomes (Ganbulat, 2008; Gozum, 2004; Nahcivan, 2006; Hasani, 2010). The investigations demonstrated that the women's awareness of breast cancer risk and the benefits of its early diagnosis of had positive effect on health belief, attitude and behavior of the women (Erbil, 2012).

The finding of present study concerning the degree of prediction of the health belief model constructs for performing breast self-examination showed that perceived self-efficacy and perceived barriers to breast self-examination can predict performing the breast self-examination behavior. Perceived self efficacy in the people who had done breast self-examination was 1.13 times more than those who had not. This difference was statistically significant between the two groups. In fact, self efficacy had direct association with breast self-examination, however, perceived barriers to breast self-examination with coefficient of 0.11 - had an inverse relationship with breast self-examination, so that the perceived barriers to breast self-examination acted as deterrent in performing this behavior.

Therefore, it can be asserted that among the components of the model, perceived self efficacy and perceived barriers to breast self-examination had the highest prediction ability in health belief model, respectively. In the current study, an effective component in health belief model, which had the most important role in prediction, was self-efficacy. The component has also been identified as predictor of model in similar studies (Lee, 2003; Nahcivan, 2006; Hasani, 2010). Interventions and training cultural sensitivities based on health belief model is very effective in changing screening behaviors.

Based on educational programs, it seems that focus on effects of perceived susceptibility and reduction of perceived barriers can exert decisive effect on performing mammography in long-term follow-up (Bakhtariagdam, 2012).

Hereupon, it is better to educate women on how to improve their performance in breast self-examination. For this purpose, health care centers can employ educational posters, animated films, and training courses on how to perform breast self-examination.

As mentioned, one of the predictor components of the health belief model is perceived barriers to breast self-examination, which has also been expressed in other studies, as one of predictors in the model (Nahcivan, 2006).

Perceived barriers to mammography among those performed mammography, compared to that of individuals who had not undergone, was equal to 0.8. It means that,

people who had not undergone mammography, had greater perceived barriers to mammography, and this problem was considered as a hindrance to mammography in individuals.

Between perceived barriers and inclination for performing mammography in the women under study, there was an inverse relationship, such that as the levels of perceived barriers heightened, the women tendency for undergoing mammography showed decline. So it can be mentioned that of the five components influencing mammography, perceived barriers, could highly predict mammography. This outcome was consistent with other studies' findings that found perceived barriers to mammography effective in breast cancer screening. There were several main perceived barriers against performing mammography identified in this study, including: being afraid of a lump to be detected in breast during mammography, lack of knowledge about how to perform mammography, supposing mammography as time-consuming behavior, its painfulness, forgetting the exact time of undergoing mammography, and underestimating it (Fulton et al., 1991).

The studies have indicated that pertaining to the frequency of undergoing mammography, perceived barriers have been the only effective health belief in performing mammography. Ultimately, this model supports the health belief model in performing mammography (Aflakseir and Abbasi, 2012).

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