# Health Beliefs as Predictors of Breast Cancer Screening Behaviour in a Group of Female Employees in Shiraz

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## Abstract

**Background:** The purpose of the present study was to investigate the frequency of getting such health screenings as mammography and breast self-examination among a group of women and also to identify the role of health beliefs in predicting mammography practice.

**Method**s: The data were collected from a convenience sample of 113 female staff at the University of Shiraz and Shiraz University of Medical Sciences. The participants completed the Champion Health Beliefs Scale (CHBS) designed to measure patients' perception on mammography of breast cancer screening. The scale assesses health beliefs components such as perceived susceptibility, perceived benefits of mammography screening, and perceived barriers to mammography screening. The participants also answered several questions on practicing Breast Self-Examination (BSE), mammography screening behaviours and health factors such as family history of cancer, and physicians' recommendation for mammography.

**Results**: The results indicated that 51% of women had BSE, and only 21% had a mammogram. Logistic regression showed that physician's recommendation, and the perceived barriers significantly predicted mammography screening, explaining 27% of the total variance of mammography practice. The participants who saw fewer barriers to have a mammogram and those who had been recommended to have one by their physician were more likely to get it. The present study provides some supports for the health beliefs model.

**Conclusions**: Data indicated that perceived barriers to have a mammogram predicted not getting one, and physicians' recommendation predicted getting a mammogram by women.

**Keywords:** Mammography; Breast self-examination; Cancer screening; Women's health

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## Introduction

Breast cancer is the most common cancer in Iran and the second leading cause of cancer deaths among Iranian women. According to recent data, the prevalence of breast cancer has been increased in Iran in recent years. It is estimated that the lifetime risk of developing breast cancer is 20 new cases per 100,000 for women in Iran annually [1]. In addition, the age of breast cancer among Iranian women has been decreased with ten years younger than their Western counterparts [2]. Therefore, early detection in order to improve breast cancer outcome and survival remains the cornerstone of breast cancer control. Early diagnosis of breast cancer will improve outcomes [3]. A number of screenings have been employed including, mammography, clinical breast examination and Breast Self-Examination (BSE) [4]. Studies revealed that the mortality rate of women with breast cancer was less for women with mammography screening than the control group [5]. The Health Belief Model (HBM) is a psychological model that attempts to explain and predict preventive health behaviours [6]. Health belief model is one the most widely used models to explain the health behaviours such as screening. According to the HBM, individuals are more likely to engage in preventive health behaviours if they believe that a course of action will produce positive outcomes (perceived benefits), perceive themselves to be

**Table 1.** Demographics Characteristics of Female Employees

| **Workplace** | **N** | % |
|---|---|---|
| Shiraz University | 57 | (50.4) |
| University of Medical Sciences | 56 | (49.6) |
| **Age** | | |
| 30-39 | 24 | (21.2) |
| 40-49 | 49 | (43.3) |
| +50 | 40 | (35.5) |
| **Marital Status** | | |
| Single | 30 | (26.5) |
| Married | 81 | (71.7) |
| Widow/separated | 2 | (1.8) |
| **Education** | | |
| High School | 36 | (31.8) |
| Undergraduate | 28 | (24.7) |
| Postgraduate | 49 | (43.3) |

**Table 2.** Frequency of Performing Mammography among Participants

| | **Shiraz University** | **University of Medical Sciences** | |
|---|---|---|---|
| | **Frequency (%)** | **Frequency (%)** | **Total** |
| **Mammography** | | | |
| Yes | 13 (22.8) | 10 (17.8) | 23 (20.3) |
| No | 44 (77.2) | 46 (82.2) | 90 (79.7) |
| Total | 57 (100) | 56 (100) | 113 (100) |
| **BSE** | | | |
| Yes | 35 (61.4) | 30 (53.5) | 65 (57.5) |
| No | 22 (38.6) | 26 (46.5) | 48 (42.5) |
| Total | 57 (100) | 56 (100) | 113 (100) |

susceptible to a certain disease/illness (perceived susceptibility), perceive that obstacles or barriers to taking actions are outweighed by the benefits, or perceive the condition to have potentially serious consequences (perceived severity). Two other concepts, motivation and confidence, were later added to the original HBM. Motivation refers to beliefs and behaviours related to the state of general concern about health. In 1988, Rosenstock et al. added self-efficacy to the list of variables that predict behaviour [7]. The Health Belief Model has been applied to a broad range of health behaviours and populations. Three broad areas can be identified as follows [8]: 1) Preventive health behaviours, which include health-promoting (e.g. diet, exercise) and health-risk (e.g. smoking) behaviours as well as vaccination and contraceptive practices; 2) Sick role behaviours, which refer to compliance with recommended medical regimens, usually following professional diagnosis of illness; 3) Clinic use, which includes physician visits for a variety of reasons. Over recent years, this model has been used to predict a wide variety of health-related behaviours. Numerous studies support the predictions of the HBM. Research indicates that dietary compliance, safe sex, having vaccination, making regular dental visits and taking part in regular exercise programmes are related to the individual's perception of susceptibility to the related health problem, to their belief that the problem is severe and their perception that the benefits of preventive actions outweigh the costs. Many investigations also provided support for dimensions of the model. For example, some researchers have examined health behaviour screening and found that perceived barriers were the greatest predictors of whether a person attended the clinic [9]. Several studies have also investigated breast cancer health behaviours and reported that age, physician recommendation, barrier, benefit and perceived susceptibility are the

**Table 3.** Comparison of Health Beliefs between Performers and Non-Performers of Mammography

| | Performers | | Non-Performers | | | |
|---|---|---|---|---|---|---|
| Health Beliefs Component | M | SD | M | SD | t | p |
| Perceived susceptibility | 7.86 | 2.13 | 7.76 | 2.13 | .17 | .86 |
| Perceived benefits | 18.82 | 3.17 | 18.91 | 2.88 | -.12 | .90 |
| Perceived barriers | 21.17 | 5.83 | 25.76 | 6.42 | -3.11 | .002 |

M: Mean, SD: Standard Deviation, t: t test, p: p value

**Table 4.** Comparison of Health Beliefs according to Workplaces

| | Shiraz University | | University of Medical Sciences | | | |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | t | p |
| Perceived susceptibility | 7.63 | 2.25 | 7.94 | 2.77 | .66 | .51 |
| Perceived benefits | 19.08 | 2.72 | 18.69 | 3.13 | -.99 | .48 |
| Perceived barriers | 25.43 | 6.80 | 24.21 | 6.28 | -.70 | .32 |

M: Mean, SD: Standard Deviation, t: t test, p: p value

**Table 5.** Logistic Regression Analysis Predicting Mammography Practice

| | | | | | | 95.0% C.I. for Odds Ratio | |
|---|---|---|---|---|---|---|---|
| Variable | β | S.E. | Wald | p | Odds Ratio | Lower | Upper |
| History of cancer in family | .46 | .76 | .36 | .54 | 1.58 | .35 | 7.01 |
| Physician's recommendation | 1.64 | .63 | 10.18 | .001 | 5.14 | 1.50 | 17.61 |
| Perceived susceptibility | -.05 | .12 | .20 | .65 | .94 | .74 | 1.20 |
| Perceived benefits | .04 | .09 | .24 | .62 | 1.04 | .62 | 1.24 |
| Perceived barriers | -.15 | .05 | 7.70 | .006 | 1.15 | 1.15 | 1.27 |

B: Beta, S.E: Standard Error, p: p value, C.I.: Confidence Interval

best predictors of screening behaviours [10]. A three-decade study has shown that mammography reduces breast cancer mortality by at least 30% [11]. Previous studies that applied the HBM to breast cancer screening have provided evidence that HBM variables are associated with this behaviour; however, the majority of these studies were conducted with Western subjects and only a few studies have considered Iranian women. Several studies have investigated breast cancer examination behaviour in Iranian women. In a study on a group of Iranian women, age and marital status were predictors of breast self examination [12]. In another research, perceived barriers and self-efficacy were related to mammography [13]. There has been little research regarding the application of health belief model on breast cancer screening behaviours in Iran. The purpose of this study was to explore the frequency of mammography and breast self examination in a group of Iranian women employees in Shiraz University and Shiraz University of Medical Science. This study also aimed to identify predictors of mammography among the female employees based on health beliefs model.

## Materials and Methods

### Participants

One hundred and thirteen female employees were recruited from the University of Shiraz, and Shiraz University of Medical Sciences using convenience sampling method. The participants who had agreed to take part in the study were asked to complete the research questionnaires. The mean age was 48 years ranging from 30 to 60 (SD = 8.02). Most participants were married (71.7%) and about 50% had postgraduate degree. The demographic characteristics are presented in Table 1.

### Measures

Demographic and health variables: A questionnaire containing a number of questions on age, marital status, and education was given to the participants. Furthermore, a number of items related to health factors including family history of cancer, physicians' recommendation for mammography, knowledge about mammography, and the reasons for not getting it were also included in the questionnaire.

Champion's Health Belief Model (CHBM): This scale was used to measure health beliefs. This scale was designed by Champion [14] to assess patients' perception on mammography of breast cancer. The researchers opted to use the 1999 version of CHBM scale, which focuses on mammography screening instead of the breast self-examination focus in Champion's original studies. The scale consists of a total of 4 subscales with the subscales related to mammography. A total of 20 items are in the scale categorized as follows: perceived susceptibility (3 items); perceived benefits of mammography screening (5 items); and perceived barriers to mammography screening (12 items). The participants answered items on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This scale has been used in Iran and found to have a good reliability and validity. The researchers have reported a Cronbach's alpha ranging from 0.77 to 0.93 for different components of CHBM scale [15].

To assess the mammography behaviour, two questions were included to elicit BSE and having a mammogram. Women were asked to indicate whether they had ever practiced BSE or had a mammogram. Those who did were asked to report the frequency of BSE and mammography in the past year.

## Results

Data were analysed using SPSS version 16. The descriptive data are presented in Table 2. As shown in Table 2, about twenty percent of the total sample reported that they had mammograms regularly, while about 80% did not. The proportion of this percentage was more among employees from Shiraz University than Shiraz University of Medical Sciences. Furthermore, about 57% of the sample performed BSE; again this was more among employees of Shiraz University. Of the women who did not have a mammogram, 64.7% reported not having any knowledge or little knowledge about mammography of breast cancer, 17% believed they did not have any physical problems to have mammography screening, 14% reported that they were not old enough, 12% reported not having the time for it, and 10% felt embarrassed to be screened by a man. The vast majority of the participants reporting a mammography in the past year stated that it was recommended by a physician (90%). To compare the frequency of mammography between the two groups of employees (Shiraz University and Medical University of Shiraz), Quai Square analysis was conducted. The results indicated no significant difference between the two groups in terms of frequency of mammography ($\chi^2$=0.42, p<0.51). The findings on frequency of mammography and BSE are presented in table 2.

Similarly, the analysis did not show any significant differences between the two groups in BSE practice ($\chi^2$=1.07, p<0.30). Furthermore, health beliefs dimensions were compared between those participants who performed mammography and those who did not, using an independent t-test. The results indicated a significant difference in perceived benefits of the two groups (t=-3.11, p<0.002), but not in two other components of the health beliefs model. The findings are presented in Table 3. Similarly, the participants from two different universities were compared in terms of health beliefs components. There was not any significant difference in health beliefs among these two groups (Table 4).

To evaluate the predictive value of the variables of mammography, a logistic regression was performed with mammography as dependent variable, and family history of cancer, physician's recommendation, perceived susceptibility, perceived benefits, and perceived barrier as predictor variables. The full model containing all predictors was statistically significant, Wald $\chi^2$ (6, N = 130) =34.69, p<0.001, indicating that the model was able to distinguish respondents who reported having a mammogram from those who did not. The model accounted for 42% of the variance in mammography. As shown in Table 5, only two of the independent variables including physicians' recommendation and perceived barrier made a significant contribution to the model. The analysis indicated that women who saw fewer barriers to get a mammogram and whose physician had recommended it, had a higher probability to get a mammogram. The results did not show any significant contribution for family history of cancer, perceived susceptibility, and perceived benefits. Table 5 provides coefficients, the Wald statistic, associated degrees of freedom, and probability values for each of the predictor variables.

## Discussion

The aim of this study was to examine the relationship between health beliefs and screening behaviour of mammography related to breast cancer and to identify predictors of having a mammogram among a group of university staff. The present study indicated that a low proportion of the sample group got a mammogram (20%), while the findings showed that the participants had a higher proportion of performing BSE (55%). The rates of BSE practice in the current study were higher than

those of previous studies in Iran (31.7%) [13]. Findings on mammography frequency in this study were higher than previous studies in Iran [16], and this might be due to the high education levels of the sample group. The proportion of mammography practice in the present study was also higher compared with some other developing countries such as Turkey [17], but was lower compared to developed countries [18]. A possible explanation for the low proportion of mammography among Iranian women (comparing with developed countries) may be the lack of facilities available for breast cancer screening. In addition, as shown in Table 2, many women may lack knowledge about mammography. Previous studies in Iran have also emphasized lack of knowledge about mammography screening among women [12, 19]. The current study indicated that women who were recommended by a physician to have a mammogram were more likely to get it. Indeed finding of this study on the role of physicians' recommendation in predicting mammography performance was in agreement with other investigations signifying it as the main factor for mammography [10, 13, 20]. Regarding frequency of mammography practice, perceived barriers was the only health belief variable to predict mammography performance frequency. The present results are parallel to those of Wu and colleagues [21], Avicia and Gozumb [22] and Tavafian [13] which showed that perceived barriers was the most significant factor in predicting mammography performance. Perceived barriers to mammography practice included concerns about the discomfort of having a mammogram, not having time to do mammography screening, not knowing where to obtain a mammogram and fear that the test is painful and embarrassing. The finding of the study indicated that perceived benefits and perceived susceptibility did not predict mammography practice in the sample. This result was inconsistent with some previous research indicating a significant contribution of these two health beliefs on mammography [23]. The present study also indicated that family history of cancer did not have a significant role in having mammography among female employees. This finding is in contrast with some other studies [24]. A possible explanation for this result may be that a small number of participants of this study had family history of cancer. The findings of this study provide some support for the health belief model to predict how often Iranian women get a mammogram. Regarding lack of knowledge on health behaviours, health education programs may be useful to promote breast cancer screening in Iran. Efforts to address perceived barriers must emphasize the decreased discomfort of screening, providing convenient screening hours and locations, and implementing effective reminder systems. Efforts should be made to improve the convenience of mammography screening. It may be useful to encourage health professionals to raise awareness of their patients. There are several limitations in this research. One of the limitations is small sample size, so a larger sample with diverse characteristics should be recruited for future studies. Another limitation of this study was limited range of age, so further studies need to consider screening behaviour in different age groups. It is also important to acknowledge that this research was a cross-sectional study. Therefore, it cannot provide any information on the impact of health beliefs on individual's health behaviours over time.

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## Conflict of Interest

The authors have no conflict of interest.

## Authors' Contribution

Abdulaziz Aflakseir designed the study, analyzed the data and wrote the manuscript. Parinaz Abbasi contributed to the data collection and data entry. Both authors read and approved the final manuscript.

## References

1. Mousavi SM, Mohagheghi MA, Mousavi-Jerrahi A, Nahvijou A, Seddighi Z. Outcome of breast cancer in Iran: A study of Tehran cancer registry data. Asian Pacific Journal of Cancer Prevention. 2008;9(2):275-8.

2. Harirchi I, Ebrahimi M, Zamani N, Jarvandi S, Montazeri A. Breast cancer in Iran: A review of 903 case records. Public Health. 2000;114(2):143-5.

3. Levenson V. Biomarkers for early detection of breast cancer: What, when, and where? Biochimica et Biophysica Acta. 2007;1770(6):847-56.

4. Yaren A, Ozkılınc G, Guler A, Oztop I. Awareness of breast and cervical cancer risk factors and screening behaviours among nurses in rural region of Turkey. European Journal of Cancer Care. 2008;17(3):278-84.

5. Jorgensen KJ, Zahl P, Cotzsche PC. Breast cancer mortality in organized mammography screening in Denmark: Comparative study. BMJ. 2010;340:1241.

6. Becker MH, Rosenstock IM. Compliance with medical advice: In: Steptoe A, Matthews A, editors. Heath care and human behaviour. London: Academic Press; 1984:135-52.

7. Ogden J. Health Psychology: A textbook. London: Open University Press; 2004.

8. Conner M, Norman P. Predicting Health Behaviour: Search and Practice with Social Cognition Models. Ballmore, Buckingham: Open University Press; 1996.

9. Norman P, Fitter M. Intention to attend a health screening appointment: Some implication for general practice. Counseling Psychology Quarterly. 1989;2(3):261-72.

10. Cohen M, Azaiza F. Early breast cancer detection practices, health beliefs and cancer worries in Jewish and Arab women. Preventive Medicine. 2005; 41(5-6): 852-8.

11. Maugh T. Mammography Reduces Breast Cancer Deaths by 30%. Los Angeles Times. 2012;6:28.

12. Jarvandia S, Montazeria A, Harirchib I, Kazemnejadc A. Beliefs and behaviours of Iranian teachers toward early detection of breast cancer and breast self-examination. Public Health. 2002;116(4): 2459.

13. Tavafian SS, Hasani L, Aghamolaei T, Zare S, Gregory D. Prediction of breast self-examination in a sample of Iranian women: An application of the Health Belief Model. BMC Women Health. 2009;9:37-45.

14. Champion VL. Revised susceptibility, benefits, and barriers scale for mammography screening. Research in Nursing and Health. 1999;22(4):341-8.

15. Taymoori P, Berry T. The validity and reliability of Champion's Health Belief Model Scale for breast cancer screening behaviours among Iranian women. Cancer Nursing. 2009;32(6):465-72.

16. Farshbaf-Khalili A, Shanazi M, Ghavech A, Torabi S. Breast cancer screening methods and factor influencing on women visiting clinic in Tabriz, Nursing Research. 2010;4(12):27-38.

17. Avici IA. Factors associated with breast self-examination practices and beliefs in female workers at a Muslim community. European Journal of Oncology Nursing. 2008;12(2):127-33.

18. National Center for Health Statistics. Health, United State, With Special Feature on Medical Technology, Hyattsville; 2010.

19. Parsa P, Kaniah M. Breast cancer, knowledge perception, and breast self examination practices among Iranian women. The International Medical Journal. 2005;4(2):17-24.

20. Friedman LC, Neef NE, Webb JA. Early breast cancer detection behaviours among ethnically diverse low-income women. Psycho-Oncology. 1996; 5(3): 283-9.

21. Wu TY, West B, Chen YW, Hergert C. Health beliefs and practices related to breast cancer screening in Filipino, Chinese and Asian-Indian women. Cancer Detection and Prevention. 2006;30(1):58-66.

22. Avicia IA, Gozumb S. Comparison of two different educational methods on teachers' knowledge, beliefs and behaviours regarding breast cancer screening. European Journal of Oncology Nursing. 2009;13(2):94-101.

23. Rutten LF, Iannotti RJ. Health beliefs, salience of breast cancer family history, and involvement with breast cancer issues: Adherence to annual mammography screening recommendations. Cancer Detection and Prevention. 2003;27(5):353-9.

24. Meiser B, Cowan R, Costello A, Giles G, Lindeman GJ, Gaff CL. Prostate cancer screening in men with a family history of prostate cancer: the role of partners in influencing men's screening uptake. Urology. 2007;70(4):738-42.