

Research Article

Socio-Demographic and Cognitive Determinants of Breast Cancer Screening

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ABSTRACT

Breast cancer is one of the causes of cancer death among women. In developed countries, one out of every nine women is diagnosed with this type of cancer. The purpose of this study was to determine the socio-demographic and cognitive determinants related to breast cancer screening among Iranian women's based on the protection motivation theory (PMT). This cross-sectional study was conducted among 385 women's aged 35 to 50 years old referred to health centers in Abadan city, the southwest of Iran, during 2016. Participants filled out a self-administered questionnaire. Data were analyzed by SPSS version 21 using bivariate correlation, and logistic regression statistical tests at 95% significant level. The mean age of respondents was 39.12 years [95% CI: 38.72, 39.53], ranged from 35 to 50 years. Almost 7.5% and 19.1% of the participants had mammography and self-breast examination during last year. Age, education and positive history of breast cancer among family were the best socio-demographic predictive factors of breast cancer screening. Also among theoretical constructs of PMT, perceived severity and self-efficacy were the best predictors on breast cancer screening. Based on our result, it seems that designing and implementation of educational programs to increase seriousness about side effect of breast cancer and increase self-efficacy toward breast cancer screening behavior may be usefulness of the results in order to prevent of breast cancer.

Keyword: Screening, Women Health, Cancer Prevention, Health Promotion.

INTRODUCTION

Breast cancer is the most common malignancy in women and the most common cause of cancer-related death in women ages 20-44. Each year one million new cases of cancer occur in the world of which 500,000 individuals live in developing countries and 600,000 live in developing countries (1). This cancer accounts for about 30 percent of cancers in women and it is the second leading cause of cancer-related death, after lung cancer.

Studies show that breast cancer is the second most common cancer in women in Iran (2). This disease changes the individual's course of life and results in different problems in physical, mental, social, economic and familial aspects and results in the feeling of dependency, reduction of self-confidence, and increase of the feeling of vulnerability, pain, physical symptoms and disturbing thoughts for those with this disease (3).

Considering some characteristics of breast cancer such as slow growth, being detectable in early stages and the effectiveness of treatment in these stages, breast cancer screening is the basis of prevention of this disease and will be the basis of early detection of the disease and consequently the increase of survival. In line with this, self-examination and clinical breast examination in individuals over the age of 30 years are among the most effective methods for early diagnosis of the disease (4, 5). For example, breast self-examination is the easiest and cheapest method for early detection of the disease and is considered as an appropriate breast cancer screening method for women who do not have enough access to healthcare. In similar studies a positive relationship has been found between examination component and early detection of breast cancer and up to 95 percent of cases of early detection were seen in individuals who did breast self-examination (6). Despite conclusive evidence indicating that periodic examinations and breast self-examination is an effective and cheap method for preventing deaths due to this type of cancer, most women do not perform screening tests as a common method that has been recommended by health organization (7). It should be pointed out that the causes of lack of doing breast screening behaviors can be individual, personality, cognitive, social or environmental factors. Perception of cancer risk (perceived threat) and consequently perception of the usefulness of cancer screening method together with perceived self-efficacy of women can be significant elements for the participation of women in breast cancer screening behavior (8). On the other hand, for understanding the existing status of health problems, planners of health promotion programs recommend the use of theories obtained from social psychology for knowing the behaviors that are related to health problem and consider selecting a good theory as the first step in the process of planning health promotion programs (9-11). According to studies protection motivation theory is one of the most applicable models in

exploring the barriers of doing screening behavior and in explaining behavior. Protection motivation theory was proposed by Rogers in 1975, based on expectancy value model, for explaining the effects of fear on motivations and healthy behaviors. In this theory it is assumed that acceptance of a recommended healthy behavior is a direct action from the individual's motivation for protecting the self. Rogers suggested that fear can impact protection motivation through the constructs of self-efficacy, response efficacy, response costs, perceived vulnerability and perceived severity (12-13). Therefore, in order to understanding breast cancer screening behavior, protection motivation theory which is a social psychology theory was employed in this study. The purpose of our study was to determine the socio-demographic and cognitive factors related to breast cancer screening among Iranian women's based on the protection motivation theory (PMT).

METHODS

This cross-sectional study was conducted among 385 women's aged 35 to 50 years old referred to health centers in Abadan city, the southwest of Iran, during 2016. For sampling, first the health centers of Abadan were considered as clusters and, using simple random sample and with probability proportional to size, the participants were selected in each cluster. Then, the participants were given the designed questionnaires and their information was collected with self-reporting and interview. The participants were given explanations on the way the study is conducted, the aim of the study and the confidentiality of the information and they entered the study willingly. Of the population of 385, 293 (76.1%) signed the consent form and voluntarily agreed to participate in the study, which has been approved by the research institute of Abadan school of Medical Sciences, Iran. Only the subjects who were aged between 35 to 50 years old and without the related diseases of breast were eligible to participate in this study. This study has been approved by the Institutional Review Board

at the Abadan School of Medical Sciences, Abadan, Iran (IR.ABADANUMS.REC.1394.57). Questionnaire included three sections that comprised of forty-six questions: seven questions for demographic factors, two questions about breast cancer screening behaviors, and thirty-six questions for PMT variable.

Demographics

The variables assessed in this study included: age, education level, husband educational level, job, have a health insurance, economic status, and history of breast cancer in family.

Breast cancer screening behaviors questionnaire

To assess whether or not the participants had experimented with breast cancer screening behaviors, we used two questions “Have you ever did self-breast examination at during last year” and “Have you ever did mammography at during last year” which the response category was yes or no.

PMT variable

PMT scale was designed based on standard questionnaires (12, 13) and included thirty-six items under five constructs including (a) perceived susceptibility of the threat of breast cancer; (b) perceived severity of side effect of breast cancer; (c) perceived response costs of breast cancer screening behaviors; (d) perceived response efficacy breast cancer screening behaviors; (e) perceived self-efficacy related to breast cancer screening behaviors; (f) perceived fear of breast cancer; (g) perceived reward of breast cancer screening behaviors. Prior to conducting the main project, a pilot study was carried out. Initially the relevant questionnaires were administered to 30 participants who were similar to study population in order to estimate the duration of the study conduction and to evaluate the reliability of the questionnaire. Estimated reliability using alpha Cronbach coefficient for each PMT constructs questionnaire were as follows: perceived susceptibility of the threat of breast cancer ($\alpha=0.71$); perceived severity about side effect of breast cancer ($\alpha=0.89$); perceived response costs

of breast cancer screening behaviors ($\alpha=0.74$); perceived response efficacy breast cancer screening behaviors ($\alpha=0.85$); perceived self-efficacy related to breast cancer screening behaviors ($\alpha=0.81$); perceived fear of breast cancer ($\alpha=0.82$); perceived reward of breast cancer screening behaviors ($\alpha=0.83$). Furthermore, the content validity was verified by experts group including a medical educator, and women health specialist.

Four items were designed to measure perceived susceptibility (e.g. “At my age the risk of breast cancer is very low.”). Six items were designed to measure perceived severity (e.g., “breast cancer complication, it could seriously affect in my social life.”). Four items were designed to response costs (e.g., “if I doing breast cancer screening behaviors, will be too expensive for me”). Eight items were designed to response efficacy (e.g., “breast cancer screening behaviors help me to prevention of death because of breast cancer”). Six items were designed to rewards (e.g., “if I do breast cancer screening behaviors, help me to improve my self-confidence”). Four items were designed to fear (e.g., “even think about breast cancer, scares me”).

In order to facilitate participants’ responses to the items, all items were standardized to a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Data were analyzed by SPSS version 21 using appropriate statistical tests including bivariate correlations and logistic regression at 95% significant level.

RESULTS

The mean age of respondents was 39.12 years [95% CI: 38.72, 39.53], ranged from 35 to 50 years. Regarding the educational status: 16.7% (49/293), 33.1% (97/293), 43.3% (127/293), 6.8% (20/293) were elementary, secondary, diploma, and academic education, respectively. 9.2% (27/293) participants were employed and 90.8% (266/293) were housewife. Furthermore, 4.1% (12/293) of respondents was reported don’t have

health insurance. In addition, 8.9% (26/293) of respondents had positive history of breast cancer in family. 7.5% (22/293) and 19.1% (56/293) of the participants had mammography and self-breast examination during last year.

Table 1 shows the Zero-order correlations. Significance levels at the 0.01 and 0.05 were the criteria for the analysis of protection motivation theory constructs.

Table 1: Correlation between different components of protection motivation theory

Component	X1	X2	X3	X4	X5	X6
X1. Susceptibility	1					
X2. Severity	0.355**	1				
X3. Response Costs	-0.125*	-.452**	1			
X4. Response Efficacy	0.142*	0.443**	-0.253**	1		
X5. Self-Efficacy	0.201**	0.353**	-0.314**	0.744**	1	
X6. Rewards	0.320**	0.298**	-0.220**	0.643**	0.513**	1
X7. Fear	0.094	0.416**	-0.305**	.159**	0.209**	-0.066

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Logistic regression analysis was calculated for predictability of and background variables on breast cancer screening behaviors. As mentioned in statistical analyses (Table 2), a step-wise model building procedure was conducted and finally on 7th step (for mammography), and 8th step (for BSE), the procedure stopped and the best model was selected, among the background variables: age, education and positive history of breast cancer among family were predictive factors of breast cancer screening behaviors (mammography and self-breast examination).

Table 2: The correlation between background variables and breast cancer screening behaviors (mammography and self-breast examination) using logistic regression analyze

Variable	β	SE(β)	Wald	P-value	OR	Lower	Upper
Background Variables Predictive Factors of Mammography Final Model; Step 7							
Age	0.120	0.059	4.078	0.043	1.127	1.004	1.266
Education	1.039	0.343	9.177	0.002	2.828	1.443	5.540
Positive history of breast cancer among family	1.283	0.563	5.193	0.023	3.607	1.197	10.870
Background Variables Predictive Factors of SBE Final Model; Step 8							
Positive history of breast cancer among family	1.285	0.4290	8.5877	0.003	3,520	1.517	8.168

Finally, a step-wise model building procedure was conducted and on 6th step the procedure stopped and the best model was selected (for mammography), and 7th step the procedure stopped and the best model was selected (for BSE), and among the protection motivation theory constructs: severity and self-efficacy the more influential predictors on breast cancer screening behaviors (mammography and self-breast examination) (Table 3).

Table 3: The correlation between protection motivation theory variables and breast cancer screening behaviors (mammography and self-breast examination) using logistic regression analyze

Variable	β	SE(β)	Wald	P-value	OR	Lower	Upper
PMT Variables Predictive Factors of Mammography Final Model; Step 6							
Perceived Severity	0.922	0.358	6.643	0.010	2.515	2.247	5.072
Perceived Self-efficacy	0.138	0.068	4.160	0.041	1.148	1.005	1.310
PMT Variables Predictive Factors of SBE Final Model; Step 7							
Perceived Severity	0.075	0.031	5.776	0.016	1.077	1.014	1.145

DISCUSSION

Our findings indicated 7.5% and 19.1% of the women's had mammography and self-breast examination during last year. In this regards, Noroozi and Tahmasebi carried out a research on women's in the southwest of Iran and reported only 7.6% and 14.3% of the subjects in their study had regular self-breast examination and last one mammography in their lifetime (14). Also, the findings of the study by Karimy et al in central Iran indicated that the performance of breast self-examination was highly low in the target group (15). According to the results reported by Parsa et al in a study conducted on female teachers in Selangor, 19 percent of the teachers explored perfumed breast self-examination regularly (16). Breast self-examination is one of the methods for timely detection of breast cancer and reduction of the mortalities due to it and it is considered as an appropriate, effective and free method for early detection of breast cancer. And in countries in which breast cancer is advancing as a health problem or clinical examinations and especially mammography are not available to women in a cheap and comfortable way, regular breast self-examination can result in the improvement of the knowledge and attitude of the society toward cancer and its preventing methods, in addition to helping the early detection of the disease (17). The findings of the present study indicate that family history of affliction with breast cancer is a predictor of breast self-examination and mammography behaviors in a way that the women with a family history of breast cancer performed breast self-examination behavior more, compared with women who had no family history of breast cancer. The present results can be due to the increase of sensitivity of individuals with a family history to the disease that has increased doing breast self-examination in them (19, 20). Also, education and higher age were predictors of undergoing mammography in the women explored in this study. In this regard, it should be said that younger individuals have lower vulnerability perceptions regarding the risks around them and,

in other words, consider themselves immune to health risks and threats and do not feel a need to adopt preventive behaviors. In fact the term 'invulnerability' describes the perception of these individuals who think that they are at risk of dangers less, compared with others, and this belief weakens the adoption of any preventive behavior (21). As the age at onset of breast cancer in Iranian women is similar to that of women in developing countries and is lower than that of women in developed countries, and the most common age at which people die due to this disease in Iran is between the age of 34-44 (1), providing interventions in health programs for Iranian women is recommended to be paid attention to. On the other hand, it seems that the knowledge of breast cancer in women is increased with the increase of their education and thus, providing educational programs on the preventive methods for breast cancer for women with lower levels of education seems necessary.

Our results showed, severity and self-efficacy the more influential predictors on breast cancer screening behaviors (mammography and self-breast examination). In this regard, many studies indicate that the constructs of perceived severity and self-efficacy are strong predictors of preventing and screening behaviors (22-26). For example, in a study that was conducted by Almut et al on the application of fear appeal theory in doing protective behaviors against breast cancer in 330 women ages 18 to 64 in Washington D.C, the results indicated that the women who had perceived a higher level of threat of cancer and the women who had the knowledge of the advantages of protective methods were more motivated and had a higher level of motivation. Overall, the findings of the study emphasized the application of fear appeal model as a determining factor by having an important role in predicting women's intention to do protective actions against breast cancer (22). The results of this study reveals the necessity of paying more attention to education and promotion of breast cancer screening methods by health planners in Iran and reveals that

education should not be emphasized alone for increasing the use of a health action and paying attention to other existing barriers and resolving them should also be done.

CONCLUSION

7.5% and 19.1% of the women's had mammography and self-breast examination during last year. In addition, perceived severity and self-efficacy were the best predictors on breast cancer screening behaviors.

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Conflict of Interest Statement

Authors declare that there is no conflict of interest.

REFERENCES

1. Keyghobadi, N., Rafiemanesh, H., Mohammadian-Hafshejani, A., Enayatrad, M., & Salehiniya, H. (2015). Epidemiology and trend of cancers in the province of Kerman: southeast of Iran. *Asian Pac J Cancer Prev*, 16(4), 1409-13.
2. Sadjadi A, Nourai M, Mohagheghi MA, Mousavi A, Malekezadeh R, Parkin DM. Cancer occurrence in Iran: an international perspective. *Asian Pacific Journal of cancer Prevention* 2005; 6(3):359-63.
3. Courtens AM, Stevens FC, Crebolder HF, Philipsen H. Longitudinal study and quality of life and social support in cancer patients. *Cancer Nurs* 1996; 19(3): 162-169.
4. Rutledge DN, Barsevick A, Knobf MT, Book binder M. Breast cancer detection: Knowledge attitudes and behaviors of women from Pennsylvania. *Oncol Nurs: Forum*. 2001; 28(6): 1032-40.
5. Chong PN, Krishnan M, Hong CY, Swan TS. Knowledge and practice of breast cancer screening amongst public health nurses in Singapore. *Singapore Med J* 2002; 43(10): 509-516.
6. Okobia MN, Bunker CH, Okonofua FE, Osime U. Knowledge, attitude and practice of Nigerian women towards breast cancer: A cross-sectional study. *J Surg oncol* 2006; 4: 11-19.
7. Shampion V. Development of a benefits and barriers scale for mammography utilization. *Cancer Nursing* 1995; 18(4): 53-59.
8. Jirojwong S, Mac LR. Health beliefs, perceived self –efficacy, and breast self – examination among Thai migrants in Brisbane. *Journal of Advanced Nursing*, 2003; 41(3): 241- 9.
9. Jalilian, F., Ataee, M., Matin, B. K., Ahmadpanah, M., Jouybari, T. A., Eslami, A. A., ... & Mirzaei-Alavijeh, M. M. (2015). Cognitive factors related to drug abuse among a sample of Iranian male medical college students. *Global journal of health science*, 7(5), 143.
10. Eldredge, L. K. B., Markham, C. M., Kok, G., Ruitter, R. A., & Parcel, G. S. (2016). Planning health promotion programs: an intervention mapping approach. John Wiley & Sons.
11. Kok, G. (2014). A practical guide to effective behavior change: How to apply theory-and evidence-based behavior change methods in an intervention. *European Health Psychologist*, 16(5), 156-170.
12. Helmes AW. Application of the protection motivation theory to genetic testing for breast cancer risk. *Preventive Medicine*, 2002; 35(5): 453-462.
13. Milne S, Sheeran P, & Orbell S. Prediction and intervention in health-related behavior: A meta-analytic review of protection motivation theory. *Journal of Applied Social Psychology*, 2000; 30(1): 106-143.
14. Noroozi A, Jomand T, Tahmasebi R. Determinants of breast self-examination performance among Iranian women: an application of health belief model. *J Canc Educ* 2011; 26: 365-374.

15. Karimy M, Niknami Sh, Amin Shokravy F, Shamsi M, Hatami A. The Relationship of breast selfexamination with self-esteem and perceived benefits/barriers of self-efficacy in health volunteers of Zarandieh city. *Iranian Journal of Breast Diseases* 2009; 2(2): 41-48. [In Persian]
16. Parsa P, Kandiah M, Mohd Zulkefli NFM, Abdul Rahman H. Knowledge and behavior regarding breast cancer screening among female teachers in Selangor, Malaysia. *Asian Pacific Journal of Cancer Prevention* 2008; 9: 221-228.
17. Yarbrough SS, Braden CJ. Utility of health belief model as a guide for explaining or predicting breast cancer screening behaviors. *J Adv Nurs* 2001; 33(5): 677-688.
18. Jalilian, F., & Emdadi, S. (2011). Factors related to regular undergoing Pap-smear test: application of theory of planned behavior. *Journal of research in health sciences*, 11(2), 103-108.
19. Çam O, Babacan Gümüs A. Breast cancer screening behavior in Turkish women: relationships with health beliefs and self-esteem, body perception and hopelessness. *Asian Pacific Journal of Cancer Prevention* 2009; 10: 49-54.
20. Sim HL, Seah M, Tan SM. Breast cancer knowledge and screening practices: a survey of 1000 Asian women. *Singapore Med J* 2009; 50(2): 132-138.
21. Fontaine KB, Smith S. Optimistic bias in cancer risk perception: A cross national study. *Psychol Rep* 1995; 77(1):143 – 146.
22. Almut WH. Application of the Protection Motivation Theory to Genetic Testing for Breast Cancer Risk. *Preventive Medicine* 2002; 35(1):453–462.
23. Baghiani Moghadam MH, Mirzaei-Alavijeh M, Zolghadr R. Knowledge, Risk Perceptions and Behavioral Intentions among Elementary School Teachers of Yazd Regarding Hepatitis A. *Govaresh* 2012; 17(2):84-90.
24. Morowatisharifabad MA, Mirzaei-Alavijeh M, Ghaneian M, Abbasi H, Golshirzadi S, Karamzadeh M. Beliefs of refrigerator craftsmen about prevention of health and environmental hazards of chlorofluorocarbons: application of health belief model.
25. Jalilian F, Hazavehei SM, Vahidinia AA, Jalilian M, Moghimbeigi A. Prevalence and related factors for choosing self-medication among pharmacies visitors based on Health Belief Model in Hamadan Province, West of Iran. *Journal of research in health sciences*. 2013; 13(1):81-5.
26. Mirzaei-Alavijeh, M., Mahboubi, M., Jalilian, F., Aghaei, A., and Ahmadi-Jouybari T. (2015). Factors related to self-breast examination based on health belief model among Iranian women. *Research journal of medical science*, 9(3), 105 – 108.