Electronic Physician (ISSN: 2008-5842) http://www.ephysician.ir
June 2017, Volume: 9, Issue: 6, Pages: 4577-4583, DOI: http://dx.doi.org/10.19082/4577

Effect of health-belief-model-based training on performance of women in breast self-examination

Fatemeh Nahidi[1], Mahrokh Dolatian[1], Nasibeh Roozbeh[2], Zeynab Asadi[3], Nezhat Shakeri[4]

[1] Assistant Professor, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2] Mother and Child Welfare Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran
[3] M.Sc. Student of Midwifery, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[4] Department of Biostatistics, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Type of article: Original

Abstract

Background: Breast cancer is the most common cause of cancer death among women in the world. With prevention and examinations, including breast self-examination, the death rate will be reduced.

Objective: The purpose of this study was to determine the effect of health-belief-model-based training on the performance of women in breast self-examination in the province of Fars (Iran).

Methods: An empirical study examined the effect of an eight-week training program based on the health belief model among 144 women who visited health care centers in the city of Abadeh in Fars Province (Iran) in 2015. Data gathered through researcher-made questionnaires including awareness, components of the health belief model, performance, and demographic information. IBM-SPSS software version 20, descriptive and inferential statistical tests such as T-test, chi-square, Mann–Whitney, and repeated measurements were used for data analysis.

Results: After the intervention, a significant difference was seen in average awareness, perceived susceptibility, and performance of women ($p<0.05$), while it was not significant in benefits constructs, perceived barriers, and perceived severity and practice guide. After intervention, the average score of awareness was increased significantly ($p<0.001$). Also, the average score of performance in breast self-examination showed a significant difference ($p<0.001$).

Conclusion: Due to the low level of awareness of women about breast self-examination, using a health belief model with an increase of the perceived susceptibility could be effective in improving their performance in breast self-examination.

Keywords: Health belief model, Self-examination, Breast cancer, Breast

1. Introduction

Breast cancer is the most common cause of cancer death among women in the world. The incidence rate is about 1,384,000 cases a year; the age-specific incidence of the disease was 39 in 2008; and the rate of breast cancer death is reported at 458,503 in the world (1). Less than 1% of breast cancers occur in women younger than 25, but a sharp increase is seen in the incidence of breast cancer after 30 (2). The results of an international study about breast cancer in developing countries reflects the fact that that, among 400,000 cases of breast cancer death, about 55% occurs in low-income countries (3). This type of cancer is now the most common cancer in Southeast Asia, East Asia, and South Asia; it is the most common cancer in the female population group after stomach cancer and cervical cancer (4). Breast cancer currently has allocated the first place of prevalence in developing countries and developed countries. There are significant differences in the incidence of cancer indifferent countries. However,

Corresponding author:
Assistant Professor Dr. Fatemeh Nahidi, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
Tell: 98 21 88202512, Email: nahidi@sbmu.ac.ir
Received: January 16, 2016, Accepted: February 10, 2017, Published: June 2017
iThenticate screening: January 26, 2017, English editing: March 20, 2017, Quality control: April 16, 2017

genetics is one of the effective factors on breast cancer epidemiology, but because its incidence is variable in immigrants and is similar to the host country, it would show that lifestyle of environmental factors influence the risk of breast cancer incidence (5). These factors include using health maintenance programs, such as the possibility of early detection of screening programs (6). In Iran, 16% of all cancers have been allocated to breast cancer (7). Treatment of breast cancer patients in Iran costs over 836.304 billion Rial, and the imposed burden of the disease is significant. The most expensive part of the treatment is drug therapy (8). In Pakistan, one in nine women suffers from breast cancer, which is 2.5 times higher compared with those in neighboring countries such as Iran and India. Risk factors include age, family history of breast cancer, early menarche, receiving estrogen and progesterone hormone in menopause, alcohol use, physical inactivity, low economic and social situation, and lack of awareness about breast cancer (9). Breast cancer causes death in 60% to 70% of those who have uncertain risk factors (7). Although the incidence of breast cancer cannot be prevented, its early detection can increase the lifetime of more than 90% of patients suffering from this cancer (10). Wen Li Wang came to the conclusion that women with a history of breast cancer more specifically participated for screening with mammography regularly (11). Early detection of breast cancer by screening tests such as breast self-examination, clinical examination, and mammography has a strong role in reducing mortality rates caused by breast cancer, and, according to the American Cancer Society, women should certainly be familiar with breast self-examination and be able to report minor changes in the breasts to health care workers in the early stages. Because 95% of breast cancer at advanced stages and 65% at the early stages are discovered by the patient, unfortunately, despite the benefits of regular breast self-examination, still some women do not do that. Considering that screening behaviors such as breast self-examination, mammography, or examination by doctor and midwife are under the control of patient, it depends on the health control axis; therefore, the concept of health control is an important element in people's perception of their control on health behaviors (12).

The health belief model usually explains preventive health behaviors, which are defined by Cassell and Kobe. Health behavior is a behavior that includes any activity a person believes should be done before the appearance of symptoms in order to prevent the disease, and it is the opposite of patient reaction (13). Considering the significant relationship between the health control axis and screening behaviors, on the other hand, and that the health belief model is one of the common patterns used to identify effective factors on screening behaviors, including constructs such as susceptibility, perceived severity, perceived benefits, motivation and self-efficacy, then predictive factors of health axis can be discovered based on the health belief model, and people can be led to do screening behaviors using training interventions (14). Yan Lee et al. reported that 64% of participants have done breast self-examination at least once in their lifetime and 81% of the samples had done mammography. Women more susceptible to breast cancer were more interested in doing breast self-examination and women with fewer barriers or higher level of self-confidence went for mammography. These findings suggest that, when the purpose of intervention is to improve breast cancer screening, the constructs of perceived susceptibility, perceived barriers, and self-efficiency should be further considered. The health benefit model has been generally approved to describe the cancer screening concession and used to identify breast cancer screening behaviors among women in recent times (15). Due to the high incidence of breast cancer in women and the significant role of breast self-examination, along with regarding women as vulnerable in regards to human rights principles, as well as those who provide comfort in home, few studies have been conducted in regards to women's performances via the health belief model in Iran; perhaps this health training model can be used for training of specialist health workers so that they can encourage women with better motivation to do screening tests; therefore, it was decided to perform a study aimed to determine the effect of health-belief-based training on women's performance to do a breast self-examination in the province of Fars in 2014.

2. Material and Methods

2.1. Research design and setting

This empirical study was performed during eight weeks on women visiting health care centers of Abade City in Iran in 2016. The sample size was determined to be 144. Among the study population, a sample size of 72 subjects was selected in a control group and the same number for the intervention group. Inclusion criteria were ages 30–65, no history of breast cancer, ability to read and write and regular visiting of training classes, and no regular breast self-examination. Thus, the sampling was conducted in two steps. The first step was the random selection of clusters. Thus, a list of health care centers of Abade was prepared; in the second step, it continued in a systematic approach by one day per week visiting of five city centers of selected centers.

2.2. Measurement tool

All the female visitors who have inclusion criteria, gave written consent to participate in the study. Tools used in this study such as questionnaires were adjusted in accordance with the model in four parts: Demographic characteristics contains nine questions; knowledge measurement questionnaire contains 15 questions; the components of health belief model questionnaire was designed in 5-point Likert scale, and a total of 31 questions, including nine perceived susceptibility questions, five perceived severity questions, three perceived benefits questions, eight perceived barriers questions, and six practice guide questions, along with performance, which contains eight questions and evaluates the research unit behaviors. Content validity and face validity methods were used in order to determine validity of the questionnaire and internal consistency methods such as Cronbach's alpha used for reliability. The alpha of all health belief model constructs was calculated at 0.75.

2.3. Intervention and data collection

After removing the questionnaire defects, the final development questionnaire and 72 women among 144 were placed in the intervention group, and the same number in the control group was invited to complete a pre-test questionnaire. Then, the questionnaires were completed through interviewing and by the researcher, and the intervention group was invited to participate in training classes. According to the objectives and available resources and results of the pre-test step, the training needs assessment was done, and training materials and methods and the number of sessions determined. Sessions were accomplished during a month and in four sessions. Thus, the participation of 18 subjects was scheduled every week in class, and each class was adjusted at 90 minutes. Also, training PowerPoint slides and pamphlets were prepared for the intervention group based on response to model constructs, which were collected from the questionnaire before intervention. The contents were conducted as presentations, Q&A, and playing videos as well as accurate breast examination, while the control group received the same training conventional method. No training intervention was performed on the control group. Also, the performance of women in regards to breast self-examination assessed before training and checklist of the SBE performance was completed before training. Training materials used included a training manual, pamphlet and training slides about breast cancer, screening and breast self-examination. After training, the checklist of breast self-examination was completed through observation of performance immediately and two months after the training. Also, the training was given to all the intervention group subjects indirectly as training manual containing information required for diagnosis of breast cancer. After two months of intervention (due to the effect of the health belief model in the short term) the subjects visited once again (control and test), and the questionnaires were completed to measure the effect of intervention. Because the target group was interested, no one refused the evaluation

2.4. Research ethics

The approval number of this study was SBMU.REC.1394.104. After receiving a letter of introduction from the international branch of Shahid Beheshti University of Medical Sciences and referral to the province health center, the purpose of research was explained. The consent form was completed for participants and data confidentiality was explained. All women were included voluntarily if they had the inclusion criteria.

2.5. Statistical analysis

Data analyzed statistically by IBM© SPSS© Statistics version 20 (IBM© Corp., Armonk, NY, USA) after being extracted from the questionnaire. Descriptive and inferential statistical tests such as t-test, chi-square, Mann–Whitney U test and repeated measurements were used for data analysis

3. Results

All 144 women participating in the study were analyzed in terms of demographic characteristics according to Table 1. Results of the chi-square statistical test between the intervention and control groups showed no significant difference in terms of housing, income, job, spouse's job, and family life. In the control and intervention group, the most frequency is associated with age group of 30–39 years old. In both groups, the married ones have allocated the most frequency (93% in the intervention group and 94.4% in the control group). The majority of subjects had a high school diploma. The spouses of 30.5% of intervention group subjects and the spouses of 33.3% of control group subjects had a high school diploma; 84.7% of control group subjects and 91.6% of intervention group subjects were housewives. Also, 61.1% of control group subjects and 45.8% of intervention group subjects have self-employed spouses. In both groups, 40.3% of subjects consider clinic staff and 22.2% considered television as the source of information before intervention. Also, 14.6% had no source of information. After the intervention, in the intervention group 22.9% mentioned health care and training workers as their first source of information. The

knowledge average before intervention in the intervention group was 16.11, which increased to 27.7 with training (Table 2). Results of independent-samples t-test between both groups also showed a significant difference after intervention ($p<0.001$). Also, there was no significant difference between the average score of perceived susceptibility in both groups before the training intervention and the difference become significant two months after training intervention ($p<0.05$). Results between two independent-sample t-tests of intervention and control groups showed that, with training intervention, there was no change in average score of perceived severity, perceived benefits, perceived barriers, and practice guide. The average score of women's performances in the intervention group before intervention was 20.97, which increased to 24.07 after intervention and t-tests showed a significant difference ($p<0.001$): 44.4% of women before the intervention in the intervention group never performed breast self-examination, and 68% never had a breast mammography or ultrasonography; 58.3% never had a breast examination by a doctor or midwife, and only 3.2% went to doctor or midwife regularly for breast examination. Also, 2.8% of women had a monthly breast self-examination, which increased to 70.8% after training, while 33.4% of women visited doctor or midwife for breast examination after training. Before training, only 8.3% stated a few months ago that they had mammography or ultrasonography, which increased to 50% after intervention.

Table 1. Frequency distribution of variables in the control and intervention groups

Variable	Most frequency	Intervention	Control
Marital status	Married	93%	94.4%
Education	High school diploma	31.94%	33.3%
Housing status	Personal	68%	53%
Income	More than 800,000 Tomans	30.5%	40.2%
Job	Housewife	94.6%	84.4%
Spouse job	Self-employed	45.8%	61.1%
Family life	With spouse and children	73.6%	77.7%

Table 2. Average scores of study variables of intervention and control groups before and after intervention

HBM Structures	Intervention		Control		*p*-value (2 months after intervention)
	Before	After	Before	After	
Awareness	16.1±7.32	27.7±5.56	16.7±6.84	16.1±6.42	$p<0.001$
Perceived Susceptibility	33.15±4.96	36.98±2.54	33.94±4.01	35.87±4.11	$p<0.05$
Perceived severity	12.62±3.69	12.27±3.48	13.87±3.17	13.87±3.14	$P<0.058$
Perceived benefits before	5.38±1.64	5.40±1.47	4.90±1.48	4.93±1.48	$p<0.058$
Perceived barriers	31.83±4.73	32.31±2.76	31.87±3.81	31.72±3.73	$p<0.278$
Practice guide	14.02±3.41	14.94±3.89	13.83±3.45	15.00±3.84	$p<0.057$
Performance self-examination	20.97±2.88	23.84±2.85	24.07±2.85	23.91±2.87	$p<0.001$

4. Discussion

This study was conducted on 144 women who were referred to health care centers. The average age in the intervention group and control group was 38.5 and 39.44, respectively, and both groups are similar. Results show that women required knowledge for breast self-examination, as the majority of women had no idea how to do it. The present study showed that knowledge of women before training in the intervention group was at minimum level, and after training the average level of knowledge significantly increased. Also, the knowledge obtained in both groups before the intervention can be attributed to television and health care workers. The significant difference after the training intervention between the knowledge scores of both groups could be attributed to informing women in training classes, which greatly improved the knowledge regarding breast self-examination. According to the researchers' observations on the incidence of breast cancer and by considering the adverse effects of a mastectomy on women's physical and mental health, this disease needs to be controlled in early steps, which would not be possible unless teaching the simple methods for early detection of disease such as breast self-examination, which is one of the most effective and easiest methods of breast cancer screening. Certainly evaluating their knowledge of how to perform self-examination properly is necessary before it can be effective.

Women's belief is certainly one of the effective factors in regards to properly performing breast self-examination. Numerous studies have confirmed the effect of planned training interventions based on the awareness and knowledge of people on health issues based on the health belief model constructs (10). Health belief model constructs and increase of perceived susceptibility average score after intervention represents the positive effect of

training on women's perceptions of breast disease complications. Therefore, it is clear that training with an emphasis on women's knowledge and perceived susceptibility construct convinced women to perform breast self-examination until they find themselves responsible for monthly breast self-examination and concluded that they are also susceptible to diseases such as breast cancer, so they neglected breast self-examination less. The study showed that the performance of women is low, and after the intervention there is a significant difference in the intervention group that a showed a positive effect of training on women performance and improving breast self-examination behavior. A study in women showed that only 17% regularly performed breast self-examination, and the most important reason for neglecting breast self-examination is lack of knowledge and awareness to do breast self-examination. Montazeri et al. also found that training programs to improve knowledge of women is essential and primary health care for improving their knowledge on breast care. Encouraging women to report abnormal changes in the breast to a doctor should be considered (16). Choudhry et al. on South Asian women showed that 12% of samples monthly perform breast self-examination (17). The results were in agreement with research corresponding to the increased perceived susceptibility in protective behaviors in the phenomenon of dust (18). Pinto suggests that the advertising about diabetic patients should have specific concentration on perceived susceptibility as a basic important tool (19). Before the training intervention, independent-samples t-test showed that there is a significant difference between the average score of perceived severity in intervention and control group, but after intervention no significant difference was observed, which can be attributed to women's beliefs about benign or malignant breast diseases and accepting the reality of death caused by breast cancer before intervention; no significant difference was observed between both groups in terms of perceived severity. Today the perceived severity of women according to media information or diseases of friends and relatives is in a favorable condition; however, it could not cause favorable performance, and no significant change was observed in perceived severity score. The results are in agreement with the results of Sahraei et al.'s study about predictive factors of the breast self-examination health control axis, which shows no relationship between perceived severity and behavior internal control axis (20). Nao also noted that perceived severity is often the weakest predictive factor in the health belief model (21). The results show significant difference between average score of perceived benefits in intervention and control group before the intervention, and no significant difference was observed after intervention. It is important to note that women with knowledge of breast self-examination reap benefits such as low cost, simplicity, and the quick and effective role in early detection of breast cancer—but still neglect breast self-examination. It would appear that, if women note that breast self-examination is not time-consuming and costly, do not need to visit a doctor, and it is easy to do, it can be effective in improving the level of perceived benefits.

The results show that, with training, no significant change was obtained in perceived barriers score. Because women don't consider problems such as breast cancer fear, breast pain, permission of husband and relatives, lack of time, shame, difficulty, forgetting self-examination as barriers, no change was caused in barriers by training. It cannot be said that women have no barriers for breast self-examination, and the reason of neglecting it should be searched in other constructs. As Collin et al. stated, the use of benefits statements and perceived barriers using their own sentences can express better perception of the issue. No significant difference in construct of the practice guide confirms that the positive signs that women receive from their surroundings or internal environment have not been effective in their performance, as most of them received knowledge and information from health care workers and television. Sadler et al. found that only 41% of 82% of nurses who perform breast self-examination do it regularly and monthly. The authors also stated not performing breast self-examination is due to lack of adequate skills and, in most cases (92%) is due fear of detecting an abnormality in the breast (22). The strength of this study was design of the questionnaire by the researcher. One of limitations in this study was self-reporting of performance and the impossibility to direct measurement of performance in participants. Another limitation was that participants received information about the breast cancer screening in various ways, including mass media and friends during the study.

5. Conclusions

The result of study demonstrated that self-examination, using the health belief model with increase of the perceived susceptibility, could be effective in improving performance of breast self-examination. Therefore, the self-examination educational program based on the health belief model with an appropriate consultation for early detection of breast disease and decreasing the concerns for women about breast cancer was suggested. Conducting additional research of other screenings of breast cancer for at-risk women via the health belief model could be an appropriate method for future research on this topic.

Acknowledgments:
The authors would like to thank the International Branch of Shahid Beheshti University for supporting this study financially and the manager and professors of the Department of Midwifery at the School of Nursing and Midwifery for realizing the importance of a thesis. This article is obtained from a midwifery student thesis by Zeynab Asadi.

Conflict of Interest:
There is no conflict of interest to be declared.

Authors' contributions:
All authors contributed to this project and article equally. All authors read and approved the final manuscript.

References:

1) Mousavi SM, Gouya MM, Ramazani R, Davanlou M, Hajsadeghi N, Seddighi Z. Cancer incidence and mortality in Iran. Annals of Oncology. 2009; 20(3): 556-63. doi: 10.1093/annonc/mdn642.
2) Lacey JV Jr, Devesa SS, Brinton LA. Recent trends in breast cancer incidence and mortality. Environ Mol Mutagen. 2002; 39(2‐3): 82-8. doi: 10.1002/em.10062. PMID: 11921173.
3) Porter P. "Westernizing" women's risks? Breast cancer in lower-income countries. N Engl J Med. 2008; 358(3): 213-6. doi: 10.1056/NEJMp0708307. PMID: 18199859.
4) Lander ES, Linton LM, Birren B, Nusbaum C, Zody MC, Baldwin J, et al. Initial sequencing and analysis of the human genome. Nature. 2001; 409(6822): 860-921. doi: 10.1038/35057062. PMID: 11237011.
5) Coughlin SS, Ekwueme DU. Breast cancer as a global health concern. Cancer epidemiology. 2009; 33(5): 315-8. doi: 10.1016/j.canep.2009.10.003. PMID: 19896917.
6) Naghibi A, Shojaeezadeh D, Yazdani J, Montazeri A. Preventive behavior and risk factors of breast cancer in Iranian women: systematic review. Payesh J. 2015; 14(2): 181-91.
7) Salimi Pormehr S, Kariman N, Sheykhan Z, AlaviMajd H. Investigation of breast cancer screening tests performance and affecting factors in women referred to Ardebil's health and medical centers, 2009. J Ardabil Univ Med Sci. 2010; 10(4): 310-8.
8) Davari M, Yazdanpanah F, Aslani A, Hosseini M, Nazari AR, Mokarian F. The Direct Medical Costs of Breast Cancer in Iran; Analyzing the Patient's Level Data from a Cancer Specific Hospital in Isfahan. Int J Prev Med. 2013; 4(7): 748-54. PMID: 24049592, PMCID: PMC3775213.
9) Asif HM, Sultana S, Akhtar N, Rehman JU, Rehman RU. Prevalence, risk factors and disease knowledge of breast cancer in Pakistan. Asian Pac J Cancer Prev. 2014; 15(11): 4411-6. doi: 10.7314/APJCP.2014.15.11.4411. PMID: 24969861.
10) Hatefnia E, Niknami S, Mahmoudi M, Ghofranipour F, Lamyian M. The effects of health belief model education on knowledge, attitude and behavior of Tehran pharmaceutical industry employees regarding breast cancer and mammography. Journal of Kermanshah University of Medical Sciences. 2010; 14(1): 42-53.
11) Wang WL, Hsu SD, Wang JH, Huang LC, Hsu WL. Survey of breast cancer mammography screening behaviors in Eastern Taiwan based on a health belief model. Kaohsiung J Med Sci. 2014; 30(8): 422-7. doi: 10.1016/j.kjms.2014.04.007. PMID: 25002381.
12) Noroozi A, Jomand T, Tahmasebi R. Determinants of breast self-examination performance among Iranian women: an application of the health belief model. J Cancer Educ. 2011; 26(2): 365-74. doi: 10.1007/s13187-010-0158-y. PMID: 20859775.
13) Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the health belief model. Health Educ Q. 1988; 15(2): 175-83. doi: 10.1177/109019818801500203. PMID: 3378902.
14) Bourne PA, McGrowder DA, Holder-Nevins D. Public health behaviour-change intervention model for Jamaicans: Charting the Way forward in Public Health. Asian Journal of Medical Sciences. 2010; 2(2): 56-61.
15) Lee HY, Stange MJ, Ahluwalia JS. Breast Cancer Screening Behaviors among Korean American Immigrant Women Findings from the Health Belief Model. J Transcult Nurs. 2015; 26(5): 450-7. doi: 10.1177/1043659614526457. PMID: 24848345.
16) Montazeri A, Vahdaninia M, Harirchi I, Harirchi AM, Sajadian A, Khaleghi F, et al. Breast cancer in Iran: need for greater women awareness of warning signs and effective screening methods. Asia Pac Fam Med. 2008; 7(1): 6. doi: 10.1186/1447-056X-7-6. PMID: 19099595, PMCID: PMC2628874.
17) Choudhry UK, Srivastava R, Fitch MI. Breast cancer detection practices of South Asian women: Knowledge, attitudes and beliefs. Oncol Nurs Forum. 1998; 25(10): 1693-701. PMID: 9826837.

18) Doostifar K, Ramezankhani A, Zarandi SM, Marashi T, Shakeri N. An investigation on the effect of education based on health belief model on protective behaviors from dust particles in teachers in the City of Ahvaz. Pajoohandeh. 2013; 18(4): 159-66.
19) Alves da Silva ML, Martins A, Costa‐Pinto AR, Correlo VM, Sol P, Bhattacharya M, et al. Chondrogenic differentiation of human bone marrow mesenchymal stem cells in chitosan‐based scaffolds using a flow‐perfusion bioreactor. J Tissue Eng Regen Med. 2011; 5(9): 722-32. doi: 10.1002/term.372. PMID: 21953870.
20) Sahrraee A, Norozee A, Tahmasebi R. predictor factors of health locus of control for breast self-examination based on health belief model. Iranian quarterly journal of breast disease. 2013; 6(1(20)): 43-51.
21) Nau DP, Ried LD, Lipowski EE, Kimberlin C, Pendergast J. A perceived value model for explaining patients' intentions to continue use of pharmaceutical care services. Journal of Pharmaceutical Marketing & Management. 2001; 14(1): 63-80. doi: 10.3109/J058v14n01_03.
22) Sadler GR, Dhanjal SK, Shah NB, Shah RB, Ko C, Anghel M, et al. Asian Indian women: knowledge, attitudes and behaviors toward breast cancer early detection. Public Health Nurs. 2001; 18(5): 357-63. doi: 10.1046/j.1525-1446.2001.00357.x. PMID: 11559419.