RESEARCH COMMUNICATION

Effect of Health Belief Model and Health Promotion Model on Breast Cancer Early Diagnosis Behavior: A Systematic Review

Fatma Ersin*, Zuhal Bahar

Abstract

Breast cancer is an important public health problem on the grounds that it is frequently seen and it is a fatal disease. The objective of this systematic analysis is to indicate the effects of interventions performed by nurses by using the Health Belief Model (HBM) and Health Promotion Model (HPM) on the breast cancer early diagnosis behaviors and on the components of the Health Belief Model and Health Promotion Model. The reveiw was created in line with the Centre for Reviews and Dissemination guide dated 2009 (CRD) and developed by York University National Institute of Health Researches. Review was conducted by using PUBMED, OVID, EBSCO and COCHRANE databases. Six hundred seventy eight studies (PUBMED: 236, OVID: 162, EBSCO: 175, COCHRANE:105) were found in total at the end of the review. Abstracts and full texts of these six hundred seventy eight studies were evaluated in terms of inclusion and exclusion criteria and 9 studies were determined to meet the criteria. Samplings of the studies varied between ninety four and one thousand six hundred fifty five. It was detected in the studies that educations provided by taking the theories as basis became effective on the breast cancer early diagnosis behaviors. When the literature is examined, it is observed that the experimental researches which compare the concepts of Health Belief Model (HBM) and Health Promotion Model (HPM) preoperatively and postoperatively and show the effect of these concepts on education and are conducted by nurses are limited in number. Randomized controlled studies which compare HBM and HPM concepts preoperatively and postoperatively and show the efficiency of the interventions can be useful in evaluating the efficiency of the interventions.

Keywords: Health belief model - health promotion model - breast cancer - nursing

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Introduction

Breast cancer is an important public health problem on the grounds that it is frequently seen and it is a fatal disease. Breast cancer constitutes the 23 % of all cancer cases observed in women throughout the world (Anderson and Jakesz, 2008). In Turkey, it was detected that breast cancer comes first among the cancer types seen in women with a ratio of 34,7 per one hundred thousand (http://www.saglik.gov.tr). The most effective method of protecting/promoting the health and reducing morbidity and mortality is early diagnosis. Studies conducted so far have shown that breast cancer early diagnosis behaviors of women are not sufficient (Makuc et al., 1999; Kalichman et al., 2000; Demirhan et al., 2002; Juon et al., 2002; Jirojwong and MacLennan, 2003; Beydağ and Karaoğlan, 2007; Dişçigil et al., 2007).

In a study conducted on Thai women by Jirojwong and MacLennan (2003), it was detected that 25 % of 145 women performed breast self-examination (BSE) regularly and that possibility of performing BSE increased in women with a sensitivity towards breast cancer. In their studies where the effect of BSE training on the breast examination was examined, Kalichman et al., (2000) stated that 85 % of women received a training as regards to the BSE beforehand but only 45 % of them performed breast examination regularly every month. Juon (2002) also stated that 93 % of women above the age of 60 has heard of mammography but only 63 % of them has undergone screening. Makuc et al. (1999) expressed that the ratio of low-income women to take mammography in the last one year was 48.4 %.

It was determined in the study conducted by Beydağ et al. (2007) in Turkey that 58 % of women did not have knowledge about this issue, 69.5 % of them did not perform BSE and 50 % of them did not make breast examination just as they did not know how to do. Demirhan et al., (2002) also stated that 42.7 % of women knew BSE but only 29.5 % of them performed it correctly. According to the results of the study conducted by Dişçigil et al., (2007), the ratio of women regularly performing the BSE every month was 17.9 %, the ratio of taking clinical breast examination was 42.7 % and the ratio of women taking mammography was 40.6 %.

These studies indicating the breast cancer early diagnosis behavior in women show that public health

*Public Health Nursing Department, Nursing Faculty, Dokuz Eylul University, Izmir, Turkey *For correspondence: fatmaersin1@gmail.com*

Table 1. The Health Belief Model and the Health Promotion Model and their Components

Health Belief Model	Health Promotion Model
Developed by Hochbaum and Rosenstock in early 1950s (Champion and Skinner, 2008).	Developed by Pender in 1987 revised in 1996 (Pender, 2006).
Components of the Models	
Individual Characteristics Socio-Demographic Factors	**Relationship with Previous Behavior** Personal Factors (biological, psychological, socio-cultural)
Perceptions Perceived Sensitivity Perceived Seriousness Perceived Benefit Perceived Barriers Perceived Self-Efficacy Perceived Health Motivation	**Behavior-Specific Cognition** Perceived Benefit Perceived Barriers Perceived Self-Efficacy Activity Related-Affect Interpersonal Influences Situational Influences **Behavioral Outcome** Immediate Competing Demands (low control) and preferences (high control) Commitment to a plan action
Action- Triggering Factors	**Health Promotion Behavior**

nurses play an important role in raising the awareness about the early diagnosis behaviors. Training programs supported by models are deemed effective in developing breast cancer early diagnosis behaviors in women. The most frequently used models towards breast cancer early diagnosis behaviors are Health Belief Model, Planned Behavior Theory, Transtheoretical model, Precede-Proceed Model, Social Learning Theory and Health Promotion Model (Glanz et al., 2008).

Of these models, the Health Belief Model (Table 1) is the most frequently used method in increasing the breast cancer early diagnosis behaviors. Even though the Health Promotion Model (Table 1) is not used in the breast cancer frequently, it has been stated in the studies conducted on exercise, sexually transmitted diseases and nutrition that it explains 75 % of the positive behavior changes (Pender, 2006).

The objective of this systematic review is to indicate the effects of interventions performed by nurses by using the Health Belief Model (HBM) and Health Promotion Model (HPM) on the breast cancer early diagnosis behaviors and on the components of the Health Belief Model and Health Promotion Model. In this analysis, answers were seeked for such questions as: "What is the effect of interventions made by using HBM and HPM on the breast cancer early diagnosis behaviors of women?, What is the effect of the applied interventions on the components of HPM?, What is the effect of applied interventions on the components of HPM?"

Materials and Methods

This study is a systematic review conducted in order to determine the effect of the interventions performed by using HBM and HPM on the breast cancer early diagnosis behaviors. This review was created in line with the Centre for Reviews and Dissemination guide dated 2009 (CRD) and developed by York University National Institute of Health Researches (Centre for Reviews and Dissemination, 2009). This guide includes information regarding the basic principles and methods of systematic reviews carried out in the field of healthcare and contains sections of starting to systematic review, reviewing protocol, literature rivew, selection of the studies, data analysis, writing report.

There was not a limitation of date in the literature review. It was reviewed by using PUBMED, OVID, EBSCO, COCHRANE databases. Review was conducted between December 2009 and September 2010 by using seven key words in English and three key words in Turkish. English key words were "Breast cancer and early detection", "Breast cancer and early diagnosis", "Mammography and breast cancer", "Clinic breast examination and breast cancer", "Self-examination and breast cancer", "Breast cancer and Health Belief Model", "Breast cancer and Health Promotion Model" while Turkish key words were "Breast cancer and early diagnosis methods", "Breast cancer and Health Belief Model", "Breast cancer and Health Promotion Model.

Criteria determining the inclusion of the reviewed studies in the sampling

Studies including breast cancer and early diagnosis methods; Studies including the Health Belief Model and Health Promotion Model; Studies conducted on women above the age of 40; Experimental and quasi-experimental studies. As for the exclusion criteria; Qualitative studies and descriptive studies. Six hundred seventy eight studies (PUBMED: 236 studies, OVID: 162 studies, EBSCO: 175, COHRANE: 105) were found at the end of the review. Abstracts and full texts of these six hundred seventy eight studies were evaluated in terms of inclusion and exclusion criteria and 9 studies were found to be consistent with the criteria (Figure 1).

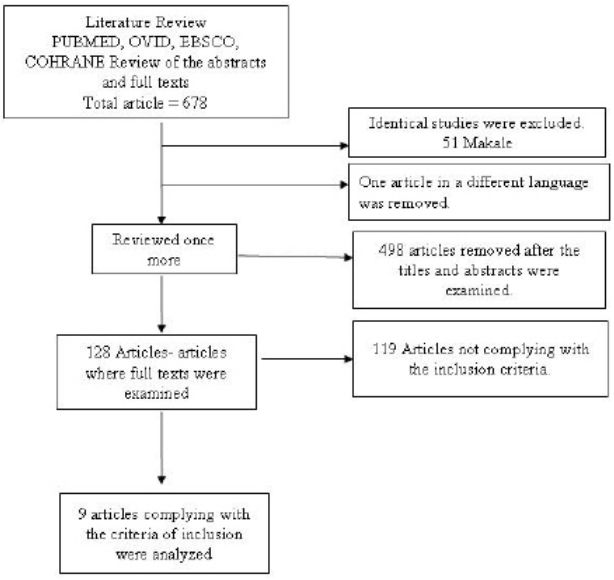

Table 1. Processes of Study Selection for the Present Systematic Review of Health Belief and Health Promotion Models

Findings

In this study, 9 research articles were examined. Findings obtained from these studies were presented in groups below: Studies which were examined were conducted between 1992-2007. Samplings of the studies were composed of women above the age of 40. When the numbers of samples were taken into consideration, the studies with the least samples were conducted by Oliver-Vazguez et al., (2002) and Tuong (2007) (ninety four women). The study carried out by Costanza et al., (2000) had the highest number of participants with one thousand six hundred fifty five.

Conceptual Framework / Theoretical Structure, Applied Intervention and Research Gorups

In the study conducted by Oliver-Vazguez et al., (2002) Health Belief Model was used in explaining the behaviors of women affecting their health and Preceed-Procede Model was used in planning the education to be provided. While training program was applied to the experimental grup, no intervention was performed on the control group. Training program was designed in order to develop a culturally appropriate health training regarding the breast cancer and early diagnosis for women above the age of 65, educate the healthcare personnel regarding the breast cancer screening conditions and the factors impeding the consistency and coordinate the minimum support services necessary for facilitating the access to clinical examination and mammography. Training was composed of three sessions lasting for 45-60 minutes. Women were provided with information as regards to the risk factors, recommended screening intervals and the social resources for screening.

In the study of Costanza et al. (2000) Health Belief Model was used in order to determine the barriers and the Transtheoretical Model was used so as to detect the consistency to mammography. There were three groups in the study. While training was provided to the experimental grups through consultancy via telephone (1 st group) and by the healthcare personnel (2 nd group), the control group was informed only by reminding through e-mail. Individuals providing consultancy in the study used a guide for determining the impediments regarding the health behavior and providing information about the impediments. Impediment specific telephone consultancies and remindings through e-mail were offered to women. Consultancy lasted for five minutes on average. A training calendar including the Clinical Breast Examination and mammography was also prepared for the training to be provided by the healthcare personnel. The objective of the training was to encourage women to take mammography and increase the number of women taking mammography. A five-hours course was organised for women who were provided with the training. Demonstration and practice skills took three hours of the course. Roleplays were performed by women and courses were organised free of charge in order to increase the participation. Women were called three times during the study.

In their studies, Seow et al. (1998) principally determined the impediments of women for not taking mammography through focus group interviews structured according to the Health Belief Model. The following three separate groups were included in the study: the group to whom reminding was sent only through mail (control group), the group to whom reminding and a training material were sent through mail within the scope of the project (experimental grup) and the group to whom both a reminding was made and a visit was paid at home (experimental grup). At least one relative of each women to whom a home visit was made was contacted. In the study, impediments of women for not taking mammography were determined principally through the focus group interviews structured according to the Health Belief Model. Training materials were designed in line with these results.

As for the study conducted by Champion et al. (2000a) based on the Health Blief Model (HBM) and Transtheoretical Model. Women were randomly assigned to an in-person counselling, or no counselling control group. Those randomized tor receive counselling received an individually tailored counselling protocel that included information about the woman's stage mammography adoption as well as information about susceptibility to breast cancer, benefits of breast cancer screening, and ways to decrease barriers to breast cancer screening. Information regarding breast cancer and appropriate screening intervals also were covered. For both the telephone and in-person counseling interventions, a graduate nurse research assistant systematically addressed each of the components of susceptibility, benefits, and barriers. Women assigned to the in-person group were counseled in an available room at their HMO (health maintenance organization). If a woman was in the precompletion stage, particular emphasis was placed on susceptibility and benefits to enable her to move from not thinking about having a mammogram to at least considering the possibility. For women in the contemplation stage, more emphasis was placed on the barriers to mammography that were identified by each woman. In addition, written materials were used to detail the information covered during counseling. The in-person counseling protocol used printed brochures and flip charts and was presented during the counseling intervention. For women who received telephone counseling, the printed materials were mailed prior to the telephone counselling appointment. Both the telephone intervention group and the in-person group received information on breast self-examination

As for the study conducted by Maxwell et al. (2003) Planned Behavior Theory, Precede Model and the Health Belief Model in particular were used. Training focused on the breast cancer screening information and increasing the perceived sensitivity. Firstly, impediments perceived by women were determined. Moreover, the individuals who would give the training were informed about the impediments perceived by the participants and the probable answers to these impediments. Experiment and control groups were selected in a randomized manner. Breast cancer module was applied to the experimental grup and it was about the knowledges and attitudes of women on the breast cancer. However, physical activity module was applied to the control group. Informations regarding the physical activity were provided in this

module. Experimental grup was composed of 24 session groups and the control group was also composed of 24 session groups. There were 5-10 people in each session groupon average. Sessions lasted for 60-90 minutes.

In the study conducted by Champion et al. (2000b) the Health Belief Model and Transtheoretical Model formed the theoretical structure. Firstly, nurse research assistants who would give the training were made to watch intensive training films lasting for two days and they were provided with manuals. Prior to the study, messages structured according to the Health Belief Model were sent to the women. Then, the experiment and control groups were determined. No intervention was applied on the control group. Interviews were planned in order to determine the beliefs of women included in the experimental grup regarding the breast cancer. To this end, firstly an associate researcher got in touch with the women for an interview at home and appointments were made with women. Written messages were sent to women as regards to the perceived sensitivity, impediments and benefits. In the second phase, data were collected from the experiment and control groups as regards to the breast cancer beliefs and the socio-demographic properties. About one year later, interviews were made with the women at home as regards to their mammography behaviors and beliefs. Besides, the associate researcher organised meetings in order to talk with the women every month.

In the study of Rımer et al. (1992) the Health Belief Model ans Social Learning Theory were included in the theoretical structure. Inverventions directed to the perceived sensitivity and impediments were structured by taking the Health Belief Model as basis. Furthermore, the Social Learning Theory was used as guide in developing the interventions. Especially, setting a role model was accepted as the main strategy in the mammography motivation. Focus point of the interventions was to ensure women to display mammography behaviors both through the social environment and by themselves. More than one interventions were applied to the experimental grup. E-mails encouraging the participation were sent to each woman, training program aimed at the importance of mammography was explained through letters and then, training sessions were organised by the researcher and home visits were made with mobile mammograms. Videos and written materials were also included in the training sessions. Some points were emphasized in the videos and the written materials. The neccesity of mammography for old women, informations including the questions of women regarding the mammography and the fact that mammography can detect breast cancer at early stages and taking mammography is not difficult were only several of these points. Women were given bags to encourage them, they were offered cold beverages and group discussions took place. Any intervention on the control group was specified in the study.

In their experimental study, Tuong (2007) used the Health Belief Model and the Transcultural Nursing Theory in forming the conceptual framework. Experiment and control groups were selected randomly. A training was given to the experimental grup about the breast cancer and BSE. Breast cancer knowledge, breast cancer health beliefs, BSE knowledge and practice and informations concerning the mammography and the clinical breast examination (CBE) activities were included in the content of the training. No intervention was applied to the control group.

In the study of Champion et al. (2003) Health Belief Model was used in order to determine the susceptibility, benefits, barriers and the Transtheoretical Model was used so as to detect the consistency to mammography. Study intervention was based on women's stage of mammography adoption and their individual beliefs. Those randomized to Groups 2, 3, 5, and 6 received counseling based on their initial responses to susceptibility, benefits, and barriers items, and considering their baseline stage of mammography adoption. To test the efficacy on mammography adherence of tailored interventions delivered by five different methods, i.e., telephone counseling, in-person counseling, physician letter, and combinations of telephone with letter and in-person with letter. Graduate nurse research assistants delivered the telephone and in-person counseling. Counselors were trained during a 2-day meeting and their counseling sessions were systematically monitored for quality control. If a woman was in the precontemplation stage, her counseling emphasized susceptibility and benefits. Messages related to perceived susceptibility or benefits were specific to the woman's responses. For women in the contemplation stage, barriers specifically listed by the individual were discussed and strategies to lessen barriers addressed. Prior research has indicated that precontemplators may need information on perceived risk and benefits whereas addressing barriers may be more important for contemplators. Printed, nontailored materials were developed specifically for the study and contained general messages related to susceptibility, benefits, and barriers. Both telephone and in-person counseling used the same protocol for tailoring messages to promote mammography screening.

Intervention Message

Susceptibilty: one woman in eight, 75% have no family history, risk increases with age. Benefits: discovered early, there is a 95% chance of cure, lumps are smaller when found by mammography, there are more treatment options when discovered early. Barriers: embarrassment, fear of cancer, lack of time, pain, radiation.

Measurement Tools and Follow-up Periods

Measurement tools used in the studies were indicated in the Table 1. In the study of Oliver-Vazguez et al., (2002) data were collected prior to the healthcare training sessions, during the session, after the session and 16-18 weeks later than the end of the session. In the study conducted by Champion et al., (2000a) the perceived sensitivity, perceived impediments and benefits were analyzed through a five-point likert type scale. A knowledge scale composed of 18 questions was used in evaluating the knowledge regarding the breast cancer and breast cancer screening. Minimum and maximum scores to be obtained from the scale were 0 and 18, respectively. Its Chronbach Alpha was 0.77. A question form developed

by the researchers was also used in order to determine the consistency to the mammography. As for the study of Maxwell et al., (2003) follow-ups were made through telephone 3-12 months later than the sessions. Knowledge and attitudes of women as regards to the breast cancer screening behavior were evaluated in the follow-ups. In their study, Champion et al. (2000b) conducted a follow-up after one year. In their study, Rımer et al., (1992) included previous breast cancer practices, benefits and impediments of screening, beliefs, informations of women regarding the breast cancer and their socio-demographic properties in the question form. A follow-up was realized three months later than the interview. In the experimental study carried out by Tuong (2007) the question form was applied prior to the training and three months later than the training. A follow-up was performed three months later than the intervention. In the study of Champion et al., (2003) Summated scales assessed HBM concepts of susceptibility (3 items), benefits (5 items), and barriers (11 items) by using five-point Likert responses. Information regarding scale development had been reported elsewhere. In this sample, Cronbach alpha for internal consistency ranged from 0.74 to 0.88. A follow-up was performed six months later than the intervention.

Results

In the study carried out by Oliver-Vazguez et al., (2002) a slight increase (4/22) was detected in the breast self-examination when the changes in the early diagnosis processes prior to the session and after 16-18 months were compared but a statistically significant difference was not found ($p > 0.01$). All women who had not taken mammography prior to the session took it thanks to the removal of the impediments and the support provided to them. however, the women who did not receive support did not take mammography. Besides, the ratio of demanding information from the healthcare personnel increased after the session.

In the randomised controlled study carried out by Costanza et al., (2000) the rate of women taking the clinical breast examination (CBE) increased in the experimental grup from 68 % prior to the training to 74 % following the training. However, an increase was not detected in the rate of women taking the mammography.

In the study carried out by Seow et al. (1998) 139 women out of 1500 (9,3 %) came to screening on their own. An increase of 7.6 % was observed following the intervention when compared to the rate prior to the intervention in the experimental grup to whom reminding and training material were sent. An increase of 7 % was detected in the control group when compared to the ratio prior to the intervention. An increase of 13.3 % was observed following the intervention in the second experimental grup to whom home visits were made. A significant difference was found between them when compared to the control group 1.90 (95 % GI 1.27 to 2.84). When it was compared to the second group, a significant difference of 1.75 was found (95 % GI 1.19 to 2.59).

In the study of Champion et al. (2000a) sensitivity perceived by women in the experimental grup prior to the intervention increased from 11.66 to 15.85 on average after the intervention in the group interviewed through telephone. As for the group with whom face-to-face interviews were made, it reached to 16.30 from 11.80 on average following the intervention. When the experimental grup was compared to the control group, the difference between the sensitivity levels measured prior to the intervention and following the intervention was found statistically significant ($F = 13.26$; $p = 0.001$). Benefits perceived by the women in the experimental grup prior to the intervention increased to 20.45 from 19.93 on average after the intervention in the group interviewed through telephone. However, benefits perceived by the women in the experimental grup prior to the intervention increased to 20.08 from 19.76 on average after the intervention in the group with whom face-to-face interviews were conducted. When the experimental grup was compared to the control group, the difference between the perceived benefits measured prior to the intervention and following the intervention was found statistically significant ($F = 3.91$; $p = 0.020$). Impediments perceived by the women prior to the intervention declined to 20.24 from 21.88 on average after the intervention in the group interviewed through telephone. However, impediments perceived by the women prior to the intervention decreased to 19.93 from 21.19 on average after the intervention in the group with whom face-to-face interviews were made. When the experimental grup was compared to the control group, the difference between the perceived impediments measured prior to the intervention and following the intervention was not found statistically significant ($F = 2.69$; $p = 0.068$). It was specified that an increase was also observed in the behavior of taking mammography following the intervention. A significant difference was not found between the groups in the phase of consistency to the mammography prior to the intervention ($X2 = 8.90$, $p = 0.346$). Consistency to the mammography in the control group following the intervention was 17 %, 30 % in the group interview through telephone and 33 % in the group with whom face-to-face interviews were made.

In the study of Maxwell et al. (2003) while the ratio of women to take mammography was 47 % prior to the intervention, it increased to 59 % following the intervention and the difference between these ratios was found as statistically significant ($p = 0.002$). Likewise, while the ratio of women taking mammography was 48 % prior to the intervention in the control group, it reached to 57 % following the intervention and a statistically significant difference was detected between them ($p = 0.030$). No difference was detected between the ratios of experiment and control groups measured in terms of taking mammography prior to the intervention and following the intervention ($p = 0.40$). Score increases of 9-12 % were observed in both groups in terms of screening ratios.

In the study carried out by Champion et al., (2000b) while the status of the experimental grup to come into action at the cognitive level associated with the consistency to the mammography was 59 % prior to the intervention, it reached to 75.7 % after the intervention. As for the control group, while it was 63.8 % prior to the intervention, it increased to 71.1 % following the intervention. After

the intervention, 50 % of the women in the experimental grup and 18.8 % of the women in the control group came into action.

Rımer et al. (1992) determined in their study that there was a significant difference (p = 0.002) between the experiment and control groups in terms of feeling good and the believing that mammography was unnecessary (p = 0.040) and in terms of feeling healthy and believing that mammography was unnecessary (p = 0.002). The frequency of taking mammography three months later than the first interview was found to be 45 % in the experimental grup and 12 % in the control group and the difference between these frequencies was determined to be statistically significant (p = 0.000). The cost of mammography reduced considerably both in the experiment and control groups thanks to the mobile mammography. The frequency of women in the experimental grup to take mammography generally increased to 53 % from 35 % in the study. This ratio increased to 19 % from 6 % in the control group. While the ratio of women who did not attend the training regularly to take mammography increased to 41 % from 22 %, this ratio reached to 86 % from 75 % in women attending the training regularly.

In the experimental study conducted by Tuong (2007), a significant difference was found between two groups in terms of two subdimensions (perceived seriousness, perceived benefit) of the Health Belief Model. It was also stated that seriousness and benefit perceptions of women regarding the screening were higher following the intervention when compared to the levels prior to the intervention. BSE knowledge (p = 0.005) and the status of performing BSE (p = 0.009) increased following the intervention. No significant relationship was found with the clinical breast examination and mammography. However, 80 % of the women stated that they would make appointment for mammography.

In the study of Champion et al. (2003) All five interventions increased mammography adherence significantly relative to usual care (odds ratios, 1.93 to 3.55) at 6 months post intervention. The combination of in-person with physician letter was significantly more effective than telephone alone or letter alone. Women thinking about getting a mammogram at baseline were more likely to be adherent by 6 months; even those in usual care achieved 48% adherence compared with 50–70% in the intervention groups. In contrast, women not thinking about getting a mammogram needed the interventions to increase their adherence from 13% to over 30%.

As a conclusion, there is a limited number of studies conducted on women above the age of 40 by taking the Health Belief Model as basis. Furthermore, there were only two studies where the Health Promotion Model designed for the breast cancer early diagnosis behaviors was used (Johnson, 1998; Taylor, 1998). These studies were not included in the sampling as they were inconsistent with the criteria of inclusion.

Discussion

Five of the eight studies included in the review were randomized controlled studies while three of them were experimental studies. Experimental studies conducted through the Health Promotion Model and consistent with the criteria of inclusion could not be found.

Interventions applied in the studies became effective in developing and maintaining the breast cancer early diagnosis behaviors in women. There are various triggering factors ensuring women to develop and maintain the breast cancer early diagnosis behaviors. Triggering factors include the use of training and reminders related to the issue (reminding letters, reminding through telephone, reminding via e-mail, informative brochures, home visits, combined interventions and media etc.) (Oliver-Vazguez et al., 2002; Kwok et al., 2005; Bonfil et al., 2009).

Interventions applied in the reviewed studies include telephone consultancy, demonstration, role plays (Champion et al., 2000a; Costanza et al., 2000), sending messages via e-mail (Rımer et al., 1992; Champion et al., 2000b), home visit (Seow et al., 1998) and training (Rımer et al., 1992; Costanza et al., 2000; Oliver-Vazguez et al., 2002; Maxwell et al., 2003; Tuong 2007) in particular. The most important intervention directed to the breast cancer early diagnosis behaviors is usually training on the issue. Thus, prevention of breast cancer in women at early stages will only be possibly by informing all the women with healthcare trainings and implementing the screening programs. It was detected in the studies conducted by using the Health Belief Model that individuals developed positive health behaviors (Champion et al., 2000a; Oliver-Vazquez et al., 2002; Pender, 2006; Nahcivan and Seçginli 2007) after they were informed about the issue and resorted to early diagnosis behaviors (BSE, CBE and mammography) (Rımer et al., 1992; Champion et al., 2000a; Constanza et al., 2000; Oliver-Vazguez et al., 2002; Maxwell et al., 2003; Paskett et al., 2006; Beydağ and Karaoğlan 2007; Gölbaşı et al., 2007; Tuong, 2007). However, another important point is that only training will not be effective in developing the breast cancer early diagnosis behaviors alone (Oliver-Vazquez et al., 2002). There are several key steps of developing the early diagnosis behaviors in women. Firstly, the external factors impeding women to realize these behaviors should be determined, then training programs should be designed accordingly and these trainings should be supported by the reminders (Bonfil et al., 2009; Oliver-Vazquez et al., 2002). It was expressed in the study of Oliver-Vazquez et al., (2002) that providing information did not yield consistency to the screening in women and that facilities related to appointments and transport would play an important role in developing the breast cancer early diagnosis behaviors. It was also stated in this study that the combined triggering strategies (reminders) and in particular the trainings provided by the healthcare personnel (nurse, midwife etc.) would be more effective than individual strategies (Rımer et al., 1992; Costanza et al., 2000; Oliver-Vazquez et al., 2002).

Public health nurses contribute to the promotion of early diagnosis behaviors by providing training and using the triggering factors. Thus, nurses should know the triggering factors and use them in practice as they are key individuals to develop the early diagnosis behaviors.

The effect of the interventions performed in two

studies on the components of the Health Belief Model (perceived benefit, sensitivity, impediment, seriousness) was assessed and it was observed that the intervention made by the nurses became effective on the components of the Health Belief Model (Champion et al., 2000a; Tuong, 2007). How individuals feel themselves in terms of preventing the diseases and maintaining the health is also of great importance in realisation of the expected health behavior. These perceptions reflect the willingness of the individual regarding the primary protection. Therefore, the individuals may be informed about the attitudes, behaviors related to the healthcare and benefits of performing the early diagnosis behaviors by indicating the effects of implementing and maintaining the early diagnosis behaviors on the length and quality of life. In this manner, it becomes more likely for the individuals to check their health themselves (Hochbaum, 1958; Glanz et al., 2008).

It was observed in the studies conducted so far that training plays an important role in increasing the sensitivity, seriousness and benefit perceptions. Besides, when the relationship between these perceptions and the behavior is taken into account, the possibility of realising this behavior increases as the seriousness and benefit perceptions increase (Champion et al 2000a; Tuong, 2007). Studies support the argument that training may increase the sensitivity, seriousness and benefit perceptions while they also indicate that more studies are necessary in this field.

It is clear that trainings provided in a study included in the systematic review play a key role in eliminating the factors impeding the realisation of breast cancer early diagnosis behaviors. Psychological, structural, organisational and socio-cultural factors are effective in directing women towards the breast cancer early diagnosis behavior and their breast screening rates (Remenninck, 2006). There are many studies whose objectives were to determine the impediments regarding the breast cancer early diagnosis behaviors. Nevertheless, interventions conducted by nurses and aiming to eliminate the impediments are limited in number. It has been observed in the studies that the possibility of realising the breast cancer early diagnosis behaviors increase as the self-efficacy and health motivation perceptions included in the Health Belief Model (Champion and Scott 1997).

Pender stated that impediment and benefit perceptions included in the model are among the most important concepts in explaining the health protection behaviors or estimating the behavior but the perceived seriousness and sensitivity were determinative in explaining the health protection behaviors (Pender, 2006). There were only two studies that were conducted by using the Health Promotion Model directed at the breast cancer early diagnosis behaviors (Taylor, 1998; Johnson, 1998). Taylor's (1998) study was excluded from the sampling as it did not include women above the age of 40 and Johnson's study (1998) was not included in the sampling as it was descriptive. It was observed in the study of Taylor (1998) that interventions applied by using the Health Promotion Model aimed at the breast cancer early diagnosis behaviors are effective on the behavior. However, the limited number of these studies requires more nursing studies in order to prove their effects on the behavior.

In conclusion, when the literature was examined, it was observed that the experimental studies that compared the concepts of Health Belief Model before and after the training, indicated the effect of the interventions on these concepts and on the early diagnosis behaviors and were conducted by nurses were limited in number. Randomized controlled studies that compared the concepts of Health Belief Model before and after the intervention, indicated the efficiency of the interventions and would be applied by the nurses may be useful in order to examine the efficiency of the interventions.

There were two studies conducted by using the Health Promotion Model directed at the breast cancer early diagnosis behaviors. However, these studies did not comply with the criteria of inclusion. Studies related to HPM were usually about nutrition, exercise and substance abuse and positive behavior changes were detected at the end of the studies. Thus, experimental studies to be carried out by nurses by taking the Health Promotion Model as basis may be effective in developing early diagnosis behaviors. Furthermore, no study was found where the Health Promotion Model and Health Belief Model were used together. It is stated in the literature that the combined use of the models is important in planning the training and the behavior changes. Nursing researches to be conducted by using the Health Promotion Model and the Health Belief Model jointly are thought to become effective in planning and implementing the nursing interventions to be applied for behavior changes in women.

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