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A review of studies conducted on efficacy of health educational interventions to correct women's behavior in performing breast self-examination

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ABSTRACT

Introduction: Many training programs have been conducted, aiming to encourage women to perform breast self-examination for early detection of breast cancer. This study aimed to review studies performed on efficacy of educational interventions to correct women's behavior in breast self-examination.

Methods: Through systematic search of MEDLINE and ISI Web of Science databanks to retrieve titles and abstracts of articles containing results of educational interventions associated with women's breast self-examination, the articles that focused on determining efficacy of educational interventions were selected. Eventually, results obtained from reviewing full text of 19 selected articles were analyzed.

Results: The majority of educational programs were designed for training skills, and most trainers were healthcare staff, and in some cases, educators were made up of peers and families of breast cancer patients. A huge diversity was observed in studies in terms of demographics, such as age, race, education, and occupation, and in some cases, first degree relatives of breast cancer patients were educated as the most important at-risk group.

Conclusion: Teaching breast self-examination, with regard to knowledge, attitude, and behavior, plays an essential role in increasing cases of early detection and treatment of breast cancer. More effective education is provided by nurses and other medical staff compared to doctors. Attention to finding a suitable location for education, including healthcare centers and workplace, attributes to success.

Keywords: breast cancer, breast self-examination, health education, prevention.

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Introduction

Breast cancer is the most common cancer and the leading cause of death among women. Increasing and high incidence rates of this disease, and difficulty in treating it in advanced stages, imposes a huge burden on different countries' health systems. Thus, to make early diagnosis possible, health systems have turned to various strategies. Regardless of rates of efficacy of these measures, they will impose considerable costs on the health system at national level, and it is not clear if the expenses of performing them are less than the costs of not performing them. Given economical dimensions of these measures, another side of policy making in relation to containment of burden of breast cancer is directed toward health education measures, including empowerment of women for breast screening measures. High prevalence of breast cancer, and the fact that in more 70% of diagnosed cases, no known risk factor has been found,¹ is indicative of the importance of early detection and timely treatment of the disease. Currently, a variety of breast cancer screening methods are used for its early diagnosis including clinical breast examination, mammography, and breast self-examination.¹ Studies indicate that nearly one third of breast cancers occur in women younger than 50 years, which is an uncommon age for clinical breast examination, and an age in which mammography is ineffective.¹ Also cost of these procedures, incurred by the health system is not very low. Thus, given all these points, regular and correct breast examination by women themselves can be considered an inexpensive and available method. Amid, the need is felt for empowering women for breast self-examination and use of educational interventions to promote such behaviors among women. Health education plays an important role in institutionalization of these behaviors among women because it attempts to change lifestyle by incorporating different views, and helps people, families and communities in decision making for health issues.²

For many years, health experts have attempted to design, implement, and evaluate health education programs in order to change and correct unhealthy behaviors, or promote new behaviors, and have paid a special attention to breast self-examination as a preventive behavior. In this study, we attempted to reach applied results and to

teach such behaviors across the country, through review of previous studies on training behavior in women to welcome breast self-examination as a new health behavior, and through analysis of related educational components of these studies, evaluation and analysis of their efficacy, and classification of results.

Materials and Methods

This study focused on systematic search of two databanks: PubMed and ISI Web of Science. When searching the PubMed, we found that administrators of MeSH had already defined a heading to facilitate search in this area. Thus, the same MeSH entity (Breast Self-Examination) was used, which led to finding 398 results in PubMed. ISI Web of Science did not have similar facilitating glossary, so another strategy was used, in which all 596 articles containing the terms "Exam" and "Breast" in their titles were retrieved.

Retrieved results from the two databanks were compared and duplicates were discarded. Because the searches were not restricted (for example, for field, year, language, country, or study location, etc), a large number of articles were found, and their abstracts (that had been prepared by End Note and Reference Manager software programs) were entered into the data bank of the article. Then, with the aim to separate and eliminate irrelevant results, further limited search was conducted in this databank. Irrelevant abstracts were removed from databank. Next, through review of abstracts of the remaining articles, initially 100 articles, with more relevance were selected. Then, through more detailed review, eventually 19 articles with possibility of extracting main components of an educational relationship were used for final analysis.

To analyze finalized articles (mostly randomized or controlled clinical trials), main components of an educational relationship were extracted including target population, type of intervention, comparison, and results of educational measures. Then, for better understanding and easier analysis, results were tabulated. Two points are worth noting: in some finalized references, different aspects of a single article were presented as separate articles. However, despite this knowledge, due to different outcomes intended by researchers, all these articles were considered. Second, during the search, a non-English ar-

ticle (Spanish) was found, and given its valuable subject, and since translated version could not be found, its abstract was used.

Results

It can be seen that educational programs, aiming to increase breast self-examination can be analyzed along certain axes:

1. Educational content: Results show that in most cases, educational programs are in training form, and educate learners through regular practice of this behavior, which can be justified, since breast self examination is a skill, and in addition to gaining theoretical knowledge, skill is also required.

2. Type of interventions: To prove efficacy of educational interventions, most studies have used quasi-experimental, before-after design, and in some cases, by selecting an appropriate control group, randomized clinical trial has been considered, in order to explain the outcomes.

3. Trainers: In most case, trainers were healthcare staff, including physicians and non-physicians (especially nurses). In some cases, outcomes of education by breast cancer patients' peers and relatives were also examined by researchers.

4. Learners: The diversity in terms of learner groups' characteristics in these studies indicated importance of attention to this behavior in every different group in terms of age, race, education, and occupation. While, in some cases first degree relatives of breast cancer patients were trained as important at-risk groups.

5. Educational intervention outcomes: Diversity in expected outcomes of interventions included raising learners' knowledge level (in breast cancer, risk factors, symptoms, and screening methods), correct and skillful practice of breast self-examination technique (including proper depth of touch, and timing of search for mass), and ability to detect breast lump practiced on artificial breasts and own breast, and finally, institutionalization of this new behavior with appropriate frequency and interval has been recommended. **Table 1** presents categorized data relevant to this study.

Discussion and Conclusion

Summarizing and analyzing reviewed articles demonstrate the need for breast self-examination as an important breast cancer screening technique. Since this behavior is considered an innovation in many communities, accurate planning to develop this innovation and to make it welcomed by high risk groups is highly important. Many articles that examined the role of educational intervention in causing this behavior in women confirm this point.

Breast self-examination training will play an essential role in increasing the number of detected lumps and early treatment of breast cancer regarding knowledge (including transfer of information associated with breast cancer in general, risk factors, and screening methods), attitude (including correction of beliefs of women in the context of breast cancer, and necessity of performing breast self-examination), and behavioral (including skills, right frequency and accuracy in breast self-examination by women, ability to detect breast lumps on a model and on own breast, and finally, regular self examination). All reviewed articles have dealt at least with one of the above areas, and have shown the effects of educational intervention on that area.

Nurses and other medical staff are more effectively involved in teaching, compared to physicians like, gynecologists (for whom, lack of time is the greatest obstacle). Also, recently graduated medical staff and paramedics are more committed to the education than others.¹¹ However, results indicate that training by adolescent and young peer groups (forming personal identity) can be more effective, and can produce better outcomes.¹³

Attention to appropriate locations for breast self-examination education, including health centers and classes held in the workplace, is among reasons for success of educational programs.¹⁸ Education in official situations such as schools, universities, healthcare centers, and workplace, and also in non-official situations, like training peers and colleagues, have also been considered in these articles. However, another important non-official situation, education in households, has been much considered.

Use of combination intervention, including multi-media and print together with educational courses, and use of reminding and strengthening factors have been more

Table 1. Results of review study of articles.				
Reference	Target population	Type of educational intervention	Comparison	Educational intervention results
3	Danish women	Use of a formal educational program and implementation by healthcare staff	Knowledge, attitude, and behavior of women that had received formal BSE training compared to control group	Increased knowledge about how and when to examine, and how to deal with detected breast lump, and possibility of regular BSE, and use of more accurate technique in case group
4	Undergraduate female student in Turkey	Implementation of skills training program by peer groups	Assessment of knowledge and behavior of the subjects before and after intervention	A number of students that performed BSE had little knowledge of breast cancer, but their mean practical skills score was high
5	First degree relatives of breast cancer patients	Skills training program in health centers	Subjects were divided into two groups, and each group received specific trainings. Their BSE skills were tested at the onset of study and on three other occasions with 4 monthly intervals	Significant increase in BSE skills, frequency of practicing, confidence in the method, knowledge of breast cancer, understanding risks involved, in both methods
6	Housewives	BSE skills training given to three groups of: 1) only educational content, 2) practical training on artificial breast besides educational content, 3) practicing on their own breasts besides educational content	Examining level of BSE, frequency, and confidence in the BSE in diagnosis of breast cancer	Training did not much change their behavior, and no change was detected in frequency of self examination or in their confidence in this method
7	Ugandan women over 15 years old	Received BSE education in areas of knowledge, attitude, and behavior by healthcare staff from different clinics, including maternity health clinics, a before-after intervention was also conducted	Qualitative assessment of knowledge, attitude, and behavior of target women	After training, all participants recognized risk factors and could associate between them and the disease. Women's behavior improved and more than 90% of them could explain BSE procedure satisfactorily.
8	Women aged 25 to 64 years	Skills training program for both case and control groups	Comparison acquired skills by two groups, 2 months after training, and follow-up 4 months and one after	Detection of breast lump by the intervention group, was significantly higher in both follow-ups, but in the control group it had reduced, during training and after, and in follow-ups.
9	Women attending community health center	Teaching BSE to two separate groups of women: first group received a multi-media skills training program using a breast model and possibility of computer feedback (detection rate of lump), and the second group received an educational pamphlet from the National Cancer Center	BSE self-efficacy in two groups was compared straight after education, and 2 and 4 months later as well	First group showed higher self-efficacy in performing BSE compared to the second group. but 4 months later, this level had reduced

effective than one-dimensional interventions.²⁰ Attention

to design and implementation of self-taught programs in-

Continue table 1. Results of review study of articles.				
Reference	Target population	Type of educational intervention	Comparison	Educational intervention results
10	40- to 69-year-old women and a number of healthcare staff	A random selection of case group and a retrospective cohort over a 10-year period in terms of education or action to provide BSE education	Comparison of relationship between education and low age, clinical breast examinations, screening mammography, previous education, race, income, family history of breast cancer, estrogen administration, gender, and occupation of educators	There was an insignificant relationship between results of education and low age, number of clinical breast examinations, screening mammography, and previous education, and insignificant relationship between these results and race, income, family history of breast cancer, or administration of estrogen. The educator's gender had no relationship with the results. Nearly 68% of women had received BSE training at least once over the past 10 years, and level of their learning had increased during this period three times. It was more possible for training to be given by internal specialist and non-medical staff than by gynecologists. Recently graduated doctor trained more of their patients.
11	12- to 47-year-old Mexican women	Use of educational strategies based on the target group's beliefs, and dividing the target group into two groups, and educating one by general health nurses (using pamphlets and speeches), and the other group by breast cancer survivors (using slides and artificial breast)	Comparing results of the two methods with a third method using pamphlets and video tapes	All three strategies were effective. In all three methods, knowledge and ability to detect lumps were increased by 30%. By the end of program 3 to 4 out of 10 women were able to detect more than three lumps in their breasts. While at the beginning of the program 1 out of every 20 women were able to do the same.
12	High school female students	A quasi-experimental study with educational program, including: 50 minutes lecture and discussion using slides of breast cancer and BSE, and a video film to show correct technique	Assessment of group in terms of knowledge and intention to self examine and comparison of results with control group 5 to 6 weeks later	Case group scored higher than control, and their knowledge had lasted after 5 to 6 weeks. More cases of self-examination and intention to self-examine were reported by this group
13	Black women and Caucasian women older than 60 years of age	A quasi-experimental study using self-taught video packages, organized according to race and age of participants. Both groups were presented with knowledge associated with risk of breast cancer, screening, and self examination skills	Pretest and post-test results were compared with those in control group that had only received educational pamphlets	Breast cancer knowledge, ability to self-exam, and ability to detect lumps had increased in the case group

cluding video and audio tapes, as well as use of computer and Internet have achieved great effects in many societies.^{10,16}

Utilizing target women's belief in design and implementation of educational interventions will improve the effects of these interventions, and lead to a more lasting

Continue table 1. Results of review study of articles.				
Reference	Target population	Type of educational intervention	Comparison	Educational intervention results
14	Women over 60 years exposed to breast cancer risks	A package containing tape and printed educational materials, and a small model of breast lump to transfer BSE skills to women	Before and 30 days after educational intervention, skills to perform BSE and to detect lumps were assessed	and 30 days after educational intervention, skills to perform BSE and to detect lumps had significantly increased in this group
15	Black women with mean age of 71.6 years	Teaching the target group BSE skills using a self-taught video tape	Before and after education comparison of knowledge of breast cancer risks, screening, and BSE skills, and use of mammography	The video program, adjusted to age and race, was effective in raising knowledge and BSE skills
16	Women and men with no previous BSE experience	Participants were randomly divided into two groups. The effect of educational video tape in one group, and palpation aid in another were assessed	The two groups were compared in terms of ability to accurately detect lumps	Neither the video tape nor palpation method + video tape had affected their ability to detect lumps., and palpation method even reduced their ability
17	Women employed in car manufacturing industry	Target group was divided into two, and one received posted educational pamphlets, and the other received both posted pamphlets and participated in educational courses held at their workplace	Pretest and posttest forms were completed by both groups, and groups were compared in terms of intention to perform BSE, and confidence in the method to detect lumps	Educational pamphlets had somewhat affected behavior and intention to perform BSE, and combination with educational classes increased this effect. Confidence in BSE to detect lumps increased in both groups after intervention
18	Black women aged 20-40 years	First, components of educational program were extracted through a qualitative study and formation of focus groups, and then, by a quasi-experimental study, the effect of educational program was assessed in the two groups	Frequency of performance and skills of BSE (including technique and detection of lumps) before and after intervention was assessed in two groups	Although BSE skills had improved in both groups, frequency of performing these skills did not
19	A group of American women	Participating women were randomly divided into three groups, and underwent 3 different educational interventions: medical message alone, medical message and participation in BSE skills classes, and medical message and participation in BSE skills classes plus telephone contacts and postcards	Frequency and accuracy of performing BSE were assessed 6 months after intervention in person, and one year later on the phone	At the start of study, mean frequency of practicing BSE in all women was about 27%, and in the 6 months and one year follow-up a significant difference was observed between groups 1 and 2 in accuracy, and groups 2 and 3 in frequency.

behavior change. Since sometimes cultural beliefs impedes performing some educational methods in particular societies, in some studies, significant percentage of women refused to practice on their own breasts.^{7,19} Given the importance of preventive programs, in which self-care interventions for early diagnosis of diseases, has a special

place, and high incidence and prevalence rates of breast cancer in human societies, including in Iran, use of experiences gathered in previous studies is an undeniable necessity to promote this behavior among women exposed to the risk of breast cancer. Use of this type of intervention is more economical considering expenditure compared to

Continue table 1. Results of review study of articles.				
Reference	Target population	Type of educational intervention	Comparison	Educational intervention results
20	Young women	Use of a structured educational program to increase skill to detect depth of palpation and timing of examination for lumps	Comparison of skills to detect the right depth of palpation and timing of examination in target group before and after intervention	Education had a significant effect on both factors of depth of touch and timing of examination
21	A group of women	Prospective study of 4 groups of women: target group, control, belief, and belief plus practical interventions	One year after intervention, the 4 groups were compared, in terms of parameters as: self-report skill, skill in observer's view, and sensitivity (detection of lumps)	Practical intervention group compared to control, and belief/practical group, compared to control showed significant differences, and in detecting lumps, belief/practical group compared to practical group showed a significant increase
22	35- to 88-year-old women	A randomized prospective experimental study of effects of some educational interventions in the area of BSE by nurses, with one control and 3 intervention groups (belief intervention to change beliefs about BSE, information intervention in the form of interview in person, and information belief intervention)	Determination of difference between 4 groups in terms of frequency, skills, and detection of lumps	Control group scored poorly in all 3 parameters, and there was a significant difference in results of information belief intervention compared to the control group, in terms of frequency, skills, and detection of lumps

benefits, and can be considered by healthcare system of the country. Still, considering the necessity of using theories and models in modern educational interventions, and high efficacy of these types of interventions, compared to more traditional ones, review of efficacy of using behavioral models and theories in transfer of these behavioral skills can be examined in future studies.

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