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Address: Mashhad Nursing and Midwifery School, Ebn-e-Sina St., Mashhad, Iran
P.O.Box: 9137913199
Tel.: (098 51) 38591511-294
Fax: (098 51) 38539775
Email: EBCJ@mums.ac.ir

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Original Article

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Evaluation of the Effects of Breast Cancer Screening Training Based on the Systematic Comprehensive Health Education and Promotion Model on the Attitudes and Breast Self-examination Skills of Women

khadijeh Mirzaii[1], *Shadan Nessari Ashkezari[2], Talaat Khadivzadeh[3], Mohammad Taghi Shakeri[4]

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Abstract

Background: Improvement of attitudes toward breast cancer positively affects the screening behaviors of women. Imagery has been shown to have a positive impact on the screening behaviors of women.

Aim: This study aimed to investigate the effects of breast cancer screening training based on the systematic comprehensive health education and promotion (SHEP) model on the attitudes and breast self-examination skills of women.

Method: This quasi-experimental study was conducted at two urban healthcare centers of Mashhad, Iran in 2015. Participants were 120 women covered by these health centers, who received training on breast cancer screening based on the SHEP model. Intervention consisted of evaluation (literature review, topic selection), implementation (developing instruments, educator training, training of participants), and assessment (pretest-posttest). Data were collected using researcher-made questionnaires of attitude and breast self-examination (BSE) checklists. Data analysis was performed in SPSS version 20 using independent t-test and Mann-Whitney U test.

Results: In the intervention and control groups, 55 (91.7%) and 56 (93.3%) participants were married, respectively. Results of Mann-Whitney U test before intervention showed no significant differences between the groups regarding the mean scores of attitude and breast self-examination skills (P>0.05). After a four-week follow-up, independent t-test revealed a significant difference between the groups in terms of the mean score of attitude (P<0.001). Moreover, Mann-Whitney U test was indicative of a significant difference in the mean score of BSE between the experimental and control groups (P<0.001).

Implications for Practice: Considering the feasibility and applicability of the SHEP model for different age ranges, breast screening training based on this educational model could enhance the attitudes and performance of women in this regard.

Keywords: Breast self-examination (BSE), Breast cancer screening, Systematic comprehensive health education and promotion model, Attitude

1. Evidence Based Care Research Centre, Associated Professor of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
2. MS in Midwifery, Students Research Committee, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
3. Evidence Based Care Research Centre, Assistant Professor of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran
4. Professor of Biostatistics, Faculty of public health, Mashhad University of Medical Science, Mashhad, Iran

* Corresponding author, Email: shadan.nessari@yahoo.com

Introduction

Breast cancer is the most prevalent type of cancer in women across the world, and nearly one million new cases of breast cancer are diagnosed annually. According to statistics, 23% of newly diagnosed cancer cases and 14% of cancer-related deaths account for breast cancer (1). Incidence of this chronic disease is on the rise globally, while it has been reported to be the most common cause of cancer deaths in low- and middle-income countries (2).

Breast cancer is considered the most prevalent gynecologic cancer in Iran (3). Annual incidence rate of breast cancer in our country (age-standardized rate) is 27.4 cases per a 100,000 population (4). According to the literature, age range of breast cancer patients in Iran is 10 years lower than Western countries (5, 6). It is predicted that the annual incidence of breast cancer will become tripled among Iranian women by 2030 (7).

Breast is a symbol of femininity, and thought of losing one's breasts is unbelievable and hardly tolerated. In case of breast cancer diagnosis, reaction of women mostly reflects fear of body deformation, losing appeal, and even thanatophobia (8).

If untreated, breast cancer could cause numerous complications for patients and their families. However, treatment of this disease is possible through early diagnosis and immediate healthcare measures (9). Secondary prevention is of paramount importance in breast cancer patients in order to diagnose the disease at early stages and control disease progression. Screening tests are an inherent element of secondary prevention of breast cancer (10).

Today, raised awareness of women regarding breast cancer screening methods has increased the number of referrals to healthcare centers for receiving therapeutic measures (e.g., mammography) (8). However, lack of adequate knowledge regarding the risk factors and symptoms of breast cancer and benefits of related screening tests influences the interest of Iranian women in breast cancer screening methods (11, 12). Furthermore, attitude plays a pivotal role in the formation of preventive behaviors (13), and lack of positive outlook toward cancer leads to the inefficacy of treatment (14).

Patient education is essentially involved in improving the awareness, attitudes and behaviors toward breast cancer screening (15). Current training approaches in this regard are often implemented based on written input in the health system, which might not be comprehended by some patients (16).

Use of different media (e.g., imagery) has been confirmed as an effective technique to convey healthcare objectives (17). Undoubtedly, learned content based on educational materials containing imagery are committed to the long-term memory of individuals. In previous studies in this regard, various methods have been applied to positively transform patient attitudes (18).

Promoting the attitude of the society toward breast cancer largely influences the screening behaviors of women (19). On the other hand, culture and ethnicity are considered as major influential factors in health, which are critically involved in the formation of attitudes, beliefs, and social interactions; as such, cultural tendencies have a significant impact on the health system (20). The Breast Health Global Initiative (BHGI) focuses on educational and cultural values in promoting breast cancer screening in developing countries (21).

In some studies, training has been reported to have no significant effect on screening behaviors, which might be due to the replication of a study conducted in another country with different cultural inclinations regardless of the values of a specific target group (22). This highlights the need for the proper training of individuals on the culture and capabilities of a community (23). Accordingly, the systematic comprehensive health education and promotion (SHEP) model was developed with the purpose of increasing health literacy and mentoring peer health educators.

SHEP is an innovative developmental tool in the education and health promotion system, which was primarily based on the theory of "Knowledge Management". This doctrine consists of three main steps, including evaluation (literature review, research topic selection, preparation of educational content), implementation (developing visual training tools, educator training, training of target audience), and assessment (short-term, medium-term and long-term).

In the SHEP model, training packages are mostly presented through visual images (75%), which has been associated with two major strengths. In addition to receiving substantial visual training by the audience, imagery in this model allows health educators to employ the materials compatible with the education level and understanding of the audience. To date, public training packages have been developed for five major health concerns, including AIDS, diabetes, flu, cholera, and oral health.

Although multiple reports in various health centers across Iran are suggestive of the increased awareness of trainees toward the use of these educational packages (18), few studies have assessed the proper application of the SHEP model; the only study in this regard has been conducted by Soofizdeh et al. (2013). In the mentioned research, application of the SHEP model was evaluated in diabetes prevention and control, emphasizing on the efficacy of this educational instrument in changing the awareness and attitudes of the subjects (24).

Given the importance of the early diagnosis of breast cancer in the physical and mental health of women, as well as the critical role of peer health educators in promoting attitudes and breast self-examination skills of women, a proper educational intervention is required for the women covered by various health centers.

So far, no breast cancer screening training packages have been developed based on the SHEP model, and no research in our country has employed this educational tool. This study aimed to investigate the effects of breast cancer screening training based on the SHEP model on the attitudes and breast self-examination skills of women in Mashhad, Iran. It is hoped that our findings lay the grounds for designing effective educational programs in this regard.

Methods

This randomized quasi-experimental study was conducted on two groups of educators and target audience. Study population consisted of all the health volunteers and women covered by two urban health centers (Shahid Najafi and Ab-o-Barq) affiliated with healthcare center No. 1 of Mashhad, Iran in 2015.

Participants included 12 health volunteers and 120 women in the intervention and control health centers. Sample size formula was used for the comparison of two independent populations based on previous studies (25). Considering 80% test power, mean difference of 1.05, standard deviation of 1.75 and 2.1, and confidence level of 95%, sample size was determined at 52 subjects for the target audience in the intervention and control groups.

Due to possible sample attrition, final sample size was determined at 60 subjects per each group (total: 120 for both groups). To train the health volunteers (n=10), six participants were assigned to each group. To select the study setting, healthcare center No. 1 was first-rated in five healthcare centers of Mashhad since it covers a larger number of healthcare centers and has appropriate educational facilities and adequate space.

Afterwards, two urban health centers (Shahid Najafi and Ab-o-Barq) were selected as the research enviroment via convenience sampling and randomly assigned to the experimental and control groups. These health centers offer proper equipment and educational environments at an acceptable distance from each other in order to prevent information exchange during the study.

After selecting the healthcare centers, records of health volunteers and female patients were reviewed by the researchers in order to identify qualified individuals. Sampling was performed in two stages at both health centers (first on health volunteers, followed by the women). Simple random sampling without assignment and systematic random sampling were employed to select the health volunteers and women covered by these health centers, respectively.

Inclusion criteria for health volunteers were as follows: 1) minimum age of 20 years; 2) high school diploma; 3) active participation in the training sessions of the selected health centers for one year prior to the beginning of study; 4) completion of the preliminary training course of health volunteers and 5) willingness to participate in the study. For the final target audience, the following criteria were also considered: Iranian nationality, minimum age of 20 years at the time of study, basic reading and writing skills, active family records in the selected healthcare centers since the beginning of 2015, lack of participation in training programs similar to this study within the past six months, and willingness to participate in the study.

Exclusion criteria were unwillingness to participate in the study, failure to participate in the tests, incomplete responses in questionnaires, absence in training sessions, and participation in training sessions for less than 30 min.

Objectives of the study were explained to eligible participants, and they were asked to attend the selected health center on a specific day at the due time.

Data collection tools included a researcher-made questionnaire of attitude and breast self-examination (BSE) checklists, which were applied based on previous studies in this regard (3, 26, 27).

Researcher-made questionnaire of attitude consisted of two sections. The first part focused on demographic characteristics (14 items), including age, education level, occupation status, marital status, number of children, personal or family history of breast conditions, use of contraceptives, awareness of breast cancer screening methods and source of knowledge, self-examination behaviors, clinical breast examination, mammography, relationship with other breast cancer patients, and length of cooperation as a health volunteer.

The second section of this questionnaire measured attitude in terms of the relationship between attitude and breast cancer (8 items) and breast cancer screening methods (12 items). In total, the questionnaire of attitude was composed of 20 items, which were graded based on a five-point Likert scale (Strongly Agree, Agree, Do Not Know, Disagree, and Strongly Disagree) within a score range of 20-100.

Content validity of this questionnaire was confirmed by a panel of experts. After conducting a pilot study on 30 subjects, reliability of this questionnaire was also confirmed at the Cronbach's alpha coefficient of 0.70.

To evaluate the breast self-examination skills of the participants, we applied the BSE checklist in accordance with the study by Seville et al. (28). These checklists consist of 14 items to assess the self-examination skills of women in two positions of standing in front of the mirror and looking at the breasts (5 items) and lying down and feeling the breasts (9 items).

In this study, BSE checklists were completed by ticking the options (Yes/No) during the self-examination process while participants were asked to perform breast self-examination without clothes in front of the mirror in a private room. It is noteworthy that following the instructions in the predetermined order was necessary for obtaining scores in BSE. Completed steps in the examination were graded one score, and no point was allocated to incomplete stages or those without compliance with the predetermined stages.

Minimum and maximum scores in the BSE checklist were 0 and 14, respectively. To determine the validity of this scale, the checklists were translated from English to Persian, and each item was compared with recent references in order to approve their accuracy.

Finally, quality and quantity of BSE was assessed by eight faculty members of the university to make necessary modifications and prepare the final draft based on their comments.

Evaluator agreement was used to confirm the reliability of BSE in this study. Initially, performance of 30 participants was observed by the researcher, and the results were recorded by an expert midwife (master's degree) who had previously received training to calculate the scores and correlation coefficients. Finally, reliability of the BSE checklist was confirmed at the correlation coefficient of 0.98.

This study was conducted in two stages. In the first stage, a SHEP-based educational intervention was implemented in the form of workshops and two four-hour sessions (total: 8 h) for the health volunteers (n=12). In the first training session, pretest was administered using the questionnaire of attitude and BSE checklist.

Afterwards, education level and communication skills of the participants were reviewed, and the educational materials were presented in accordance with the prepared training packages. Contents of the training packages were as follows: a general explanation of breast structure, breast lumps and their features, risk factors and symptoms of breast cancer, breast screening methods, and breast self-examination.

Images and posters were incorporated in all the training contents. At the end of the first session of the workshop, training packages were distributed among the participants, and they were asked to practice accordingly during a one-week interval between the first and second sessions.

In the second session, health volunteers practiced the methods, and the educational content was presented by each health volunteer separately. Moreover, other volunteers evaluated the presentations by mentioning the strengths and weaknesses. Posttest was conducted at the end of the second session, and six health volunteers with the highest post-test scores were selected as peer health educators. Finally, six health volunteers were randomly allocated to the control health center in order to receive conventional training.

In the second stage of the study, health volunteers in control and experimental groups implemented one training session (1 h) on their target audience based on the SHEP model and conventional techniques, respectively. In this training session, target audience of each health volunteer included 10

women. In addition, pretest and posttest (immediate and four-week follow-up) were performed for the trained target audience in this phase.

Study protocol was approved by the Ethics Committee of Mashhad University of Medical Sciences. Participation in the study was voluntary, and written informed consent was obtained from all the participants. Furthermore, participants were assured of confidentiality terms regarding their personal and medical information.

Data analysis was performed in SPSS version 20 using Kolmogorov-Smirnov test and Lilliefors correction to determine the normality of demographic data. In addition, independent t-test and Mann-Whitney U test were applied to compare the mean scores between the experimental and control groups, and Friedman's test was used to compare the mean scores of pretest and posttest. Comparison of the two groups in terms of demographic variables was performed using Chi-square and Fisher's exact test, and P value of less than 0.05 was considered statistically significant.

Results

This study was conducted on 12 health volunteers (six health volunteers per each group) and 120 women covered by the healthcare centers of Mashhad (60 women in experimental and control groups) with no sample attrition.

At the beginning of the study, health volunteers in both groups were homogenous in terms of demographic characteristics with no significant differences in this regard (Table 2) (P>0.05). Mean length of collaboration in the health volunteers of the experimental and control groups was 5.6±4.4 and 6.6±3.7 years, respectively (P=0.68).

According to probability value of the Mann-Whitney U test, a significant difference was observed between the women of the experimental and control groups in terms of age distribution (P=0.05). Among these participants, 26 cases (43.3%) in the experimental group and 43 cases (71.7%) in the control group had prior knowledge of breast cancer screening techniques (P=0.002). Furthermore, 23 women (38.3%) in the experimental and control groups had a history of clinical breast examination, while 14 women (23.3%) in the intervention group and 10 cases (16.7%) in the control group had a history of mammography (P=0.36). Demographic variables of the women and health educators in the experimental and control groups are presented in tables 1 and 2, respectively.

In this study, mean score of total awareness in the health volunteers of the experimental and control groups was 20±1.2 and 22.5±2.5, respectively. Considering the probability value of independent t-test, both groups of heal volunteers were homogenous in terms of awareness at the beginning of the study (P=0.07).

In order to compare the mean scores of attitude in the women of the experimental and control groups at three different intervals (prior to training, immediately and one month after training), independent t-test was used for normal variables, and Mann-Whitney U test was applied in case of lack of normality of data. Due to the non-normal distribution of data, Friedman's test was used separately for the experimental and control groups (Table 3). At the beginning of the study, mean scores of both aspects of attitude were higher in the control group; however, the difference was not statistically significant (P=0.23).

Immediately and one month after the intervention, women of the experimental group had significantly higher attitude scores compared to the control group (P<0.001). In this regard, comparison of within-group changes was indicative of statistically significant changes in attitude (P<0.001).

According to the results of this study, mean scores of attitude increased in both aspects in women of the experimental group immediately and one month after the intervention. However, mean score of attitude toward breast cancer screening techniques decreased immediately and one month after the treatment in the control group. Regarding the aspect of attitude toward breast cancer, the mean scores were observed to increase immediately after the intervention, while they decreased one month after the study in the control group (Table 3).

In order to compare the mean scores of BSE in the women of the experimental and control groups in three stages (before intervention, immediately and one month after training), Mann-Whitney U test was used due to the non-normality of data. Moreover, considering the non-normal distribution of data in the experimental and control groups, we applied the Friedman's test separately.

With respect to breast self-examination skills, mean scores of BSE were indicative of no significant difference between the experimental and control groups at the beginning of the study (P=0.69).

However, a significant increase was observed in the BSE scores of the experimental group immediately and one month after the educational intervention (P<0.001), which indicated significant differences between the groups (P<0.001) (Table 4).

Table 1. Comparison of demographic characteristics of women covered by health centers in experimental and control groups

Variable		Experimental group N (%)	Control group N (%)	Test results
Age (year)	20-30	8 (13.3)	16 (26.7)	*.05
	31-39	20 (33)	20 (33)	
	40-49	18 (13.3)	16 (26.7)	
	≥50	8 (13.3)	18 (13.3)	
Education level	Primary	13 (21.7)	6 (10)	*.40
	Secondary	10 (16.7)	12 (20)	
	High school	2 (3.3)	5 (8.3)	
	Diploma	21 (35.3)	23 (38.3)	
	Academic	14 (23.3)	14 (23.3)	
Occupation status	Housewife	50 (83.3)	55 (91.7)	**.14
	Employed	8 (13.3)	2 (3.3)	
	Other	2 (3.3)	3 (5)	
Marital status	Single	2 (3.3)	3 (5)	**.75
	Married	55 (91.7)	56 (93.3)	
	Widowed	3 (5)	2 (3.3)	
Personal history of breast conditions	No	51 (85)	48 (80)	**.47
	Yes	9 (15)	12 (20)	
Family history of breast conditions	No	49 (81.7)	54 (90)	***.19
	Yes	11 (18.3)	6 (10)	
Use of family planning methods	No	25 (41.7)	25 (41.7)	***.99
	Yes	35 (58.3)	35 (58.3)	
Relationship with other cancer patients	No	38 (63.3)	32 (53.3)	***.002
	Yes	22 (36.7)	28 (46.7)	

*Mann-Whitney U test; **Fisher's exact test; ***Chi-square

Table 2. Comparison of demographic characteristics of health volunteers in experimental and control groups

Variable		Experimental group N (%)	Control group N (%)	Test results
Age (year)	20-30	0	0	***.24
	31-39	2 (33.3)	3 (50)	
	40-49	1 (16.7)	3 (50)	
	≥50	3 (50)	0	
Education level	High school	2 (33.3)	0	***.45
	Diploma	4 (66.7)	5 (83.3)	
	Academic	0	1 (16.7)	
Clinical examination record	No	5 (83.3)	1 (16.7)	-
	Yes	5 (83.3)	1 (16.7)	
Mammography record	No	6 (100)	5 (83.3)	***.99
	Yes	0	1 (16.7)	
Personal history of breast conditions	No	5 (83.3)	6 (100)	***.99
	Yes	1 (16.7)	0	
Family history of breast conditions	No	6 (100)	6 (100)	-
	Yes	0	0	
Use of family planning methods	No	3 (50)	0	***.18
	Yes	3 (50)	6 (100)	
Breast self-examination history	No	1 (16.7)	0	***.99
	Yes	5 (83.3)	6 (100)	
Relationship with other cancer patients	No	2 (33.3)	3 (50)	***.99
	Yes	4 (66.7)	3 (50)	

*Mann-Whitney U test; **Exact test; ***Fisher's exact test

Table 3. Distribution of frequency and comparison of total mean scores of attitude aspects in experimental and control groups of women covered by healthcare centers

		Group		Test scores	Test results
		Experimental (n=60) Mean±SD	Control (n=60) Mean±SD		
Total score of attitude	At the beginning of study	24.7±4.9	25.9±2.8	Z=-1.19	*.23
	Immediately after intervention	37±2.2	26.5±3.46	Z=-9.43	**<0.001
	One month after intervention	37.9±1.8	24.1±3.61	Z=-.947	**<0.001
Friedman's test results		**<0.001	**<0.001		
Test score		Chi-square=103.82	Chi-square=58.65		
Attitude toward breast cancer	At the beginning of study	24.7±4.9	25.9±2.8	Z=-1.19	*.23
	Immediately after intervention	37±2.2	26.5±3.46	Z=-9.43	**<0.001
	One month after intervention	37.9±1.8	24.1±3.61	Z=-.947	**<0.001
Attitude toward breast cancer screening methods	At the beginning of study	35.5±5.4	36.7±5.1	Z=-.84	*.40
	Immediately after intervention	54.5±2.9	35.8±4.8	Z=-9.58	**<0.001
	One month after intervention	56.3±2.7	33.3±5	Z=-9.56	**<0.001
Test results		***<0.001	***<0.001		
Test scores		Chi-square=108.28	Chi-square=36.45		

*Mann-Whitney U test; **independent t-test; ***Friedman's test

Table 4. Comparison of mean scores of BSE in experimental and control groups of women covered by healthcare centers

BSE score	Group		Test scores	Mann-Whitney U test results
	Experimental (n=60) Mean±SD	Control (n=60) Mean±SD		
At the beginning of study	2±1.1.	2.3±1.2	-.4=Z	.691
Immediately after intervention	.9±13.3	2.9±.4	-9.59=Z	**<0.001
One month after intervention	1.1±13	2.4±3.6	-9.52=Z	**<0.001
Test scores	Chi-square=120	Chi-square=23.88		
Friedman's test results	**<0.001	**<0.001		

Discussion

The present study aimed to investigate the effect of breast cancer screening training based on the SHEP model on the attitudes and breast self-examination skills of women. Our findings indicated that mean scores of attitude were moderate in the majority of participants in the intervention and control groups.

This is consistent with the results of the following studies: Abedzadeh (2001) (Investigating knowledge, attitude and practice of women toward breast cancer and its screening in health centers of Kashan, Iran) (29), Mazloomy et al. (2005) (Effects of health education on knowledge, attitude and practice of female teachers toward breast cancer in intermediate schools of Yazd, Iran) (30), Kashfi et al. (2009) (Effects of education about breast self-examination on knowledge, attitude and practice of women in health clinics of Nourabad Mamasani, Iran) (31), and Banaeeyan et al. (2005) (A survey of

knowledge, attitude and practice toward breast cancer screening methods and it's effective factors in women referring to health centers of Boroujen, Iran) (32).

In the present study, mean scores of attitude in the experimental group had a significant increase after the intervention, while these scores were observed to reduce in the control group (Table 3). These findings are in line with the results obtained by Mazloomy et al. (2005) and Kashfi et al. (2009). Correspondingly, it could be inferred that educational interventions significantly enhance the attitudes of women toward breast cancer screening techniques.

In the current research, immediately and one month after the intervention, mean score of attitude in the experimental group was observed to increase (1.5 times compared to the control group), and the difference was statistically significant. Evidently, attitude is adopted through effective learning and positive perception of individuals, which requires relevant education in order to improve knowledge (33).

In the present study, since the health volunteers and women covered by the healthcare centers in both groups were homogenous in terms of demographic characteristics at the beginning of the study and received similar educational contents, discrepancies in the findings could be attributed to the type of intervention.

Educational intervention in the experimental group was performed based on the SHEP model, which is an integration of training through a waterfall methodology, along with the training of peer educators or health educators using visual instruments. In a research by Soofizadeh et al. (2013) entitled "Investigating the use of SHEP model in the prevention and control of diabetes in female students of Khoram Abad technical faculty", no significant difference was observed in the mean scores of attitude between the intervention and control groups prior to the educational intervention. However, the difference was considered significant in the experimental group after the intervention (24).

Despite the differences in study fields, results of the mentioned research are in congruence with our findings, confirming the efficacy of the SHEP educational model in the modification of attitude. This local model provides the required information in health education and promotion befitting to the public culture.

Culture and ethnicity are essentially involved in health promotion, as well as the formation of attitudes, beliefs, and interactions with the health system (20). Findings of the current study are consistent with the results obtained by Salehi et al. (2003) (Effects of the education of female health volunteers on the knowledge and attitude of urban population about mental health in Isfahan province, Iran).

In the mentioned study, no statistically significant difference was observed in the attitude scores prior to the intervention in the two groups; however, attitude scores of the experimental group significantly increased after the intervention. According to the results of the present study, training based on the waterfall model contributed to promoting positive attitudes toward breast cancer screening techniques in the participants (34).

In the current research, we incorporated the waterfall model into the SHEP model in order to improve public health education, promote public health, and transmit the educational concepts through various levels. Waterfall model is a coherent approach for the dissemination of information to employees of different ranks within the shortest time.

If educators perceive the sensitivity of education and developmental strategies, education based on the waterfall model could be largely effective in the enhancement of knowledge. On the other hand, training by the use of waterfall training model is cost-efficient and applicable for educating large populations within the shortest time (35).

In this regard, results of another study by Akbarzadeh et al. (2008) entitled "Comparison of the effects of teaching breast self-examination by peers and healthcare personel on the knowledge and attitude of students" are inconsistent with our findings.

In the mentioned study, the researchers investigated the efficiency of teaching by peer health educators in changing the attitudes of students and concluded that this type of training could improve the attitudes of students; however, this effect was not confirmed in the long run (25).

In the study by Akbarzadeh et al., lecture was the main educational instrument in both groups. Mean scores of students in the experimental group (education by peer health educators) were reported to be higher immediately after the intervention compared to the group trained by healthcare personnel. Therefore, this difference could be attributed to the higher efficiency of peer health educators in

improving short-term attitudes of students. Peer education makes a high-energy group problem-solving for the success of the program to be created(36).

Since peer health educators are also involved in the SHEP model to convey health messages, discrepancies in the aforementioned findings with regard to improving attitudes in the long term could be due to the applied research instruments. The SHEP model mainly employs visual tools to educate the audience. One of the main causes of misconceptions and false beliefs and attitudes is incorrect data processing (33).

Learning with reliance on imagery and visual aids is remarkably beneficial in committing the educational materials to the long-term memory. Meanwhile, efforts could be made for the positive alteration of the attitudes of the audience (18). With regard to breast self-examination skills, results of the present study indicated that the mean scores of BSE were relatively low in the experimental and control groups at the beginning of study, and no significant difference was observed between the groups.

These findings are in line with the results of the following studies: Abedzadeh (2001) (Investigating the knowledge, attitude and practice of women toward breast cancer and its screening in health centers of Kashan, Iran) (29), Mazloomy et al. (2005) (Effects of health education on the knowledge, attitude and practice of female teachers toward breast cancer in intermediate schools of Yazd, Iran) (30), and Kashfi et al. (2009) (Effects of education about breast self-examination on the knowledge, attitude and practice of women in health clinics of Nourabad Mamasani, Iran) (31).

According to the results of the current study, mean scores of BSE in both groups increased significantly after the intervention (Table 4).

Correspondingly, it could be inferred that educational interventions significantly enhance the self-examination skills and performance of women for breast cancer. Furthermore, healthcare training contributes to establishing appropriate behavioral patterns through providing the required knowledge and creating a positive attitude toward a certain behavior. With long-term follow-ups, tendencies of women for breast cancer screening could enhance concurrently (30).

In the present study, mean score of BSE in the women of the experimental group increased by three times compared to the control group immediately and one month after the intervention; this difference was considered statistically significant ($P<0.0001$).

In the current research, health volunteers and women covered by the healthcare centers in both groups were homogenous in terms of demographic characteristics at the beginning of the study, and educational contents were similar in both groups as well. Therefore, differences in the results could be attributed to the type of intervention, suggesting the educational efficacy of the SHEP model in improving breast self-examination skills.

These findings are consistent with the results of the following studies: Malak and Dicle (2007) (Assessment of the efficacy of a peer education model in teaching breast self-examination to university students) (37), Malak and Bektash (2008) (Effects of peer education, social support, and self-esteem on breast self-examination performance and knowledge level) (38), and Sevil et al. (2005) (Effects of a peer education project on breast self-examination in Izmir, Turkey) (28).

Furthermore, three studies have evaluated the efficacy of teaching by peer educators, which is similar to the strategy employed in the SHEP model. Women must begin breast self-examination at a young age. During this period, teaching by peers could enhance their skills in this regard, thereby helping them to consider breast cancer screening as an important approach in their life (37).

On the other hand, these findings are inconsistent with the study by Karayurt et al. (2007) entitled "Effects of peer and group education on the knowledge, beliefs and breast self-examination skills of university students in Turkey". In the mentioned research, BSE performance of students was compared between two groups after practical training on breast self-examination (2 h). According to the results, training by peer educators and group training were equally effective in the promotion of breast self-examination skills (39). Inconsistency between these results and our findings could be attributed to the differences of study populations, as in the study by Karayurt et al., subjects were university students, while we evaluated the women covered by healthcare centers. It is also noteworthy that use of imagery has proven highly effective in the healthcare training of individuals with lower education levels (40).

One of the strengths of the current study was random sampling. Moreover, conducting of the research at two separate healthcare centers with an acceptable distance prevented the possibility of information exchange, which improved the generalizability of findings.
On the other hand, selection of healthcare centers via convenience sampling was considered a limitation in our study. It is recommended that future studies in this regard apply random sampling for higher accuracy.

Implications for Practice
Considering the feasibility and applicability of the SHEP model for different age ranges, breast screening training based on this educational model could enhance the attitudes and performance of women in this regard. Although breast cancer is the most prevalent gynecologic cancer among Iranian women, many women do not perform breast cancer screening due to their false attitudes, which leads to the late diagnosis of this chronic disease. As such, provision of healthcare information befitting to the cultural understanding of Iranian women is of paramount importance for the early diagnosis and treatment of breast cancer.
According to the results of this study, attitude and performance of women improved after training based on the SHEP educational model in terms of breast cancer screening behaviors. This model is cost-efficient and could be applied without specialized equipment in different settings. Therefore, it is suggested that the SHEP model be employed as an educational instrument in healthcare and medical training centers.
This study was the first to use the SHEP educational model for breast cancer screening training in Iran, and other educational tools were developed for this specific research as well. The results of this study could be the start and Introduction Further research using this learning model is done.

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Conflict of interest
The authors declare that there is no conflict of interest.

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