An Educational Intervention Based on Health Belief Model for Improving Breast Self – Examination behavior Among Rural Women in Hai Duong, Vietnam

An Educational Intervention Based on Health Belief Model for Improving Breast Self – Examination behavior Among Rural Women in Hai Duong, Vietnam: A random Control Trial

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Abstract

Purpose: The goal of this study was to assess the effect of an educational intervention on breast self-examination (BES) behavior based on a Health Belief Model among Vietnamese women living in some rural areas of Hai Duong province.

Methodology: A random control trial study was conducted in two rural communes in Hai Duong province, Vietnam. Among 204 women participating in the study, they were allocated randomly into an experimental group (n=99) and a control group (n=105). An educational intervention was developed based on the Health Belief Model. An improving breast self-examination behavior of participants was assessed through doing BSE or not, frequency of BSE, and how to perform BSE.

Findings: At baseline, there were no differences between the two groups about general characteristics and breast self-examination percentage. After 3 months of the intervention, breast self-examination behavior including the rate of patients doing BSE, frequency of BSE, and performing BSE with good results in the intervention group were higher than those of the control group. (p<0.05).

Unique Contribution to Theory, Policy and Practice: Research results indicated that an educational program based on the Health Belief Model can improve breast self-examination behavior among rural women. Therefore, the educational intervention program based on the Health Belief Model should be expanded to women living in other rural areas of Vietnam.

Keyword: *Breast self-examination, Health Belief Model, Education interventions, rural women*

INTRODUCTION

Breast cancer is the most common type of cancer, and becoming the leading cause of cancer death in women in the world [1]. In Vietnam, breast cancer is also considered a serious problem that affects the health of many women because it is the most common cancer in Vietnamese women. On average, in 2020, more than 15 thousand women were diagnosed with new breast cancer and more than 6000 death cases were recorded [2]. In addition, most women with breast cancer are examined and detected at a late stage, so the prognosis is often very severe and the burden of treatment costs can be 40-50 times higher than the average family income [3]. Meanwhile, breast cancer is a completely curable cancer if it is detected early and treated promptly [4], and the cost of treatment in the early stage accounts for only 20% of that of treatment in the late stage [5].

It is expected that within 20 years (from 2020 to 2040), a Women Global Cancer Initiative belonging to the World Health Organization aims to prevent 2.5 million deaths from breast cancer in women, one of the three pillars to achieve this goal is to educate the community to raise awareness about breast cancer and the importance of early detection of breast cancer [6]. At the same time, the National Cancer Center of the United States (2018) recommends that women under the age of 20 years or older should perform breast self-examination (BES) every month and must be educated carefully about the technique by medical staff [13]. In Vietnam, the Ministry of Health has also introduced the breast self-examination method as a primary healthcare level in national guidelines on cancer prevention [9].

Breast self-examination is a safe technique, simple to perform, not time-consuming, and independent of medical staff. In particular, up to 90% of breast cancer cases are detected early through breast self-examination practice monthly [7],[10]. This technique is especially suitable for women in low-income rural areas and where medical response to breast cancer screening is limited [11]. Therefore, it is truly necessary to develop and replicate an educational program to improve women's breast self-examination practice [12].

Although, in the world, many countries have tested health education programs based on the Health Belief Model to improve the belief and practice of breast self-examination for women and achieved good results [13–16]. However, health beliefs are a factor influenced by personal characteristics and can be modified [17]. At the same time, behavior is formed and changed according to social, cultural, economic, and political influences [7]. Therefore, when applying this model and educational intervention to individuals with different cultures, languages, and health systems in different countries, communication methods and performance strategies must be considered to ensure effectiveness [18]. Until now we could not found any intervention study for evaluating the effectiveness of an educational intervention based on the Health Belief Model to improve breast self-examination practice for women in Vietnam, so that is the reason why we conducted this study.

Theory background

The Health Belief Model is one of the most important behaviors change models and is widely used to determine the relationship between health beliefs and health behaviors. Moreover, it is also one of the most appropriate health education and health promotion models widely used in many research on breast examination for women [19], [20].

The Health Belief Model focuses on two aspects. The first was threat perception which includes two main beliefs: perceived susceptibility to disease and severity level of disease. Second, it was behavioral appraisals that also included two distinct sets of beliefs: beliefs related to the benefits or effectiveness of the recommended health behavior, and other beliefs related to barriers to performing the behavior. Additionally, the model proposed that action signals could trigger health behaviors [21]. Many intervention studies to improve breast cancer and cervical cancer screening behavior have used the Health Belief Model, and those studies have shown specific effectiveness [13], [22]. Therefore, we used the Health Belief Model as the theoretical framework for this study.

MATERIAL AND METHODS

Design

A random control trial was used in this study.

Sampling and Randomization

Sample size: A total of 204 women were randomly selected to participate in the pre-intervention survey in 2 rural communes of Hai Duong, Vietnam, and then being invited continually to participate in the intervention program and re-evaluate after 3 months.

Sample selection: The 204 rural women participating in the study were selected through a 3-step process.

Step 1: Randomly draw to select 02 localities in the administrative units of Hai Duong province. As a result, 02 districts were randomly selected: Thanh Mien and Cam Giang districts.

Step 2: Among the total number of commune-level administrative units in the above two districts, we randomly drew 02 communes into the study.

Step 3: Select the number of women in each commune to be included in the research sample. Specifically, we compiled a list of all women who met the study's selection criteria. This list was taken from the commune women's union and commune health station and was updated and arranged in an Excel file. Then, using the systematic random sampling method, we selected the number of women to be included in the study. However, to prevent participants from stopping the study voluntarily or being excluded from the study due to ineligibility, we called 110 women in each commune. In the end, the actual number of women participating was a total of 204 women, of which there were 99 women in the intervention group and 105 in the control group.

Rural women were selected for this study if they met all inclusion criteria, including 1) having aged from 20-59, 2) Not not in a phase of pregnancy, or breastfeeding, 3) could speak, read,

listen, and understand the Vietnamese language; 4) Not in a serious stage of illness, and 5) willing to participate our research.

Exclusion criteria: Women with (1) cognitive disorders; (2) impaired ability to listen, read, and understand Vietnamese; (3) changed residence during the follow-up period; (4) did not participate in 2 tutoring sessions after the intervention or (5) did not participate in the study until the end.

Data collection

The data collection tool used in this study consists of two parts:

Part 1 included five contents to collect demographic information of research subjects (age, occupation, marital status, monthly income level, family history of breast cancer).

Part 2 used the Breast Self-Examination Practice Evaluation Checklist developed by the research team based on cancer communication documents of the Vietnamese Ministry of Health [7]. The checklist includes 8 items with sections divided into 5 steps of the breast self-examination process that includes the woman herself looking at and feeling each breast to look for changes, in size, discharge, swelling, dimpling, and other abnormalities [24]. Each step performed was evaluated as "Yes" when they did it well and was equivalent to 1 point, and vice versa, "No" when they did not do it or do it but seriously wrong and is equivalent to 0 points. According to the study of Kashfi SM et al. (2012), participants were classified as having passed the practice when the total score accounted for equal or over 8.5 points, while a total score under 8.5 points meant that women got fail result [23]. In addition, there were 2 additional questions regarding whether women performed breast self-examination with two options (Yes/No), and how often they performed it (frequency of implementation if women did it once a month; not often means they did it anytime) [22].

Intervention

The educational intervention program includes theoretical lectures with PowerPoint presentations, sample videos, and instructions for practicing breast self-examination on breast models. Each live educational session was conducted within 90 minutes, in which the theoretical lecture was presented in the form of a 15-minute PowerPoint and a short video of breast self-examination practice steps in 2 minutes. Accordingly, the research team spent 10 minutes for the PhD candidate to perform the breast self-examination procedure on the model. The remaining time was for the practice group, specifically, the research team divided all members of the experimental group into small groups of 10-15 women/group to perform breast self-examination on the implanted silicon breast model with abnormal tumor transplantation under the guidance of the research team. In the last 10 minutes before the end of the educational intervention, the research team gathered all the women and encouraged them to ask questions and present barriers to implementation, while also encouraging them to discuss methods to overcome those barriers. When the educational session ended, we sent the lecture content in the form of color-printed flyers

and an eye-catching bathroom card with stickers to stick on the bathroom mirror to help them establish the habit of regular breast self-examination every month. The location where we organized the intervention was a cultural house in the research area to help women participate conveniently.

During the 3-month post-intervention monitoring and evaluation period, the research team visited women in experimental group who had participated in intervention sessions through their women's club and folk-dance club to help them correct the wrong steps in the breast self-examination process. In addition, the research team also visited thehomes of 13 women because they did not join any clubs (see Figure 1).
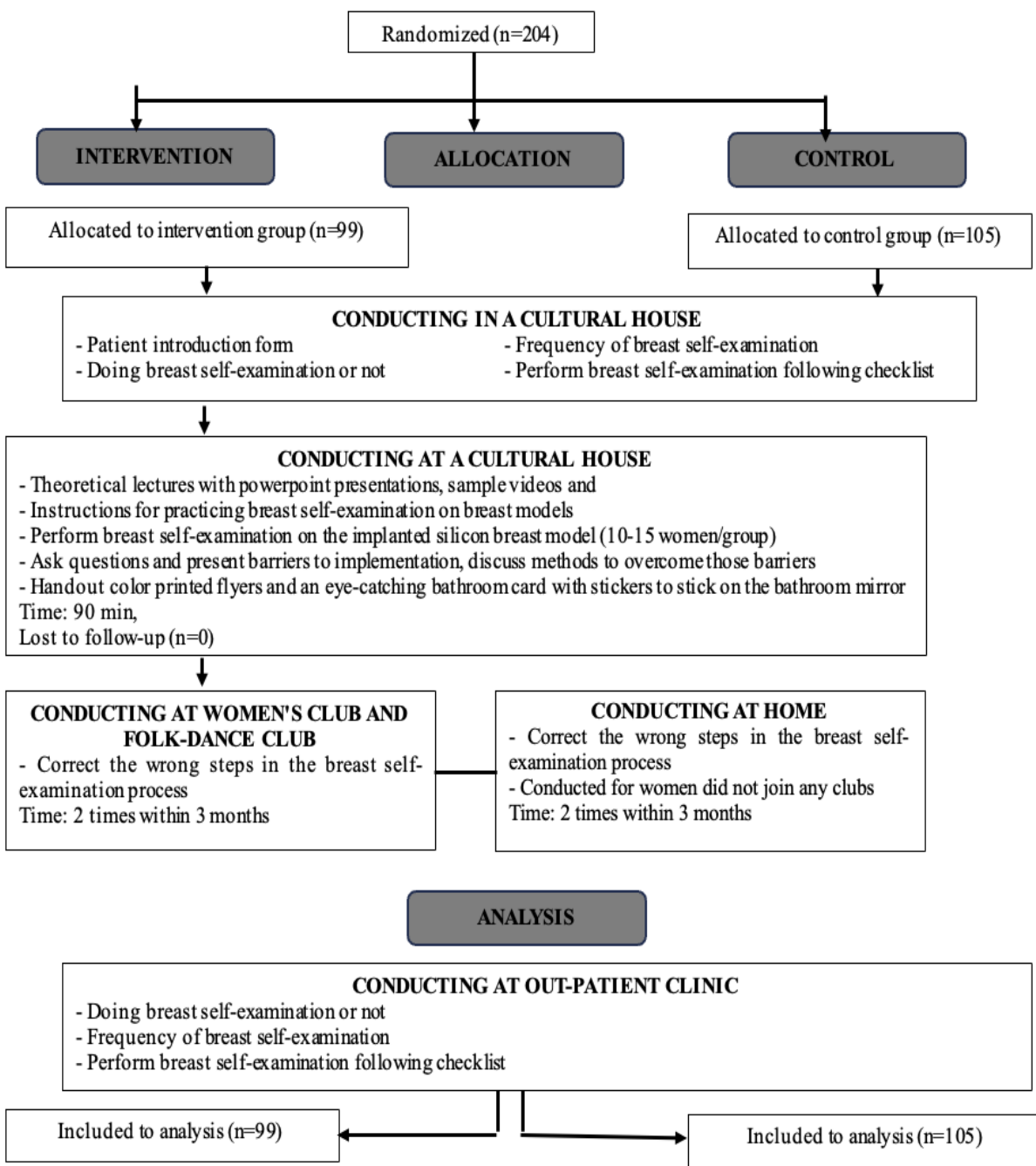
Figure 1. Study flow chart

Ethical considerations

The study was reviewed and approved by Nam Dinh University of Nursing. No.2675/GCN-HĐĐD.

During the post-intervention monitoring and evaluation period, the control group did not receive any form of intervention from us. However, after the end of the intervention period, we conducted a theoretical and practical education session for the control group.

Data Analysis

The SPSS 20.0 software was used to collect data. Mann-Whitney U test, and Chi-square test were used to compare 2 mean values and 2 proportions for non-normally distributed variables. In addition, the McNemar's test, and Chi-square test also were used to compare pairing ratios in evaluating intervention effectiveness.

RESULTS

Demographic characteristics of participants

Table 1. *Demographic characteristics of participants*

Contents	Experimental group (N=99) N(%)	Control group (N=105) N(%)	P
Age	47.18± 7.754	45.12 ± 7.133	0.861
Education level			0.695
High school or Under	76(76.8)	83(79.0)	
Post-high school	23(23.2)	22(21.0)	
Monthly income level			0.213
< 2 milion (Vietnam dong)	26(26.3)	73(73.7)	
>= 2 milion (Vietnam dong)	36(34.3)	69(65.7)	
Family history of breast cancer			1.000
Yes			
No	4(4.0)	4(3.8)	
	95(96.0)	101(96.2)	

Table 1 shows that before implementing the intervention program, there was no difference in the average age of the study groups (p = 0.89). At the same time, there was no difference in education level, monthly income level, or family history of breast cancer between the 2 study groups (p>0.05).

Changes in the rate of breast self-examination practice among two group of rural women

Table 2. *Changes in the rate of breast self-examination practice among rural women*

| Group Outcomes | Breast self-examination practice | | | | |
| | Pre-test | | Post-test | | P |
	n	%	n	%	
Control group (n=105)	35	33.3	40	38.1	0.302
Experimental group (n=99)	26	26.3	88	88.9	0.000
P	0.270		0.000		

Before the intervention, the proportion of rural women who self-reported low levels of breast self-examination in the two study groups was the same, the difference was not statistically significant with 95% confidence (p = 0.270). But after 3 months of intervention, the proportion of study subjects who performed breast self-examination in the intervention group increased to 88.9%, a statistically significant difference (p = 0.000); While the control group had no difference after 3 months compared to before intervention (p = 0.302) (see Table 2).

Changes in the frequency of breast self-examination practice among two group of rural women

Table3. *Changes in the frequency of breast self-examination practice among two group of rural women*

| Group Outcomes | Frequency of breast self-examination practice | | | | |
| | Pre-test | | Post-test | | P |
	n	%	n	%	
Control group (n=105)	17	16.2	17	16.2	1.000
Experimental group (n=99)	16	16.2	70	70.7	0.000
P	0.996		0.000		

Results in Table 3 showed that before the intervention, the proportion of subjects participating in regular breast self-examination (once a month) in the two study groups was the

same, the difference was not statistically significant (p = 0.996). After 3 months of intervention, the proportion of rural women performing regular breast self-examination in the intervention group increased to 70.7% compared to 16.2% before the intervention (p<0.05); while the control group did not change 16.2% compared to before intervention (p>0.05).

Changes in the practice of breast self-examination following the checklist among two group of rural women(nurse observation)

Table 4. *Changes in the practice of breast self-examination following the checklist among two group of rural women(nurse observation)*

Group Outcomes	practice of breast self-examination following the checklist (nurse observation)				P
	Pre-test		Post-test		
	n	%	n	%	
Control group (n=105)	25	28.6	30	28.6	0.063
Experimental group (n=99)	15	15.2	88	88.9	0.000
P	0.158		0.000		

Results in Table 4 showed that before the intervention, the rate of correct breast self-examination practice in women of the control group was higher than in the experimental group, but the difference was not statistically significant (p = 0.158). After 3 months of intervention, the proportion of rural women who practiced breast self-examination according to the 5-step process with passed results in the experimental group increased very high, from 15.2% to 88.9%, the difference was statistically significant (p = 0.000), while the control group improved but not significantly, only reaching 28.6% (p = 0.063).

DISCUSSION

Breast self-examination is a necessary activity for health maintenance, and it is a very important behavior of women in the early detection of abnormalities in the breast and breast cancer, thereby reducing the mortality rate of the disease.

In our study, before the intervention, most rural women in both groups did not practice breast self-examination, the difference was not statistically significant (p = 0.270). However, after participating in a live education session through theoretical lectures and practicing breast self-examination on the breast model, an increase in the proportion of women practicing breast self-examination and practicing regularly in the intervention group was higher than those in the control group. This result is similar to many previous studies such as Aghamolae et al. (2011) showed that participants in the educational program practiced breast self-examination more frequently than

those in the control group [25]. Other research by Kolutek et al (2018) showed that the rate of women in the experimental group performing breast self-examination increased after the intervention program [26]. In addition, compared to the study of Zavare et al (2016), we found that the intervention programs of our study and this author's study were quite similar in educational contents and setting of intervention, the effectiveness of our intervention with a rate of breast self-examination and regular breast examination of rural women belonging to experimental group was much higher, with 70.7% while the result of Zavare's study only accounted at15.6% and 16.7% after 6 months and 12 months after intervention, respectively [27]. This can be explained by the support activities we implemented at the end of the intervention session such as distributing bathing cards, and face-to-face meetings through regular activities at folk dance clubs, or women's associations in the commune during the follow-up period was effective and helped increase women's motivation and confidence to continue performing regular breast self-examination to help maintain effectiveness after intervention. Similar to the study of Ouyang and Hu (2014) in China, the results were similar to our study with high breast self-examination practice rates of women with 84.2% and 92.1% at 1 and 3 months after the intervention, respectively. The same result within our study and Ouyang and Hu's study can be explained bt the fact that Ouyang and Hu's study conducted a health education session combined with follow-up meetings directly and phone reminders for 1 and 3 months after the intervention [28].

The effectiveness of our intervention program not only increased the rate of practicing and frequency of practicing, but also the technical accuracy at each step when performing breast self-examination was the goal we aim, and it is also one of the main variables of this study. After the 3 months of intervention, the rate of practicing breast self-examination assessed as passed in the experimental group who participated in the educational session increased very high, with 88.9% compared to the initial 15.2%, respectively, while there was no difference in the control group (p = 0.063). Our results were similar to Secginli and Nahcivan's study (2011), this author found that participants were significantly more skilled in detecting breast abnormalities when they received education sessions that combined theory and demonstrated breast self-examination by using a silicone breast model [29]. Moreover, our research results have shown the important role of breast self-examination practice education on the model as a main method to improve the effectiveness of intervention on breast self-examination. This finding was similar to the results of Malak and Dicle'study (2007), which identified that by using theoretical educational methods combined with direct practice, participants' knowledge and skills to perform breast self-examination were improved [15]. In addition, the study by Gucuk and Uyeturk (2013) showed that awareness and practice of breast self-examination in women who participated in education about breast self-examination on simulation models with medical professionals were better if compared to those who only heard about breast self-examination from media sources such as television and the Internet [19].

CONCLUSION

The results of this study demonstrated that an educational program designed based on the Health Belief Model presenting in the form of theoretical lectures combined with practical instructions increased the performance of breast self-examination of Vietnamese rural women. Therefore, the educational intervention based on the Health Belief Model should be expanded to women living in other rural areas of Vietnam to help rural women have the skills to self-examine their breasts and detect breast cancer early, that improves quality of life and reduces the burden on the health system.

RECOMMENDATION

The educational intervention based on the Health Belief Model played a key role to help rural women in Vietnam for performing of breast self-examination. So, this intervention should expanded to women living in other rural areas of Vietnam to help rural women have the skills to self-examine their breasts and detect breast cancer early, that improves quality of life and reduces the burden on the health system.
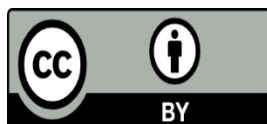
REFERENCES

1. WHO. *Cancer today*. http://gco.iarc.fr/today/home (accessed 2021-09-02).

2. Bộ y tế (2020). Hướng dẫn và chẩn đoán, điều trị UTV. 60.

3. Trieu, P. D. (Yun); Mello-Thoms, C.; Brennan, P. C (2015). Female Breast Cancer in Vietnam: A Comparison across Asian Specific Regions. *Cancer Biol Med*. *12* (3), 238–245.

4. Azage, M.; Abeje, G.; Mekonnen, A (2013). Assessment of Factors Associated with Breast Self-Examination among Health Extension Workers in West Gojjam Zone, Northwest Ethiopia. *Int J Breast Cancer*. 814395.

5. Bộ y tế vn (2015). Chiến lược quốc gia phòng chống bệnh không lây nhiễm giai đoạn 2015 - 2025. 117.

6. World Health Organization. *Breast cancer*. https://www.who.int/news-room/fact-sheets/detail/breast-cancer

7. Trần Quang Mai T. V. T (2015). Truyền thông phòng chống ung thư, Tài liệu dành cho học viên.

8. Smith, R. A.; Brooks, D.; Cokkinides, V.; Saslow, D.; Brawley, O. W (2013). Cancer Screening in the United States, 2013: A Review of Current American Cancer Society Guidelines, Current Issues in Cancer Screening, and New Guidance on Cervical Cancer Screening and Lung Can. *CA: A Cancer Journal for Clinicians*. *63* (2), 87–105.

9. Bộ Y Tế. *Quyết định 1639/QĐ-BYT 2021 Tài liệu sàn lọc ung thư vú ung thư cổ tử cung tại cộng đồng*. https://thuvienphapluat.vn/van-ban/The-thao-Y-te/Quyet-dinh-1639-QD-BYT-2021-

Tai-lieu-san-loc-ung-thu-vu-ung-thu-co-tu-cung-tai-cong-dong-468045.aspx (accessed 2022-10-14).

10. Moey, S.-F.; Mohamed, N. C.; Lim, B.-C (2020). A Path Analytic Model of Health Beliefs on the Behavioral Adoption of Breast Self-Examination. *AIMS Public Health*. *8* (1), 15–31.

11. Dewi, T. K.; Massar, K.; Ruiter, R. A. C.; Leonardi, T (2019). Determinants of Breast Self-Examination Practice among Women in Surabaya, Indonesia: An Application of the Health Belief Model. *BMC Public Health*. *19* (1), 1581.

12. Yeshitila, Y. G.; Kassa, G. M.; Gebeyehu, S.; Memiah, P.; Desta, M (2021). Breast Self-Examination Practice and Its Determinants among Women in Ethiopia: A Systematic Review and Meta-Analysis. *PLOS ONE 16* (1), e0245252.

13. Khiyali, Z.; Aliyan, F.; Kashfi, S. H.; Mansourian, M.; Jeihooni, A. K (2017). Educational Intervention on Breast Self-Examination Behavior in Women Referred to Health Centers: Application of Health Belief Model. *Asian Pac J Cancer Prev*. *18* (10), 2833–2838.

14. Lotfi, B.; Hashemi, S. Z.; Ansari-Moghadam, A (2012). Investigation of the Impact of HBM-Based Training on BSE in Women Referred to Health Centers in Zahedan in 2010-2011. *jhs*. *1* (1), 39–43.

15. Champion, V. L (1984). Instrument Development for Health Belief Model Constructs. *ANS Adv Nurs Sci*. *6* (3), 73–85.

16. Parsa, P.; Mirmohammadi, A.; Khodakarami, B.; Roshanaiee, G.; Soltani, F (2016). Effects of Breast Self-Examination Consultation Based on the Health Belief Model on Knowledge and Performance of Iranian Women Aged Over 40 Years. *Asian Pac J Cancer Prev*. *17* (8), 3849–3854.

17. Occa, A.; Suggs, L. S (2016). Communicating Breast Cancer Screening With Young Women: An Experimental Test of Didactic and Narrative Messages Using Video and Infographics. *Journal of Health Communication*. *21* (1), 1–11.

18. Fatemeh, M.; Parisa, S.; Sam, H (2018). Health Beliefs as Predictors of Breast Self-Examination Behavior. *Int J Women's Health Wellness*. *4* (2).

19. Asghari, E.; Nahamin, M.; Khoshtarash, M.; Ghanbari, A.; Parizad, N.; Mahdavi, N.; Asgarlo, Z (2015). The Relationship Between Health Belief and Breast Self-Examination Among Iranian University Students. *International Journal of Women's Health and Reproduction Sciences*. *4*, 110–113.

20. Noman, S.; Shahar, H. K.; Abdul Rahman, H.; Ismail, S.; Abdulwahid Al-Jaberi, M.; Azzani, M (2020). The Effectiveness of Educational Interventions on Breast Cancer Screening Uptake, Knowledge, and Beliefs among Women: A Systematic Review. *IJERPH*. *18* (1), 263.

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21. Kashfi, S., Khani Jeihooni, A., Yazdankhah, M (2009). The Effect of Education about Breast Self-Examination on Knowledge, Attitude and Practice of Women in Nourabad Mamasani Health Clinics. *jjums*. *10* (1), 40–45.

22. Ginsberg, G. M.; Lauer, J. A.; Zelle, S.; Baeten, S.; Baltussen, R (2012). Cost Effectiveness of Strategies to Combat Breast, Cervical, and Colorectal Cancer in Sub-Saharan Africa and South East Asia: Mathematical Modelling Study. *BMJ*. *344*, e614.

23. Aghamolaei, T.; Hasani, L.; Tavafian, S. S.; Zare, S (2011). Improving Breast Self-Examination: An Educational Intervention Based on Health Belief Model. *Int J Cancer Manag*. *4* (2).

24. Kolutek, R.; Avci, I. A.; Sevig, U (2018). Effect of Planned Follow-up on Married Women's Health Beliefs and Behaviors Concerning Breast and Cervical Cancer Screenings. *J Canc Educ*. *33* (2), 375–382.

25. Akhtari-Zavare, M.; Juni, M. H.; Said, S. M.; Ismail, I. Z.; Latiff, L. A.; Ataollahi Eshkoor, S (2016). Result of Randomized Control Trial to Increase Breast Health Awareness among Young Females in Malaysia. *BMC Public Health*. *16*, 738.

26. Ouyang, Y.-Q.; Hu, X (2014). The Effect of Breast Cancer Health Education on The Knowledge, Attitudes, and Practice: A Community Health Center Catchment Area. *J Canc Educ*. *29* (2), 375–381. https://doi.org/10.1007/s13187-014-0622-1.

27. Secginli, S.; Nahcivan, N. O (2011). The Effectiveness of a Nurse-Delivered Breast Health Promotion Program on Breast Cancer Screening Behaviours in Non-Adherent Turkish Women: A Randomized Controlled Trial. *Int J Nurs Stud*. *48* (1), 24–36.

28. Malak, A. T.; Dicle, A. Assessing the Efficacy of a Peer Education Model in Teaching Breast Self-Examination to University Students.

29. Gucuk, S.; Uyeturk, U (2013). Effect of Direct Education on Breast Self Examination Awareness and Practice among Women in Bolu, Turkey. *Asian Pac J Cancer Prev*. 14 (12), 7707–7711.