**124** ประสิทธิผลของกิจกรรมเพื่อส่งเสริมพฤติกรรมการตรวจเต้านมด้วยตนเองของสตรีวัยผู้ใหญ่:
การทบทวนอย่างเป็นระบบและการวิเคราะห์เชิงอภิมาน

วารสารพยาบาลทหารบก
Journal of The Royal Thai Army Nurses

# ประสิทธิผลของกิจกรรมเพื่อส่งเสริมพฤติกรรมการตรวจเต้านมด้วยตนเอง ของสตรีวัยผู้ใหญ่: การทบทวนอย่างเป็นระบบและการวิเคราะห์เชิงอภิมาน

## The Effectiveness of Interventions for Improving Breast Self- examination Behaviours among Adult Women: A Systematic Review and Meta-analysis

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**บทคัดย่อ**

การทบทวนอย่างเป็นระบบ (Systematic review) และการวิเคราะห์เชิงอภิมาน (Meta-analysis) ครั้งนี้ มีวัตถุประสงค์ เพื่อศึกษาประสิทธิผลของกิจกรรมส่งเสริมพฤติกรรมการตรวจเต้านมด้วยตนเองในสตรีวัยผู้ใหญ่ กลุ่มตัวอย่างคือวรรณกรรมที่ เกี่ยวข้องกับการตรวจเต้านมด้วยตนเองในสตรีวัยผู้ใหญ่ที่ได้รับการตีพิมพ์ในฐานข้อมูลอิเล็คโทรนิคส์ ระหว่างปี 2000 – 2018 คำหลักในการสืบค้น คือ "การตรวจเต้านมด้วยตนเอง" ทบวรรณกรรม 8 เรื่องที่ถูกคัดเลือกเข้ากลุ่มตัวอย่าง

ผลการวิเคราะห์ข้อมูลพบว่า กิจกรรมส่งเสริมการตรวจเต้านมด้วยตนเองในภาพรวม มีผลทาง บวกต่อพฤติกรรมการ ตรวจเต้านมด้วยตนเองอย่างมีนัยสำคัญทางสถิติ (effect size 0.82 , 95% CI = 0.24-1.40) และกิจกรรมการให้ความรู้โดยใช้กรอบ แนวคิดความเชื่อด้านสุขภาพ (Health belief model) มีประสิทธิผลสูงสุดในการส่งเสริมพฤติกรรมการตรวจเต้านมด้วยตนเอง (effect size 2.72, 95% CI = 2.17-3.27) ส่วนผลการวิเคราะห์เชิงอภิมานกลุ่มย่อย พบว่ากิจกรรมที่มีการกระตุ้นเตือนให้ตรวจ เต้านมด้วยตนเองทุกเดือน ส่งผลต่อการเพิ่มขึ้นของพฤติกรรมการตรวจเต้านมด้วยตนเองอย่างมีนัยสำคัญทางสถิติ (effect size 0.83, 95% CI = 0.13-1.52)

ผลการศึกษาครั้งนี้ช่วยให้พยาบาลหรือบุคลากรสุขภาพ สามารถเลือกใช้กิจกรรมเพื่อส่งเสริมการตรวจเต้านมด้วยตนเอง ของสตรีวัยผู้ใหญ่ให้เกิดประสิทธิผลเพิ่มขึ้น

**คำสำคัญ:** พฤติกรรมการตรวจเต้านมด้วยตนเอง สตรีวัยผู้ใหญ่ การทบทวนอย่างเป็นระบบการวิเคราะห์เชิงอภิมาน

## Abstract

This study aimed to evaluate the effectiveness of interventions to improve Breast self-examination (BSE) behaviour among adult women through the analysis and synthesis method. A systematic review and meta-analysis methodology was used as the research design. The search of existing literature was performed using electronic databases. The search terms that were used were "Breast self-examination" and "self-breast examination".  Literature published between 2000 and 2018, comprising of eight articles which met inclusion criteria were selected.

The study showed eight full-text articles met the eligible criteria used for a systematic review and meta-analysis. The results of the meta-analysis found overall interventions which had a significant positive effect on improving BSE behaviours in adult women with a combined effect size 0.82 (95% CI = 0.24-1.40). The educational programe based on health belief model was the most effective intervention used to improve BSE behaviours of all interventions with the highest combined effect size 2.72 (95% CI = 2.17-3.27). The findings of subgroup analysis showed that the interventions cooperated with a reminder to BSE perform monthly which had a significant and overall effect on improving BSE with a combined effect size 0.83 (95%  CI=0.13-1.52).

The findings of this research are useful for nurses and healthcare providers to choose an intervention to encourage adult women to perform BSE effectively.

**Keywords:** Breast self-examination behaviours, adult women, systematic review, meta-analysis

## 1. Introduction

Breast cancer (BC) is the most common cancer in women globally both in developed and developing countries.[1-2-3-4] The incidence rates of breast cancer show elevations in Asian and Middle Eastern countries, and the number of mortality rates tends to increase every year.[2,5] Diagnosis of breast cancer cause to several negative impacts not only on those women, but also their families and health care systems such as suffering from side effect of treatment, dependence on family members, using a high-cost treatment which lead to burdens on the healthcare systems, and it became eventual economic loss in their countries. So, early detection would minimize the treatment cost, enhance the survival rate, reduce the mortality rates, and eventually enhance quality of life among those women.  Therefore, it is essential to encourage women to report the abnormal changes in their breasts at the early period.

Breast self-examination (BSE) was recommend for breast cancer screening  as it is the most accessible method for detecting mass or abnormality in breasts of women,6  does not take a long time, it's safe, non- invasive, and low-cost.[2,7-8] Moreover, 30% -95% of advanced and early breast cancer stages were discovered via performing BSE by patients' themselves.[2,6,8] Although experts developed several interventions to enhance BSE practice among women, several studies reported that those women have not done BSE or irregular performing BSE[8] Likewise, Hasani, Tavafian, Aghamolaei, Zare[9] found that 12.5 % of adult women did not perform BSE even though they had received intervention to enhance BSE practice. Moreover, the previous studies lack explicit evaluation of the effectiveness of the intervention to improve BSE behaviours outcomes. For instance, Ergin, Sahin NH, Sahin FM, Yaban, Acar, Bektas[10] have compared the relationship between subdimension of health belief

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model scale on an individual's performing and not performing BSE, and the meta-analysis study of Ku[8] which examined the relationship between BSE behaviors, BSE education, the stage and the survival rates for breast cancer. While Usher, Stanek, Newman, Obermair, Trimmel.[11] aimed to synthesize the impact of interventions about cancer risk on intention to change health-related behaviours. However, there is no study to evaluate the effectiveness of interventions to improve BSE among adult women. So, systematic review and meta-analysis are required to synthesize the pieces of evidence to obtain the conclusion of the effectiveness of interventions, in order to help healthcare providers choose an intervention to improve BSE behaviours appropriately.

## 2. Objectives

This study aimed to evaluate the effectiveness of interventions to improve BSE behaviors in adult women through analysis and synthesis method.

## 3. Methods and systematic search results

This systematic review and meta-analysis were conducted following the guideline of the Cochrane Collaboration. The steps consisted of review question and inclusion criteria, searching for studies, study selection and critical appraisal, data extraction and synthesis, interpretation of finding and recommendation to guide nursing practice step.[12]

### 3.1 Search strategy

"Breast self-examination," "self-breast examination" were used as the initial keywords, "and/or" was used to combine vocabulary with other words such as "behaviours," "adult women," "female." The search strategy was performed through electronic databases from CINAHL plus with full text, ProQuest and EBSCO host, Web of Science, Science Direct, Google Scholar, single search from CU reference databases. Then the investigators extended the search

by Thai Journal Citation Index Centre, including search in libraries of the universities in Thailand.

### 2.2 Study selection

PICO question was used to recruit all kinds of literature based on inclusion criteria were 1) Randomized Control Trial (RCTs) or quasi-experimental published as a research paper in a peer-reviewed journal, 2) English or Thai literature published between 2000 and 2018, 3) sample was adult women, 4) BSE behaviors outcome was measured by using mean and standardized measure. Meanwhile, studies in other female populations, or graduate and postgraduate students were not included in this study. Also, literature was also rejected if the outcomes did not relate to BSE behaviours, non control group in the study, and articles not available in the full text.

### 2.3 Systematic search result

PRISMA flow diagramme was used to guide a systematic search in this study. A total of (1631) articles were initially identified searching from online databases. Six-hundred and sixty- nine articles were retrieved after duplication removal, and first title screening step, followed by (175) articles were retrieved from the secondary title and abstract screening step. Finally, thirty- three full-text articles were met eligible criteria. However, twenty-five full-text articles were excluded during this step since the outcome was not measured by using mean standardized measured (n = 11), full -text did not available (n = 2), one study was not randomized control trial (RCTs) (n = 1), outcomes did not relate to BSE behaviors (n = 5), sample was not adult women (n = 2), and unpublished (papers did not approve by a peer-reviewed) (n = 4). Finally, eight articles were used for the systematic review and meta-analysis. In this step, two authors (the first and the second author) screened half of the abstract to excluded papers that were not relevant, then all full

articles which met desirable criteria were read and discussed by two authors again. If a different opinion appears, the final decision will come from the third and the forth author.

### 2.4   Data extraction and quality assessment

Each article that fully met the eligibility was appraised following the Joanna Brigs Institute Critical Appraisal Tool: Meta-Analysis of statistics Assessment and Instrument which consisted of 10 items and high-quality appraisal was at mean scores over than six. All of eight full-text articles were in a high-quality group, and no studies were excluded because of a low risk of bias. Data from full studies were extracted and drawn into the table based on (1) characteristics of sample (age, number of samples, setting), 2) intervention (method, tool used, process), 3) theoretical underpinning, 4) duration of follow-up, 5) variables outcomes and 6) results. In this step, the first author extracted data into the table and discussed again with other authors before going beyond to data analysis and synthesis of the systematic review and meta-analysis stages.

### 2.5 Data synthesis and statistical analysis

Data synthesis of systematic review was conducted by comparison, analysis, and summary. Meta-analysis was analyzed by using the statistical software package Rev Man 5.3. The effectiveness of interventions was presented as a combined effect size. Random – effects model and inverse variance method were used in this study, since there was heterogeneity between studies (Q = 134.08, P-value < 0.00001, I2 = 95 %) (See table 1)

## 3. Results

The results of systematic reviews showed that most studies were conducted in developing countries, (50% for Asian countries, 37.5% for Middle-Eastern countries, and 12.5% for European

countries), and the most BSE studies took place in Iran (3 studies), the second was in Thailand with 2 studies, while study from Taiwan, South Korea, and Austria  met eligible criteria with one article. The sample size of eight studies was between 30 and 111 cases, and the participant's age was 20 – 65 Moreover, there was a variation of characteristics of participants attending in the studies. Two studies were conducted in adult women related to a high risk of breast cancer,[13,16] two studies with adult women  from community,[14-15] two studies with women visiting health care center,[2,6]  and one study for premenopausal women and in women who underwent breast cancer surgery.[5,7] Health Belief Model (HBM) was the most popular used as conceptual framework of all studies, which accounted for 62.5 %,[2,6,13,15-16] Others were a health-related behaviour  theory,[5] theory of planned behavior[7] and protection motivation theory.[14]

Besides, the educational programme based on health belief model (HBM)[2,6,16] was the major interventions used for improving BSE (37.5%), teaching and training BSE interventions, and using multimedia (e.g. a videotaped and the short message service or SMS) were used with 25% respectively, while a motivation on BSE programme was found with 12.5%. Moreover, 6 studies follow-up BSE behaviours after receiving intervention at 3 months (75%),[2,7,13-14-15-16] whereas one study was follow-up at 2 months[6] and 6 months[5] respectively.

3.1 The effectiveness of the intervention on BSE behaviours The results of the meta-analysis found that overall the interventions had a significant positive effect on BSE behaviours in adult women with a combined effect size 0.82 (95% CI = 0.24 -1.40) (See table 1). However, there were 4 studies showed statistically significant differences in BSE behaviours between intervention groups and usual care groups (P = 0.0006),[5,14-15-16] (See table 1) and the

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educational intervention based on HBM was the most significantly positive effect on improving BSE behaviours among adult women with a highest combined effect size 2.72 (95% CI = 2.17- 3.27),[16] followed by a motivation programme with a combined

effect size 1.54 (95% CI = 0.96 – 2.12).[14] Whereas four interventions found no statistically significant differences between intervention groups and usual care groups (p = 0.0006)[2,6-7,13] (Table 1).

**Table 1:** Meta-analysis studies comparing the effectiveness of interventions and usual care on BSE behaviours

| Study or Subgroup | Interventions | | | Usual care | | | | Std. Mean Difference |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Total | Mean | SD | Total | Weight | IV, Random, 95%CI |
| Khiyali et al 2017 | 0.45 | 3.11 | 46 | 0.97 | 1.25 | 46 | 12.5% | -0.22 [-0.63, 0.19] |
| Nahidi et al 2017 | 23.84 | 2.85 | 72 | 23.91 | 2.87 | 72 | 12.8% | -0.02 [-0.35, 0.30] |
| Lu 2001 | 0.48 | 1.98 | 30 | 0.24 | 0.58 | 40 | 12.3% | 0.17 [-0.30, 0.65] |
| Janda et al 2002 | 7.9 | 7.71 | 111 | 6.1 | 7.6 | 108 | 13.0% | 0.23 [-0.03, 0.50] |
| Chung et al 2015 | 4.6 | 2.1 | 102 | 2.9 | 2.4 | 100 | 12.9% | 0.75 [0.47, 1.04] |
| Petsirasan & Nhoonin 2010 | 14.26 | 2.78 | 80 | 6.86 | 6.27 | 80 | 12.7% | 1.52 [1.17, 1.87] |
| Jiteure et al 2017 | 22.26 | 6.35 | 30 | 12.1 | 6.68 | 30 | 11.8% | 1.54 [0.96, 2.12] |
| Hajian et al 2011 | 5.22 | 0.67 | 50 | 2.82 | 1.04 | 50 | 11.9% | 2.72 [2.17, 3.27] |
| Total (95% CI) | | | 521 | | | 526 | 100.00% | 0.82 [0.24, 1.40] |

Moreover, the finding of subgroup analysis found that duration of follow-up BSE behaviours after receiving interventions at three months had the statistically significant difference between intervention and usual care groups in overall with a combined effect size 0.98 (95% CI = 0.18-1.79) (Table 2). Followed by follow-up BSE behaviours longer than three months with a combined effect size 0.75 (95% CI = 0.47-1.04). However, no significant differences in the studies with follow-up BSE behaviours shorter than three months (effect size -0.02, 95% CI = -0.35-0.30) (Table 2). Furthermore, the subgroup analysis of the characteristic of adult women found that participants who related to breast cancer had a significant effect on interventions for improving BSE behaviours in overall with effect size 0.95 (95% CI = 0.08-1.82). However, 2 studies report that characteristics of participants who underwent

surgery for breast cancer,[5] and women with a family history of breast cancer[16] had statistically significant differences between intervention groups and usual care groups with a combined effect size 0.75 (95% CI = 0.47-1.04), and 2.72 (95%CI = 2.17-3.27) respectively. In addition, interventions cooperated a reminder to perform BSE, such as using electronic devices (SMS texting and telephone calling),[5] including stimulation by a health care provider [15] were significant differences between intervention groups and usual care groups in overall (effect size = 0.83, 95%CI = 0.13-1.52), and the results showed that effect of a reminder to continue BSEby a healthcare provider, such as a nursing student, was higher on BSE behavior among those adult women than other methods with a combined effect size 1.52 (95% CI = 1.17-1.87).[15] (Table 3)

**Table 2**: Subgroup analysis to compare the duration of follow –up BSE behaviors between intervention groups and usual groups.

| Study or Subgroup | Interventions | | | Usual care | | | | Std.Mean Difference |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Total | Mean | SD | Total | Weight | IV, Random, 95%CI |
| **1. Less than 3 Months** | | | | | | | | |
| Nahidi et al 2017 | 23.84 | 2.85 | 72 | 23.91 | 2.87 | 72 | 12.8% | -0.02 [-0.35, 0.30] |
| Subtotal (95%CI) | | | 72 | | | 72 | 12.8% | -0.02 [-0.35, 0.30] |
| Heterogeneity: Not applicable | | | | | | | | |
| Test for overall effect Z = 0.15 (p =0.88) | | | | | | | | |
| | | | | | | | | |
| **2.  follow-up at 3 months** | | | | | | | | |
| Khiyali et al 2017 | 0.45 | 3.11 | 46 | 0.97 | 1.25 | 46 | 12.5% | -0.22 [-0.63, 0.19] |
| Lu 2001 | 0.48 | 1.98 | 30 | 0.24 | 0.58 | 40 | 12.3% | 0.17 [-0.30, 0.65] |
| Janda et al 2002 | 7.9 | 7.71 | 111 | 6.1 | 7.6 | 108 | 13.0% | 0.23 [-0.03, 0.50] |
| Petsirasan & Nhoonin 2010 | 14.26 | 2.78 | 80 | 6.86 | 6.27 | 80 | 12.7% | 1.52 [1.17, 1.87] |
| Jiteure et al 2017 | 22.26 | 6.35 | 30 | 12.1 | 6.68 | 30 | 11.8% | 1.54 [0.96, 2.12] |
| Hajian et al 2011 | 5.22 | 0.67 | 50 | 2.82 | 1.04 | 50 | 11.9% | 2.72 [2.17, 3.27] |
| Subtotal (95% CI) | | | 347 | | | 354 | 74.2% | 0.98 [0.18, 1.79] |
| | | | | | | | | |
| **3.  more than 3 months** | | | | | | | | |
| Chung et al 2015 | 4.6 | 2.1 | 102 | 2.9 | 2.4 | 100 | 12.9% | 0.75 [0.47, 1.04] |
| Subtotal (95% CI) | | | 102 | | | 100 | 12.9% | 0.75 [0.47, 1.04] |

**Table 3:** Subgroup analysis of intervention with or without reminder participants between intervention groups and usual groups.

| Study or Subgroup | Intervention | | | Usual care | | | Weight | Std Mean Difference |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Total | Mean | SD | Total | | IV, Random, 95% CI |
| **1. Intervention with reminder to continue BSE** | | | | | | | | |
| Lu 2001 | 0.48 | 1.98 | 30 | 0.24 | 0.58 | 40 | 12.3% | 0.17 [-0.30,2.65] |
| Chung et al. 2015 | 4.6 | 2.1 | 102 | 2.9 | 2.4 | 100 | 12.9 | 0.75 [0.47,1.04] |
| Petsirason & Nhoonin 2010 | 14.26 | 2.78 | 80 | 6.86 | 6.27 | 80 | 12.7 | 1.52 [1.17,1.87] |
| Subtotal (95% CI) | | | 212 | | | 220 | 37.9% | 0.83 [0.13,1.52] |
| | | | | | | | | |
| **2. Intervention without reminder to continue BSW** | | | | | | | | |
| Khiyali et al 2017 | 0.45 | 3.11 | 46 | 0.97 | 1.25 | 46 | 12.5% | -0.22 [-0.63,0.19] |
| Nahid et al. 2017 | 23.84 | 2.85 | 72 | 23.91 | 2.87 | 72 | 12.8% | -0.02 [-0.35,0.30] |
| Janda et al. 2002 | 7.9 | 7.71 | 111 | 8.1 | 7.6 | 108 | 13.0% | 0.23 [-0.03,0.50] |
| Jiteure et al.2017 | 22.26 | 6.35 | 30 | 12.1 | 6.66 | 30 | 11.8% | 1.54 [0.96,2.12] |
| Hajian et al 2011 | 5.22 | 0.67 | 50 | 2.82 | 1.04 | 50 | 11.9% | 2.72 [2.17,3.27] |
| Subtotal (95%) | | | 309 | | | 306 | 62.1% | 0.83 [-0.05,1.71] |
| Total (95% CI) | | | 521 | | | 526 | 100.0 | 0.83 [-0.05,1.71] |

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## 4. Discussion

The findings showed that interventions had statistically significant differences on BSE behaviors between intervention groups and usual care groups in adult women in overall. It might because almost included studies had similar elements to improve BSE behaviours, especially teaching about breast cancer disease through media sources, such as VCD, Power Point, posters, slides and films, given pamphlets to review at home, as well as demonstration BSE and training by using breast model and real practicing. The knowledge from the class teaching makes those women understand and aware about the importance of breast cancer early detection, susceptibility, severity of breast cancer disease, as well as perceived benefits of BSE. Moreover, demonstration BSE and practicing by using model or manual, and incentive for continuing BSE behaviours by a reminder through electronic devices or health care provider are the indispensable strategies that help increase BSE behaviours in adult women.[5-6-7,14-15-16] As can see that these components of the interventions can help those adult women have higher self-confident to perform BSE by themselves, have a motivation to perform BSE continuously. Finally, they determine to maintain BSE behavior. Likewise, the study of Ergin , Sahin NH, Sahin FM, Yaban, Acar, Bektas 10 reported that self-efficiency had a significant effect on the individual's performance of BSE for early breast cancer diagnosis.

The most useful size of the intervention to improve BSE behaviours among adult women in this study was the educational intervention based on HBM in the study of Hajian, Vakilian, Najabadi, Hosseini, Mirzaei.[16] with a combined effect size 2.72 (95% CI = 2.17- 3.27). This finding was not surprising because the program consisted of the important competences to help improve BSE behaviours; namely, teaching, BSE demonstration and so on. Additionally, duration for follow-up the BSE behaviours was three months, which was similar to the result of the subgroup analysis showed that duration of follow-up BSE behaviors at three months was the most significant difference on BSE behaviors between intervention and control groups (effect size 0.98, 95% CI = 0.18-1.79). Including, the participants in this study were adult women who have a family history of breast cancer. For that, they may be see under risk of getting breast cancer themselves more than other women group, and may have higher awareness and more frequently perform BSE than women without a breast cancer family history,[2,17] similar to the result of the subgroup analysis found that women related to breast cancer has significant effect on increasing BSE behaviours in overall (effect size 0.95, 95%CI = 0.08-1.82). Likewise, Ergin, Sahin NH, Sahin FM, Yaban, Acar, Bektas 10 found that women having family history of breast cancer are tend to more frequently perform BSE than those women without a family history of breast cancer in overall approximately 2 times.

In addition, subgroup analysis in this study showed that the effect of a reminder by using technology infrastructure, such as a short message service sending, telephones or a healthcare provider telling were significant effect on BSE behaviours in the intervention group than usual group. Since these methods can help adult women have awareness of breast cancer disease, and help remind them to pursue health-related behaviours such as BSE. A reminder from those strategies can decrease barriers of BSE e.g., forgetting, and help enhance adherence to BSE finally.5 Congruently, Ergin , Sahin NH, Sahin FM, Yaban, Acar, Bektas[10] mention that motivation was vital to develop healthy behaviours and using media sources; calling by a cell phone, sending e-mail or letter, and peer group, are also quite essential strategies to encourage for these behaviours.

## 5. Conclusion

Early detection is critical to improve breast cancer outcomes and survival rates, and one of the methods that can detect breast cancer since earlier is performing Breast self-examination (BSE) regularly, since it is a safety, a low-cost, simple and performed BSE by themselves. Moreover, it is the most effective method to help women discover changes in their breasts and report to a doctor or a health care provider quickly, especially in developing countries where they could not provide a high-cost of screening method such as mammogram as social welfare for all women. Therefore, it will be useful for the nurse to support using BSE to promote breast cancer awareness in adult women, including other general women population.

## 6. Recommendation for the future study

Although the findings of this systematic review and meta-analysis conclude that the educational program is the most effective interventions to improve BSE behaviours, increasing BSE behaviours does not come from only one component of the interventions. Therefore the future study of BSE behaviours should be improve from several components which accompany with the nterventions such as teaching about the breast cancer disease through multimedia sources, demonstration and training BSE, group discussion, and given a document to review at home . However, a reminder those women to maintain BSE continuously until being health behaviours is important, since it can help to decrease barriers of  performing BSE such as forgetting, finally it may enhance adherence to BSE behaviours among adult women based on each context of those women.

## References

1. Duda RB, Bhushan D. Teaching rural women in Nicaragua the principles of breast health. J Cancer Educ.2011;26(3):560-5

2. Khiyali Z, Aliyan F, Kashfi SH, Mansourian M, Khani Jeihooni A. Educational intervention on breast self examination behavior in women referred to health centers: application of health belief model. Asian Pac Cancer P. 2017; 18(10):2833-8.

3. Masso-Calderón AM, Meneses-Echávez JF, Correa-Bautista JE, Tovar-Cifuentes A, Alba-Ramírez PA, Charry-Ángel CE. Effects of an educational intervention on breast self-examination, breast cancer prevention-related knowledge, and healthy lifestyles in scholars from a low-Income area in Bogota, Colombia. J Cancer Educ. 2018;33(3):673-9.

4. Mohammadi E, Dadios EP, Gan Lim LA, Cabatuan MK, Naguib RN, Avila JM, et al. Real-time evaluation of breast self-examination using computer vision.  Int J Biomed Imaging. 2014;2014:924759.doi:10.1155/2014/924759. Epub 2014 Nov 11.

5. Chung IY, Kang E, Yom CK, Kim D, Sun Y, Hwang Y, et al. Effect of short message service as a reminder on breast self-examination in breast cancer patients: a randomized controlled trial. J Telemed Telecare. 2015;21(3):144-50.

6. Nahidi F, Dolatian M, Roozbeh N, Asadi Z, Shakeri N. Effect of health-belief-model-based training on performance of women in breast self-examination. Electron Physician. 2017; 9(6):4577-83.

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การทบทวนอย่างเป็นระบบและการวิเคราะห์เชิงอภิมาน

วารสารพยาบาลทหารบก
Journal of The Royal Thai Army Nurses

7. Janda M, Stanek C, Newman B, Obermair A, Trimmel M. Impact of videotaped information on frequency and confidence of breast self-examination. Breast cancer res and treat. 2002; 73(1):37-43.

8. Ku YL. The value of breast self-examination: meta-analysis of the research literature. Oncol Nurs Forum. 2001;28(5):815-22.

9. Hasani L, Tavafian SS, Aghamolaei T, Zare S. Improving breast self-examination: an educational intervention based on health belief model. Iran J Cancer Prev. 2011;4(2): 82-7.

10. Ergin AB, Sahin NH, Sahin FM, Yaban ZS, Acar Z, Bektas H. Meta analysis of studies about breast self examination between 2000-2009 in Turkey. Asian Pac J of Cancer Pre. 2012; 13(7):3389-97.

11. Usher-Smith JA, Silarova B, Sharp SJ, Mills K, Griffin SJ. Effect of interventions incorporating personalised cancer risk information on intentions and behaviour: a systematic review and meta-analysis of randomised controlled trials. BMJ Open. 2018;8:e017717. doi: 10.1136/bmjopen-2017-017717.

12. Aromataris E, Pearson A. The systematic review: an overview. Am J Nurs. 2014;114(3):53-8.

13. Lu ZYJ. Effectiveness of breast self-examination nursing interventions for Taiwanese community target groups. J Adv Nurs. 2002;34(2):163-70.

14. Jiteure S, Chantawong C, Krungkripetch N. Effects of motivation program on breast self examination of early adult females in Khlung municipality, Khung district, Chanthaburi province. J Prapokklao Hosp Clin Med Educat Center. 2017;34(1):41-53 (In Thai).

15. Petsirasan R, Noonill N. Effectiveness of a promoting self-breast examination program for adult women. Rama Nurs J. 2010;16(1):54-9 (In Thai).

16. Hajian S, Vakilian K, Najabadi KM, Hosseini J, Mirzaei HR. Effects of education based on the health belief model on screening behavior in high risk women for breast cancer, Tehran, Iran. Asian Pac J Cancer Prev. 2011;12(1):49- 54.

17. Powe BD, Underwood S, Canales M, Finnie R. Perceptions about breast cancer among college students: Implications for nursing education. J Nurs Educ. 2005;44(6):257- 65.