



# Post-operative pain management with non-pharmacological interventions in patients undergoing breast cancer surgery: A systematic scoping review

Rohman Hikmat<sup>1\*</sup>

Urip Rahayu<sup>2</sup>

Sandra Pebrianti<sup>2</sup>

Eka Maulidya Cahyani<sup>1</sup>

Cindy Puspita Sari<sup>1</sup>

Ghea Afrilia<sup>1</sup>

<sup>1</sup> Nursing Profession Study Program,  
Faculty of Nursing, Universitas  
Padjadjaran, Bandung, Indonesia

<sup>2</sup> Department of Medical and  
Surgical Nursing, Faculty of  
Nursing, Universitas Padjadjaran,  
Bandung, Indonesia

## \*Correspondence:

Rohman Hikmat  
Nursing Profession Study Program,  
Faculty of Nursing, Universitas  
Padjadjaran, Bandung, Indonesia  
Email: [rohmanhikmat123@gmail.com](mailto:rohmanhikmat123@gmail.com)

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## ABSTRACT

**Background:** Breast cancer become the most incident of cancer among women, especially in Indonesia. Non-pharmacological therapy becomes the additional intervention to address the pain after breast cancer surgery.

**Objective:** The purpose of this study was to determine various non-pharmacological therapeutic interventions that can be performed in pain management in post-operative breast cancer patients.

**Design:** The design used in this literature review is a systematic scoping review.

**Data Sources:** This study used a scoping review system where after obtaining articles from three databases there are CINAHL, Pubmed, and Proquest.

**Review Methods:** The articles will be synthesized and assessed using the clinical appraisal tools of Joanna Briggs Institute (JBI). JBI version of Randomized controlled trial.

**Results:** From the total of 577 articles searched in the database, we obtained seven articles included in the study. The interventions to reduce pain include music therapy and progressive muscle relaxation therapy, acupuncture, foot reflexology, massage and meditation, autology, mindfulness-based cognitive therapy (MBCT), and neuromuscular taping on musculoskeletal (NMT). Apart from relieving pain various interventions that can be done can improve well-being, reduce stress, and reduce the length of treatment or treatment.

**Conclusions:** The result of this study can be an additional intervention that can be applied by nurses and other health care workers.

**Keywords:** management pain; non-pharmacological; breast cancer

## INTRODUCTION

Breast cancer is a type of cancer that attacks the soft tissues of the breast. Breast cancer is formed from abnormal cell growth in the breast and the growth is double (Ataollahi, Sharifi, Paknahad, & Paknahad, 2015). The prevalence of

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- *Non-pharmacological intervention can be solution for nurses and healthcare to reduce pain among post-op breast cancer surgery.*
- *Music therapy, progressive muscle relaxation therapy, acupuncture, foot reflexology, massage and meditation, autology, MBCT, and NMT considering for pain management.*
- *Suggested for nurses and healthcare to implement non-pharmacological intervention as additional treatment.*

breast cancer is 58,256 cases or 16.7% of the total 348,809 cancer cases (Glare et al., 2014). Data from the Global Cancer Observatory 2018 shows that 2.1 million women experience breast cancer every year, and in 2018 there were 2,088,849 new cases, then there were 626,679 women who died from breast cancer, or about 15% of the total deaths who died from cancer (Alkabban & Ferguson, 2022).

Pain is a common symptom that debilitates the condition of breast cancer patients including postoperative pain (Glare et al., 2014). Untreated pain will have an impact on anxiety, depression, hopelessness, the desire to end life, and fear in patients and families (Andersen & Kehlet, 2011). One of the nursing interventions that can be done to reduce pain is pain management (Park et al., 2020). Pain management can be done in two ways, namely through pharmacology and non-pharmacology (Quinlan-Woodward et al., 2016).

One of the non-pharmacological interventions in reducing pain in breast cancer patients is brief pain management. Based on previous research, which carried out a pain management brief to reduce pain scores in breast cancer patients, it was found that there were differences in scores before and after the intervention (Richard, Harbeck, Wuerstein, & Wilhelm, 2019). The effectiveness of pain management is shown by an increase in the Self Efficacy score and a decrease in pain distress and brain recording activity shows that after the intervention session the brain is more resistant to breast cancer pain-related stimuli (Chan, McCarthy, Devenish, Sullivan, & Chan,

2015).

Non-pharmacological interventions can be therapeutic in reducing and controlling pain. Even non-pharmacological interventions can't cause side effects if given properly. Based on these conditions, researchers are interested in reviewing the findings of methods, research, and systematic studies that are expected to provide an overview of non-pharmacological interventions that can be given and carried out to reduce postoperative pain in patients with breast cancer. The purpose of this study is to describe interventions that can be done to reduce postoperative pain in breast cancer patients.

## METHODS

### Design

A systematic scoping review was undertaken. It was a methodological technique that functions to explore new topics that are currently developing rapidly (Tricco et al., 2018). The framework used in this scoping review consists of 5 stages, namely the identification of research questions, identification of relevant study results, study selection, mapping data, compiling, summarizing, and reporting results (Bradbury-Jones et al., 2021).

### Search methods

The databases used in this literature study consisted of CINAHL, PubMed, and ProQuest. The author collects articles on relevant topics after eliminating study results that do not meet the inclusion criteria. The research question is what are the non-pharmacological interventions to reduce postoperative pain in breast cancer patients? The article search process is carried out using several relevant keywords based on PICO. The keywords used in this study were "Breast cancer" OR "mastectomy" AND "Non-Pharmacology" AND "Intervention" OR "Management" OR "Treatment" AND "Post-operative Pain" OR "Acute pain"

### Inclusion and exclusion criteria

This literature review uses PRISMA Extension for Scoping Reviews (PRISM-ScR), which serves to identify various topics that discuss non-pharmacological interventions to treat postoperative pain in breast cancer patients. Articles were selected based on inclusion and exclusion criteria. The inclusion criteria for this study were patients with breast

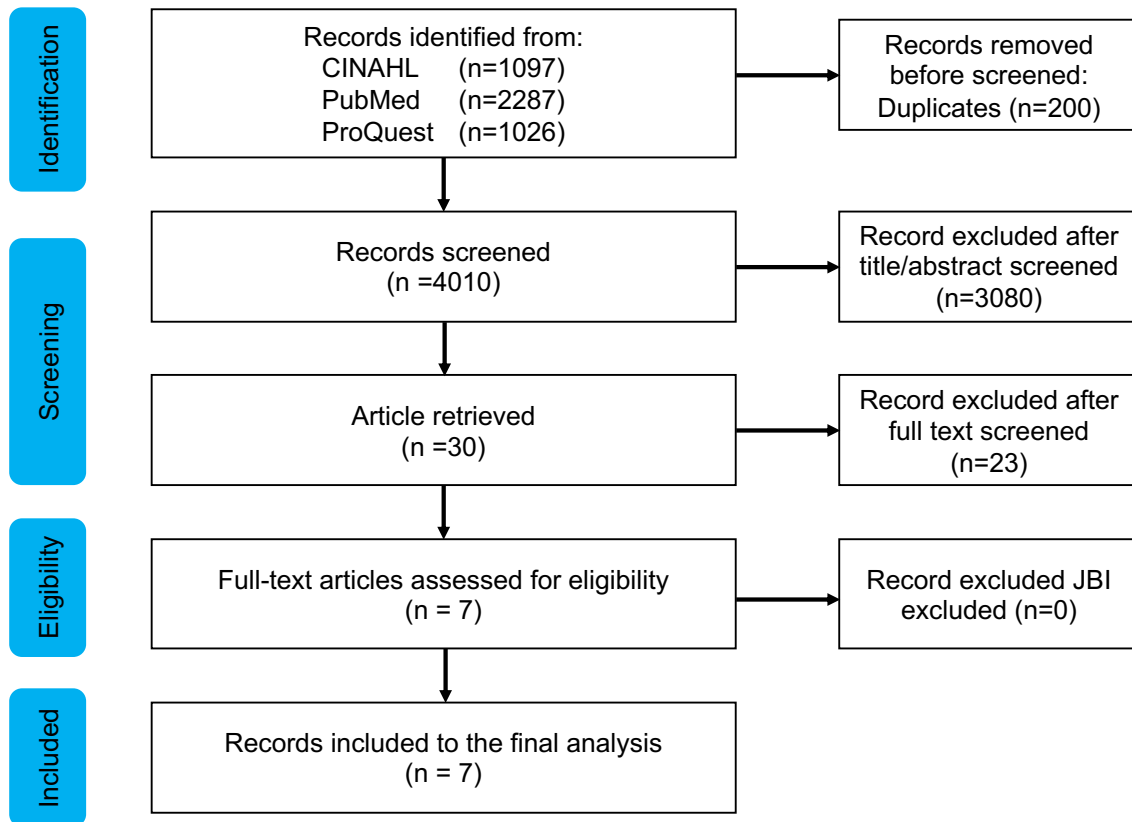


Figure 1. PRIMA flow chart

cancer, the article was a primary study, non-pharmacological interventions to relieve pain, using English, full text, and setting the last 10 years from 2013 to 2022.

### Data extraction

The articles were extracted in tabular form including title, author, year, country, study design, population and sample, procedure, intervention, and important results.

### Quality appraisal

Journals were analyzed using the JBI critical assessment method with good article standards if above 75% based on criteria and topic relevance Table 1.

### Data analysis

The collected articles are then read in full and analyzed. Then after being analyzed, the intervention is classified based on similar interventions and then described.

## RESULTS

The literature used consists of seven articles that discuss postoperative pain management interventions. The results of the extraction of the seven articles obtained were 577 populations. The various pain assessments given in this research article are the visual analogue scale (VAS) and the numeric rating scale (NRS). The research was conducted in the short term and long term. In the short term (12 hours, 48 hours, 3 days) and in the long term (6 weeks, 5 weeks and 8 weeks).

All the characteristic included in this study were patients with breast cancer as survivors, before surgery, after surgery, for both metastatic and non-metastatic cancer. The various interventions given in the research in this article are using music therapy and progressive muscle relaxation therapy to reduce pain, anxiety and length of stay; acupuncture to reduce pain, nausea, anxiety and treat conditions on the first day of surgery and postoperatively; foot reflexology to

**Table 1.** Synthesis and data extraction (n = 7)

Author	Country	Study Design	Sample (n)	Respondents	Intervention	Duration	Tools	Results	JB1
(Zhou et al., 2015)	China	RCT	38	Patients with breast cancer	Music therapy and progressive muscle relaxation training	48 hours	Visual Analogue Scale (VAS)	Music therapy and progressive muscle relaxation training can reduce depression, anxiety and length of stay in female breast cancer patients after radical mastectomy.	84.6% (11/13)
(Quinlan-Woodward et al., 2016)	Chicago	Pilot RCT	120	Patients underwent appendectomy	acupuncture	12 hours	Visual Analogue Scale (VAS)	Acupuncture can reduce pain, nausea, anxiety, and increase the ability to cope on the first postoperative day and pain on the second postoperative day after mastectomy surgery.	76.9% (10/13)
(Ozturk et al., 2018)	Turkey	RCT	120	Patients undergoing appendectomy	Reflexology	3 days	Visual Analogue Scale (VAS)	Foot reflexology is effective for improving well-being and reducing pain in female patients after abdominal hysterectomy.	92.36% (12/13)
(Dion et al., 2016)	USA	Pilot RCT	70	Patients underwent appendectomy	Fast breathing, therapeutic massage and gratitude meditation	3 days	Visual Analogue Scale (VAS)	Postoperative massage is beneficial in patients recovering from surgery. Meditation and massage done through practice to be effective. Meditation and massage should be in cancer patients after recovery from surgery can reduce stress and pain felt by patients.	76.9% (10/13)

**Table 1.** Synthesis and data extraction (n = 7) (continue...)

Author	Country	Study Design	Sample (n)	Respondents	Intervention	Duration	Tools	Results	JB1
(Conejo et al., 2018)	Spain	RCT	40	Patients with breast cancer	Aromatase Inhibitors and Neuromuscular Taping (NMT)	5 weeks	VAS	The results showed that after 5 weeks of NMT therapy, AI-treated patients had an improvement in their pre-existing musculoskeletal symptoms, especially the subjective sensation of pain.	76% (10/13)
(Johannsen et al., 2017)	Denmark	RCT	129	Patient with breast cancer	Mindfulness-based cognitive therapy (MBCT)	8 weeks	Numeric Rating Scale (NRS)	This cost-effective mindfulness-based cognitive therapy (MBCT) for pain reduction is pain-reducing as well as cost-effective with an 85% probability with the additional value of women achieving MCID set to zero remaining cost-effective with a 70% to 82% probability when a smaller effect is assumed and higher cost of MBCT	76% (10/13)
(Shenouda et al., 2022)	Amerika Serikat	RCT	60	Patients with breast cancer	Tart cherry (TC)	6 weeks	Visual Analogue Scale (VAS)	Tart cherries can significantly increase AIA in nonmetastatic breast cancer patients.	76% (10/13)



improve well-being and pain relief; massage and massage to reduce stress and pain; tart cherry (TC) in aromatase inhibitor induced arthralgia (AIA) for reducing musculoskeletal pain mindfulness-based cognitive therapy (MBCT) for pain relief, treatment or medication; and neuromuscular taping on musculoskeletal (NMT) to reduce pain.

The number of articles that can be obtained from the search is 4410 articles. After duplication, there were 210 of the same articles and the remaining 4200 articles. After adjusting for the inclusion and exclusion criteria, there were 122 articles. Then after checking the title and abstract, 9 articles were obtained, and after reading the entire article, 8 articles were obtained which will be synthesized based on the author's name and year of publication, research design, country, sample, and intervention (Figure 1). Researchers conduct and classify the results of article reviews obtained. The result of the analysis is presented in the following table 1.

## DISCUSSION

### Therapy with Media

Therapy by listening to music performed within 48 hours after the radical mastectomy delivered by the researchers using an MP3 player. Music plays twice a day, once in the morning (6-8am) and once in the evening (9pm), Complementary therapy Progressive Muscle Relaxation (PMR) can significantly reduce pain scale in breast cancer patients, this therapy can be done periodically (Erfini et al., 2020).

There is a 15-minute digital video disc (DVD) about fast breathing. When the DVD is finished, the massage therapist instructs the participants in a gratitude meditation. Instructions are followed by individual massage for 20 minutes per session. The therapist signals the patient to do gratitude meditation in the middle of the 20 minutes. After completing the 3-day session, the patient was given a copy of his DVD. They were encouraged to continue practicing meditation until after discharge from the hospital. Yoga can also be a meditation practice that helps improve cognitive function and psychological health for cancer patients and cancer survivors (Z, Rachmawaty, & Syam, 2018).

As well, as with the NMT intervention, collecting clinical data from medical history, grip strength, algometric measurements,

questionnaires, and VAS scales. Three interventions were carried out before the study was completed in 5 weeks. Tapping (tapping) can stimulate fibers in the A-beta nerve which is transmitted to the dorsal column nucleus and nerve impulses that can be transmitted to the lemniscus via collaterals connected to the periaqueductal gray area (PAG). PAG stimulation can produce enkephalin, in the form of opium in the body so that it can reduce pain (Safitri & Machmudah, 2021).

### Therapy with Relaxation

Reflexology is given on the first, second and third postoperative days. Pain levels, anxiety levels were evaluated before surgery, immediately after surgery (30 minutes) and half an hour after surgery (minimum 60 minutes). This form of mindfulness is relaxation. Chang et al stated that the relaxation response activity resulted from a decrease in autonomic and psychological nervous activity, catecholamine and glucocorticoid levels, thereby lowering blood pressure, metabolism, and respiratory rate. So that it affects the autonomic nervous system which in turn can reduce pain intensity (Chang & Asher, 2021; Wilson et al., 2016).

### Traditional Therapy

The acupuncture intervention was given twice during the postoperative hospital at least every 12 hours. In line with the other study, that acupuncture can significantly reduce cancer pain (Andriastuti, Mirasanti, & Nareswari, 2020). The heterogeneity in the results of the meta-analysis occurs due to the varying outcomes of acupuncture, so it is thought that (Safitri & Machmudah, 2021).

### Aromatherapy

Using intervention tart cherry (TC) concentrate in aromatase inhibitor induced arthralgia (AIA) and syrup supplied in vials labeled A or B and dispensed by clinical trial staff conducted for a minimum of 4 weeks and a minimum of 6 weeks of additional pre-planned AIA therapy. According to previous research, there is an effect of combination therapy of progressive muscle relaxation and lemon aromatherapy on reducing the pain scale of cancer patients (Melastuti, Viyanti, & Suyanto, 2021).

Based on the seven intervention articles above, the use of interventions using DVD media watching videos combined with gratitude meditation can significantly reduce pain and

stress experienced by breast cancer sufferers during postoperative recovery (Melastuti et al., 2021; Tola, Chow, & Liang, 2021). It doesn't cost a lot, it doesn't need an expert such as an acupuncturist so that it can be intervened by a nurse, reducing the length of stay, and can be done until the patient returns home to finish his recovery period in the hospital because the video on DVD can be brought home to the patient and can do it again (Wilson et al., 2016; Zhou et al., 2015).

## CONCLUSION

There are seven articles that discuss non-pharmacological interventions that can be used to relieve pain in postoperative breast cancer patients. The interventions that can be done are music therapy and progressive muscle relaxation therapy, acupuncture, foot reflexology, massage and meditation, autology, MBCT, and NMT. Apart from relieving pain, various interventions that can be done can improve well-being, reduce stress, reduce the length of treatment or treatment. The nursing implication in this study is that nurses provide nursing care by taking into account the basic human needs of patients, namely a sense of security and comfort by reducing pain through non-pharmacological interventions. The suggestion from this study is that further research is needed on the factors that cause postoperative pain in breast cancer patients in order to find the most effective non-pharmacological intervention according to the cause.

## Declaration of Interest

None

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## Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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