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# The Effect of Mindfulness on the Physiology and Psychology of Breast Cancer Patients

# Pengaruh Mindfulness terhadap Fisiologis dan Psikologis Pasien Kanker Payudara

Finta Isti Kundarti
Poltekkes Kemenkes Malang, Malang, Indonesia.
Email: fintaistikundarti@gmail.com

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***Abstract***
***Introduction****: Breast cancer is a type of cancer that women often experience. Emotional disturbances, anxiety and depression, are common in breast cancer. It can affect the quality of life of breast cancer. This study aimed to determine the effect of mindfulness on the physiological and psychological well-being of breast cancer.* ***Method:*** *The method used in this study was a systematic review by searching for articles through the Pubmed, ProQuest, Science Direct, Cochrane Library, Wiley Library, and Google Scholar databases with publication years January 2018 to January 2023, and all articles were reviewed using the PRISMA Flowchart.* ***Result****: The results showed that ten articles out of 28,121 met the inclusion criteria the reviewed articles conducted research in six countries with 1,344 breast cancer patients.* ***Conclusion****: Mindfulness interventions reduce anxiety, depression, stress, fatigue, and increase quality of life in breast cancer. The mindfulness intervention has the potential to improve emotion regulation skills.*
***Keywords:***
*Mindfulness; Breast Cancer; Physiological; Psychological*

**Abstrak**
**Pendahuluan**: Kanker payudara merupakan salah satu jenis kanker yang sering dialami oleh wanita. Gangguan emosi, kecemasan dan depresi, sering terjadi pada kanker payudara. Hal ini dapat mempengaruhi kualitas hidup penderita kanker payudara. Penelitian ini bertujuan untuk mengetahui pengaruh mindfulness terhadap kesejahteraan fisiologis dan psikologis penderita kanker payudara. **Metode**: Metode yang digunakan dalam penelitian ini adalah tinjauan sistematis dengan mencari artikel melalui database Pubmed, ProQuest, Science Direct, Cochrane Library, Wiley Library, dan Google Scholar dengan tahun terbit Januari 2018 hingga Januari 2023, dan seluruh artikel direview menggunakan Diagram Alir PRISMA. **Hasil**: Hasil penelitian menunjukkan sepuluh artikel dari 28.121 artikel memenuhi kriteria inklusi. Artikel yang direview melakukan penelitian di enam negara dengan 1.344 pasien kanker payudara. **Kesimpulan**: Intervensi mindfulness mengurangi kecemasan, depresi, stres, kelelahan, dan meningkatkan kualitas hidup pada kanker payudara. Intervensi mindfulness berpotensi meningkatkan keterampilan regulasi emosi.
**Kata Kunci:**
*Mindfulness;* Kanker Payudara; Fisiologis; Psikologis

## INTRODUCTION

Among women, breast cancer is a prevalent form of cancer [1]. Comlications and side effects form cancer and its treatment include gastrointestinal issues, exhaustion, discomfort, and emotional disorders [2;4]. Up to 50% of patients with breast cancer report clinically significant psychological distress [5;6].

About 50% of women with early stage breast cancer experience anxiety, depression, or both within a year of diagnosis. These emotional disturbances are common in breast cancer patients. They correlate with other chronic illnesses, a lack of social support, financial hardships, physical and cognitive impairment, and other chronic diseases [5;7;9]. The possibility of cancer development and recurrence still causes long term concern for patients and survivors, known as cancer resurrence fear, for patients with a good prognosis or those who have finished cancer treatment [10;11]. By promoting tumor growth and boosting the expression of genes related to invasion, pressure serves as a risk factor for the development of cancer [12]. Chronic stress raises catecholamine levels, increases tumor burden, and promotes ovarian cancer cells' invasive development in vivo [13]. Additionally, pancreatic cancer cell spread has been demonstrated to be accelerated by stress-induced hormones [12].

Additionally, bodily issues like exhaustion and discomfort affect their quality of life and ability to function socially [14], [15]. A decline in quality of life among breast cancer patients is linked to anxiety and sadness, according to additional studies [16]. Although these emotional disorders are common and severely threaten patients' physical and mental health, they rarely receive clinical attention. Selective serotonin reuptake inhibitors (SSRIs), which are commonly used to treat emotional issues in breast cancer patients, may raise the mortality rate for the disease [17].

Mindfulness interventions have recently been helpful and provide many benefits in cancer care [18]. Through meditation, yoga, group discussions, and regular contemplative practices, mindfulness-based therapies (MBIs) teach patients how to pay attention to the moment, develop their awareness, and grow compassion. These procedures help people have greater emotional, cognitive, and behavioral control, which eventually contributes to mental stability [18], [19]. The two mindfulness-based cognitive therapies (MBCT) and mindfulness-based stress reduction (MBSR) are the most often used mindfulness interventions. MBCT combines cognitive therapy approaches and offers more obvious psychological education on the connection between mood, cognition, and functioning than MBSR, despite the fact that the two programs' structures are identical [20].

## METHOD

### Study Design, Search Strategy, and Selection Criteria

A literature search identified a systematic review using studies related to mindfulness's physiological and psychological effects. The investigation was conducted through Pubmed, ProQuest, Science Direct, Cochrane Library, Wiley Library, and Google Scholar databases using the keywords Mindfulness AND Breast Cancer.

### Inclusion and Exclusion Criteria

Inclusion criteria:

1. Full-text article
2. Original articles published in English
3. Publication date between January 2018-January 2023
4. Respondents in the study were breast cancer patients
5. Using the Randomized Controlled Trial research method

Exclusion criteria:

1. Narrative review
2. Article published not in English
3. Respondents in the study other than breast cancer patients
4. Using research methods other than

Randomized Controlled Trial

**Quality Appraising**

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) was used for quality assurance purposes to ensure transparent and complete reporting of this systematic review study. Grey literature, duplicate publications, and pieces written in other languages were also excluded. Following a manual search, articles were considered for inclusion if they met the following criteria: (i) they included breast cancer survivors as their primary study population; (ii) they discussed the effects of a mindfulness intervention; and (iii) they had a primary outcome that was connected to the physical and psychological changes experienced by breast cancer patients.

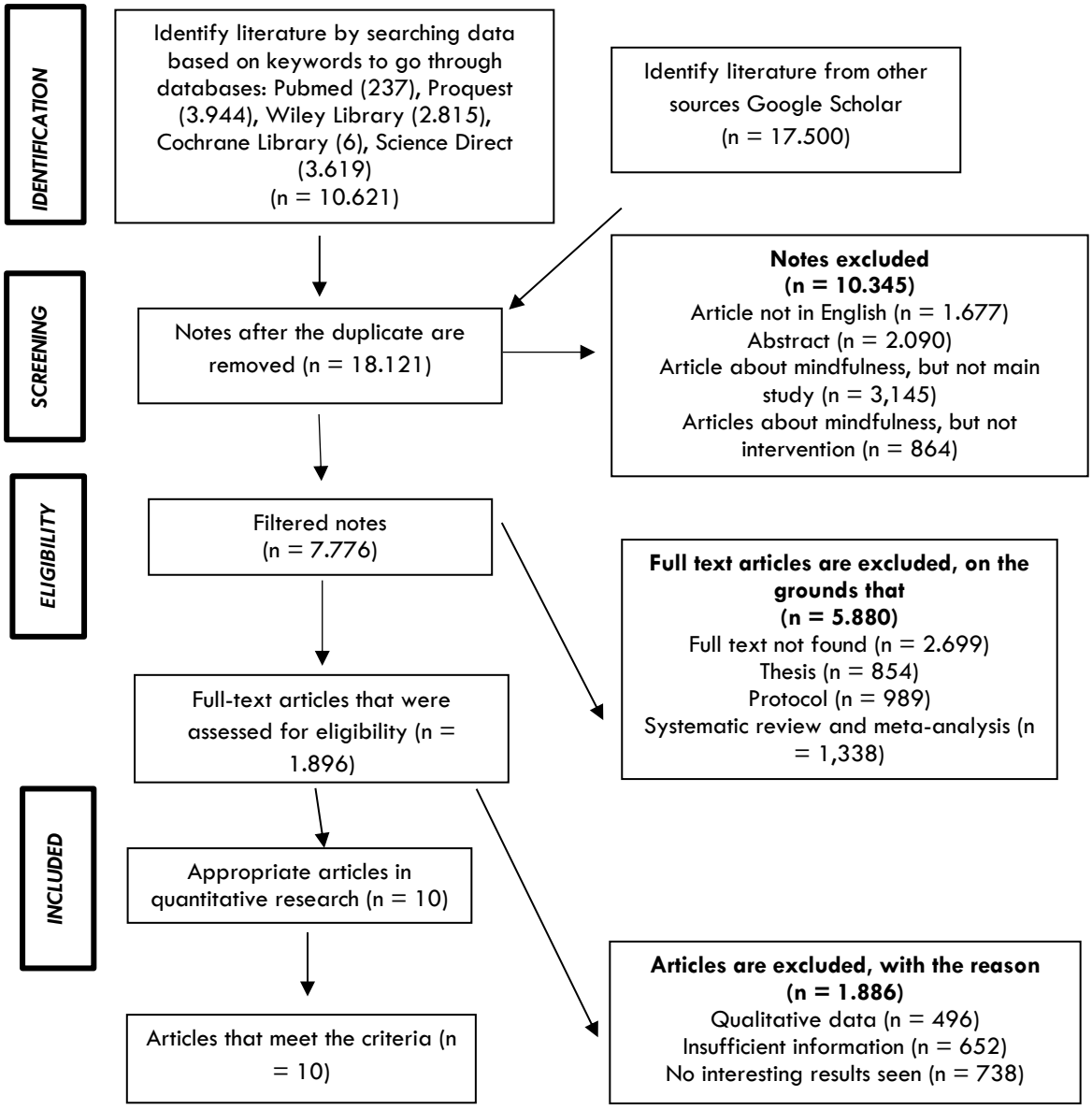


**Figure 1. Prisma Flow Chart**

## RESULT AND DISCUSSION

Through an electronic database search, we found 10.621 citations and another 17.500 entries were found through other sources. Duplicate articles have been excluded by 10.000 articles. of 18.121 articles, 10.345 articles were excluded because the articles were not in English, mindfulness was not a main study and not an intervention. After a number of articles were excluded, 7.776 articles were found. Articles that were not full text, in the form of a thesis or systematic review, were wxcluded as many as 5.880 articles. Full texts for 1.896 citations that were thought to be possibly suitable were collected. Several articles from all full text articles were excluded because they used qualitative data, insufficient information, and no interesting results were seen as many as 1.886 articles. This left 10 articles to be reviewed.

Mindfulness was the primary intervention in this study to assess psychological changes in breast cancer patients. A total of ten studies were reviewed in this study, and all used a randomized controlled trial design [21]-[30]. Four examinations were administered MBSR (Mindfulness-Based Stress Reduction) intervention, and the rest were allocated MBCT (Mindfulness-Based Cognitive Therapy), Mindfulness Yoga, MM (Mindfulness Meditation), Guided Self-Help Intervention Based on Mindfulness (GSH-MBI), Dispositional Mindfulness, and Mindfulness-based Tai Chi Chuan (MTCC). Studies were conducted in several countries, including Japan, China, Turkey, Canada, Denmark, and the United States [21]-[30].

In patients with non-metastatic breast cancer, MBCT psychotherapy significantly decreased psychological distress (anxiety and depression). Additionally, MBCT was successful in lowering FCR (Fear of Cancer Recurrence), increasing QOL (Quality of Life), and reducing fatigue. At four weeks following the end of the treatment, the effects were still there. Following the MBCT intervention, the overall HADS (Hospital Anxiety and Depression Scale) score dropped from 16.13 to 6.18. [21]. Cancer patients are deemed to need psycho-oncological assistance if their HADS total score is 13 or higher [31]. In this study, MBCT brought participants' psychological discomfort down from clinical to subclinical levels. The MBCT trials carried out in mixed cancer populations in the past are to blame for this dramatic improvement in psychological discomfort [32].

Mindfulness yoga can help reduce anxiety and depression. Additionally, it enhances the general physical and mental health as well as the quality of life of patients with early-stage breast cancer. Following the intervention, the HADS anxiety score dropped from 4.56 to 3.18, and the HADS depression score from 4.25 to 3.11 [22]. According to the findings, which were in line with earlier research showing that the experimental group managed anxiety and depressive symptoms better than the control group at the initial assessment, the mindfulness yoga group was deemed statistically and clinically significant for quality of life and reducing depressive symptoms [33]. The effects of mindfulness yoga on psychological outcomes, however, changed over time, with intergroup differences at T1 decreasing at T2, when both groups displayed definite evidence of decline [22]. It is consistent with the results of active cognitive therapy aimed at improving breast cancer patient's mental, physical, and emotional well-being in the same population, where treatment efficacy declined with follow-up [34]. At the conclusion of the MM intervention, the severity scores for fatigue were significantly lower, and this positive trend persisted at the study's follow-up evaluation in week 14. The BFI score dropped from 62.0 to 9.0 (Brief Fatigue Inventory) [23]. Cancer patients' levels of fatigue have decreased as a result of clinical research using MM treatments. For instance, individuals with breast cancer who practiced meditation twice daily for eight weeks saw a considerable improvement in how tired they felt[35]. Meditation has been proven to be an

effective method for managing the disease and enhancing the quality of life by reducing physical and mental symptoms like psychological stress, depression, anxiety, fatigue, and rumination [36].

After the intervention, the MAP (Mindfulness Awareness Practices) intervention dramatically reduced depression symptoms. The rate of clinically significant depression symptoms decreased from 52% at BL (Baseline) to 30% after 3 and 6 months following the intervention, and it was sustained during follow-up [24]. The MAP program produced mild to moderately positive benefits on vasomotor symptoms, fatigue, and insomnia that remained during follow-up [24]. Although mindfulness has been shown to have positive effects on BCS (Breast Cancer Survivors), strong investigations have not yet shown this to be true for younger BCS [37], [38], [39], [40], [41].

The iMBCT intervention reduced breast cancer patients' levels of anxiety and depression immediately after the intervention, with between-group effects maintained mainly at 6-month follow-up for decreased pressure but no change in depression [25]. These values align with a meta-analysis of MBI (Mindfulness Based Intervention) face-to-face groups with cancer patients and the effects found on mood disorders in an online mindfulness-based cancer recovery feasibility study [42]-[44].

In comparison to the control group, women who received the MBSR intervention displayed decreased felt stress levels, fatigue, sleep disruptions, and a predisposition toward depressive symptoms [26]. These findings are in line with earlier studies showing that breast cancer survivors are less stressed when they practice mindfulness [34]. However, MBSR had no impact on breast cancer patient's mental health in a different trial [30].

The GSH-MBI intervention decreased depressive symptoms and disrupted sleep in breast cancer patients by lowering their thoughts and anxieties [27]. The underlying effect of GSH-MBI suggests that two types of recurrent thoughts, frequent rumination and worry, play an intermediary role in the impact of the intervention on depressive symptoms and sleep disturbance. These findings reinforce and extend the results reported in other studies that MBI can reduce repetitive thinking, and changing the process of repetitive thinking is considered the primary mechanism by which MBI is used [45]-[47].

Among BC (Breast Cancer) patients, dispositional mindfulness can considerably lower levels of depression, anxiety, and PTSD (Post Traumatic Stress Disorder) [28]. According to earlier studies, BC patients with high dispositional mindfulness levels expressed fewer unpleasant feelings [28], [48]. Breast cancer patients are able to cope with the disease with a more tolerant attitude and are less affected by negative perceptions of the disease. Therefore, this state of mindfulness may help BC patients feel less stressed, which will help them feel less bad [28].

Patients with breast cancer can experience less stress and anxiety according to the MTCC program [29]. This study provides early evidence that MTCC is appropriate for teenagers and beneficial in lowering depression levels [49]. Interoceptive awareness training during an 8-week TCC exercise can raise awareness levels, which are still detectable at week 24. These results have significant implications for wellness practices and the use of mind-body activities as a supplementary and alternative therapy for emotional problems [50].

The articles reviewed in this study state that mindfulness can affect the physiological and psychological well-being of breast cancer patients, but there is one article that states that mindfulness does not affect the psychological well-being of breast cancer patients. The limitation of this study is that the mindfulness studied is not focused on one type of mindfulness due to the lack of direct research over the past five years on one type of mindfulness

**Table 1. Table Result**

| No | Author | Method | Population | Intervention | Instrument | Result |
|---|---|---|---|---|---|---|
| 1. | Park S, et al., (2020), Japan | Randomized controlled trial | N = 108<br><br>n = 78<br><br>Stage 0-III breast cancer patients | MBCT (Mindfulness-Based Cognitive Therapy)<br><br>The group-based MBCT treatment lasts for eight weeks and two hours per week. | hospital anxiety and depression scale (HADS) | In Japanese patients with non-metastatic breast cancer, MBCT has been proven to enhance the psychological, physical, and mental aspects of health. |
| 2. | Liu w, et al., (2022), China | Randomized controlled trial | N = 178<br><br>n = 136<br><br>Stage I-II breast cancer patients | Yoga Mindfulness<br><br>The experimental group underwent normal therapy for 8 weeks along with 90 minutes of orthodox yoga practice each week. | hospital anxiety and depression scale (HADS) | Early-stage breast cancer patients' general physical and mental health as well as their quality of life can be improved by practicing mindfulness yoga, which also helps to reduce feelings of anxiety and depression. |
| 3. | Gok Metin Z., et al., (2019), Turkey | Randomized controlled trial | N = 130<br><br>n = 92<br><br>Stage I, II, and III breast cancer patients | MM (Mindfulness Meditation) and PMR (Progressive Muscle Relaxation<br><br>The intervention group continued PMR or MM for 20 minutes daily and on the first day for 40 minutes, for a total of 12 weeks in their homes. | Brief COPE and QOL Functional Living Index-Cancer (FLIC) | When started simultaneously with adjuvant paclitaxel, the effective therapies PMR and MM have similar effects on fatigue and coping mechanisms. |
| 4. | Bower J. E., et al., (2021), America | Randomized controlled trial | N = 1,216<br><br>n = 247<br><br>Stage 0, I, II, and III breast cancer patients | Mindfulness Meditation (MM) and Survivorship Education (SE)<br><br>The MAP and SE therapies were carried out in groups that met in person for weekly | Center for Epidemiologic Studies-Depression scale (CES-D) | SE and mindfulness meditation help younger breast cancer survivors with their depressed symptoms. |

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| | | | | 2-hour sessions for a period of six weeks. | | |
| 5. | Nissen E. R., et al., (2019), Denmark | Randomized controlled trial | n = 137<br><br>Breast cancer patients | Internet-delivered mindfulness-based cognitive therapy (iMBCT)<br><br>The iMBCT intervention was given for 6 months with 1 week of therapy and 1 week of rest. | - State-Trait Anxiety Inventory Y-Form (STAI-Y)<br>- Beck Depression Inventory (BDI-II) | iMBCT can reduce anxiety levels in breast cancer patients, but does not affect depression levels in patients. |
| 6. | Janusek L. W., et al., (2019), United States | Randomized controlled trial | N = 1055<br><br>n = 124<br><br>Early-stage breast cancer patients | Mindfulness Based Stress Reduction (MBSR)<br><br>After the fifth week of the 8-week (2.5 hour/week) MBSR intervention, there was a 6-hour silent awareness retreat. | - Perceived Stress Scale (PSS)<br>- Center for Epidemiologic Studies, Depression Scale (CES-D)<br>- Multidimensional Fatigue Scale Inventory – Short Form (MFSI-SF)<br>- Pittsburg Sleep Quality Inventory (PSQI)<br>- Five Facet Mindfulness Questionnaire (FFMQ) | Early MBSR treatment for breast cancer patients has psychological advantages like lowering perceived stress levels and depressive symptoms. |
| 7. | Shao D., et al., (2020), China | Randomized controlled trial | N = 336<br><br>n = 144<br><br>Stage I to IV breast cancer patients | Guided Self-Help Intervention Based on Mindfulness (GSH-MBI)<br><br>GSH-MBI intervention was conducted 5 days a week, for 6 consecutive weeks | The Patient Health Questionnaire, Depression Module (PHQ-9)<br>The General Anxiety Disorder-7 item (GAD-7)<br>The Athens Insomnia Scale<br>The Ruminative Responses Scale<br>The Penn State Worry Questionnaire (PSWQ) | When compared to the wait-list control, the intervention group saw significant reductions in depression symptoms and sleep issues, and these reductions persisted at the 1 and 3-month follow-ups. |
| 8. | Liu X., et al., (2020), China | Randomized controlled trial | n = 230<br><br>Stage 0-III breast cancer patients | Dispositional Mindfulness | Mindfulness Attention Awareness Scale (MAAS) American Medical Association Caregiver Self Assessment Questionnaire (SAQ)<br>Posttraumatic Stress Disorder Symptom Scale (PSS)<br>The Chinese version of the General Anxiety Symptoms Scale (GAD-7)<br>The Chinese version of the Patient Health Questionnaire (PHQ-9) | In breast cancer patients, dispositional mindfulness has a strong negative correlation with distressing feelings like anxiety, despair, and PTSD. |

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|---|---|---|---|---|---|---|
| 9. | Zhang J. Y., et al., (2022), China | Randomized controlled trial | N = 108<br><br>n = 58<br><br>Stage I–III breast cancer | Mindfulness-based Tai Chi Chuan (MTCC)<br><br>The MTCC group received a mindfulness-based Tai Chi Chuan program for 8 weeks twice a week. | The Posttraumatic Growth Inventory-Chinese version (PTGI)<br>The Perceived Stress Scale (PSS)<br>The Self-rating Anxiety Scale (SAS) | Participants' anxiety and stress levels have decreased as a result of the MTCC training. |
| 10. | Shergill Y., et al., (2022), Canada | Randomized controlled trial | N = 144<br><br>n = 98<br><br>Breast cancer patients | Mindfulness-Based Stress Reduction (MBSR)<br><br>The MBSR intervention consists of 8, 2.5-hour weekly sessions along with a full-day retreat (approximately 6 hours) held in the middle of the course on weekends. | the interference subscale of the Brief Pain Inventory Short Form<br>Neuropathic Pain Symptom Inventory (NPSI)<br>Patient Health Questionnaire-9 (PHQ-9)<br>Pain Catastrophizing Scale (PCS)<br>Five Facet Mindfulness Questionnaire (FFMQ)<br>Short-Form-12 Health Survey (SF-12v.2)<br>Profile of Mood States (POMS)<br>Patient Global Impression of Change (PGIC)<br>Perceived Stress Scale (PSS) | The result of the randomized test is that MBSR has no correlation with mental health. |

## CONCLUSION

According to the findings of this systematic review, mindfulness helps breast cancer patients to reduce anxiety, depression, stress, fatigue, and quality of life.

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