

Review

Effectiveness of cognitive behavioral therapy on the mental health of patients with breast cancer: A review

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Abstract: Objective: This review summarizes the effectiveness of cognitive behavioral therapy (CBT) on mental health in patients with breast cancer to support the development of more targeted interventions in future studies. **Methods:** A systematic review was conducted. Literature searches were carried out in the CINAHL, Web of Science, PubMed, and MEDLINE databases in October 2024. Keywords included “breast cancer” and “CBT or cognitive behavioral therapy”. Filters included English language and peer-reviewed articles. Only randomized controlled trials (RCTs) were included. **Results:** Nine studies assessing CBT effectiveness in breast cancer patients were included. CBT was effective in improving mental health, reducing fear of recurrence, alleviating insomnia, and enhancing quality of life. **Conclusion:** Therapist-guided CBT notably reduces anxiety, depression, and fear of recurrence, improving overall life quality. Future studies should focus on high-quality, large-scale trials and longitudinal designs to assess long-term impacts and the sustainability of behavior changes.

Keywords: breast cancer; fear of cancer recurrence; cognitive behavioral therapy; negative emotions

1. Introduction

Breast cancer is a malignant tumor that primarily causes cancer deaths in women worldwide [1]. The disease not only poses a threat to the patient's physical health, but also has a serious impact on his or her psychological state, thus creating a significant double burden [2]. In recent years, the prognosis for survival from breast cancer has improved significantly with advances in diagnostic techniques and treatment, especially in non-metastatic cases. Globally, the five-year survival rate for breast cancer patients has risen to approximately 89% [3], with survival rates as high as 99% for confined tumors and 84% for regional metastases [4]. The disease threatens the patient's physical health while seriously affecting the patient's psychological state, resulting in a heavy double burden.

With continued advances in cancer diagnostic and treatment technologies, breast cancer survivors' average life expectancy has been extended to nearly 23 years, marking a significant improvement in their long-term prognosis [5]. Nevertheless, survival does not equate to complete recovery, as many survivors continue to endure substantial emotional and psychological burdens. These often manifest as anxiety, depression, or a persistent fear of recurrence, severely affecting their quality of life [6].

The preferred standard treatment option for breast cancer is surgery, which removes the primary tumor and, if necessary, the involved lymph nodes.

Subsequently, based on tumor stage and biology, patients usually receive adjuvant treatments including chemotherapy [7], radiotherapy [8], and hormone-based endocrine therapy [9], depending on the cancer stage and biological characteristics. While these interventions significantly improve disease control and reduce recurrence risk, they are often accompanied by a range of side effects and complications.

Breast cancer patients who undergo surgery may suffer damage to their physical appearance and dignity from mastectomy or breast-conserving procedures. Also, chemotherapy is often accompanied by side effects such as vomiting, fatigue and hair loss [10–12]. Radiotherapy, although localized, can result in adverse skin reactions, inflammation, and tissue fibrosis [13]. Moreover, endocrine therapy, typically administered over several years, may lead to long-term metabolic issues including obesity, osteoporosis, and joint pain [14,15].

The cumulative impact of these treatment-related physical discomforts often deepens the psychological distress already associated with a cancer diagnosis, contributing to a vicious cycle wherein physical ailments exacerbate mental health struggles and vice versa. This underscores the critical importance of integrating psychosocial care and supportive therapies into the holistic management of breast cancer patients.

Breast cancer diagnosis and treatment brings with it a variety of serious physical and psychological side effects that can affect a patient's overall health. Common physical symptoms include chronic pain, decreased physical functioning, persistent fatigue, sleep disturbances, and hair loss, most of which stem directly from conventional therapies including surgery, chemotherapy, radiotherapy, and endocrine therapy [16–18]. The aforementioned physical discomforts not only impair patients' physical health, but also significantly increase their exposure to psychological disorders, especially anxiety and depression. For patients undergoing radical mastectomy, changes in body image often trigger impaired self-esteem and severe psychological trauma. In addition, the long duration and toxicity of chemotherapy often further exacerbate these negative experiences, creating a heavy burden on both the physical and psychological levels.

Personalized therapeutic approaches are becoming increasingly important in clinical oncology given the biological complexity and heterogeneity of breast cancer. However, despite the development of individualized treatment strategies, a considerable proportion of patients—estimated at one-third—experience significant psychological distress during treatment. This distress primarily manifests as depression or anxiety [19,20], and may persist well beyond the completion of therapy, often lasting several years [21–23]. Depression appears to be a common comorbidity among breast cancer patients, with prevalence rates ranging from 9.4% to 65.1% [24], and severe cases observed in up to 22% of patients—but also a critical prognostic factor linked to higher cancer recurrence and increased mortality [23].

Chronic pain is another major concern, described as a complex sensory and emotional experience often involving cognitive processes [25]. A meta-analysis of research showed that about 44.5 per cent of breast cancer survivors had reported persistent pain, with 30.6 per cent of them suffering from moderate to severe pain [26]. Fatigue, another common and debilitating symptom, affects 26.9% to 43% of patients during or after treatment [27], greatly diminishing quality of life and impeding post-treatment adaptation [28].

In addition to the effects described above, the fear of cancer recurrence (FCR) is an ongoing concern for many breast cancer patients. FCR is characterized by

anxiety over the potential return or progression of the disease, and is reported to affect between 22% and 87% of cancer survivors [29]. While a certain level of FCR is a natural response, higher levels of anxiety and depression can push this fear beyond normal thresholds [30,31], and significantly affects patients' quality of life [32]. Another frequent issue is Cancer-related fatigue (CRF), interfering with daily functioning [33,34], and reported in up to 90% patients undergoing chemotherapy [35], and lasts for years after treatment [36].

Sleep disturbances are also highly prevalent and can begin even before surgery. Many patients report poor sleep quality during chemotherapy [37], and during antihormonal treatment [38]. Insomnia, in particular, is defined as difficulty falling asleep or frequent nighttime awakenings, often resulting in reduced daytime functioning. When persistent for over a month, insomnia becomes a clinically significant syndrome that negatively impacts overall health [39].

Cognitive Behavioural Therapy (CBT) has been proposed to manage these symptoms and is an effective non-pharmacological intervention. For example, CBT treatments for insomnia include techniques known as stimulus control, sleep restriction and sleep hygiene—initially developed by Bootzin [40]—and has shown significant success in improving both sleep quality and mood [41]. While CBT is widely used for the treatment of general psychiatric symptoms, research specifically addressing its long-term benefits in early-stage breast cancer patients and survivors with insomnia, anxiety, and depression remains limited. There is a growing need for longitudinal studies to further validate the effectiveness of CBT in these subpopulations.

Interventions have evolved over time and this study aims to address the prevalence and severity of psychological symptoms associated with breast cancer and to improve the quality of life (QOL) of breast cancer patients. A variety of non-pharmacological treatments—including psychoeducation, mindfulness, aerobic exercise, and behavioral therapies—have demonstrated beneficial effects in alleviating mental health issues [42,43]. Although pharmacological approaches such as antidepressants, anxiolytics, and other psychotropic drugs are often prescribed, their use is limited by adverse side effects [44]. As a result, the focus has shifted toward safer, evidence-based non-drug interventions. In alignment with this shift, the World Health Organization (WHO) has emphasized the integration of psychosocial support into routine cancer care [45].

CBT stands out amongst various psychological interventions for its structured, problem-centred approach and has demonstrated strong efficacy in targeting irrational thought patterns associated with distress. Delivered through individual or group sessions, or via digital platforms, CBT helps patients acquire skills to manage dysfunctional beliefs and behaviors [46]. Significant improvement in depression and anxiety symptoms in breast cancer patients after CBT intervention reported in several studies [47,48]. Notably, Antoni et al. demonstrated that CBT's positive impact on anxiety symptoms can last up to 12 months [48], while improvements in depression and QOL have been observed for as long as 15 years post-treatment [49]. In addition, Howell and colleagues found that CBT can effectively improve sleep quality and reduce insomnia among cancer patients [50].

In this context, the present review aims to systematically evaluate the effectiveness of CBT in addressing psychological symptoms among breast cancer patients, with a specific focus on anxiety, depression, insomnia, and FCR. By synthesizing current empirical evidence, this study seeks to inform the development

of more precise, accessible, and sustainable psychosocial interventions in breast cancer care.

2. Methods

2.1 Searching strategy

This study is a systematic review. We performed a literature search in the CINAHL, Web of Science, pubmed and MEDLINE databases. The databases were searched on 10/2024. The keywords used in the search were “breast cancer” and “CBT or cognitive behavioral therapy”. Search restrictions included “English” and “peer-reviewed”. Article types include randomized controlled study (RCT).

To identify relevant literature, the authors conducted a comprehensive search of the Medical Subject Headings (MeSH) database to extract appropriate keywords. The search strategy included the following MeSH terms:

“Cognitive Behavioral Therapy” OR “Cognitive Behavioral Therapies” OR “Cognitive Therapy” OR “Cognition Therapy” OR “Behavioral Therapy” OR “Behavior Therapy”, combined with “Depression” OR “Depressive Symptoms” OR “Depressive Disorder” OR “Anxiety” OR “Anxiety Disorders” OR “Anxiety Symptoms”, and “Breast Cancer” OR “Breast Neoplasms” OR “Breast Malignant Neoplasm” OR “Breast Tumor” OR “Breast Carcinoma” OR “Breast Carcinomas” OR “Survivors” OR “Long-Term Survivors” OR “Survivorship”. To ensure methodological rigor, the search was further limited to publications classified as “Randomized Controlled Trials” [Publication Type]. No time restrictions were applied.

In PubMed, the search strategy utilized a combination of title and abstract terms (TIAB) as follows:

(breast cancer [TIAB] OR breast neoplasm* [TIAB] OR breast tumor [TIAB] OR breast carcinoma [TIAB] OR breast cancer survivors [TIAB]) AND (anxiety [TIAB] OR anxiety symptoms [TIAB] OR depression [TIAB] OR depressive symptoms [TIAB] OR insomnia symptoms [TIAB] OR fear of cancer recurrence [TIAB]) AND

(cognitive behavioral therapy* [TIAB] OR cognitive behavioral group therapy* [TIAB]).

2.2 Inclusion and exclusion criteria of the literature

This study established clear and rigorous inclusion and exclusion criteria to enhance the scientific rigor of the literature selection process and ensure the reliability and validity of the results. The inclusion criteria were specifically designed to select high-quality studies that are methodologically sound and relevant to the research objective. First, only studies classified as independent randomized controlled trials (RCTs) or systematic reviews were considered, as these designs are widely recognized for their ability to provide strong evidence on the effectiveness of interventions. Second, the included studies are required to include breast cancer participants confirmed by pathology, so as to ensure the consistency of the selected literatures in the diagnostic criteria. Third, the studies needed to present sufficient statistical data or provide adequate information from which the necessary data could be extracted or computed. This requirement was essential for conducting meaningful analysis and comparison across studies. By adhering to these strict criteria, the review aimed to minimize bias, improve the generalizability of the findings, and provide a robust foundation for drawing conclusions about the effectiveness of the interventions

under investigation.

The exclusion criteria were carefully defined to eliminate studies that might compromise the accuracy, relevance, or integrity of the systematic review. Specifically, the criteria included the following: (i) studies involving participants with comorbid medical conditions in addition to breast cancer, such as traumatic brain injury, severe cognitive impairment, or other psychiatric or physical disorders that could confound psychological or physiological outcomes; (ii) non-peer-reviewed or unofficial research literature, including case reports, conference abstracts, commentaries, editorials, and research protocols, which typically lack sufficient methodological detail or standardized outcome measures; (iii) studies that did not align with the defined inclusion criteria in terms of population (e.g., not breast cancer patients), study design (e.g., observational or quasi-experimental studies), intervention type (e.g., interventions unrelated to CBT), or outcome indicators (e.g., studies lacking mental health-related endpoints); (iv) articles for which the full text was inaccessible or from which essential data could not be extracted, and for which contact with the original authors failed to yield the necessary information; and (v) duplicate publications or studies with overlapping data sets, in which case only the most complete and recent version was retained.

In parallel with the exclusion process, a systematic approach was employed to assess the methodological quality of the included studies using established quality appraisal tools. Data extraction was carried out in a structured manner to collect relevant information such as sample size, intervention type, duration, outcome measures, and key findings. This rigorous selection and assessment framework ensured that only studies of sufficient scientific quality were included, thereby enhancing the credibility and practical applicability of the review's conclusions. Ultimately, this process laid a solid foundation for a comprehensive and evidence-based analysis of the effectiveness of cognitive behavioral therapy in improving mental health outcomes among breast cancer patients.

2.3 Quality assessment and data extraction

Two researchers independently screened and rescreened the literature according to the established inclusion and exclusion criteria, and completed data extraction. The screening process included title screening, abstract review, confirmation of research subject characteristics, evaluation of research tools and parameters, and comprehensive judgment of the full text. After completing the above steps, the researchers conducted a cross-check to ensure the consistency of the literature screening results and the accuracy of data extraction. This process is designed to minimize subjective bias and improve the reliability and scientificity of the research.

Subsequently, two evaluators independently evaluated the final included literature based on the bias risk assessment tool provided in the Cochrane Manual for Systematic Reviewers version 5.1.0. The main evaluation criteria include: (1) whether the random sequence generation is reasonable; (2) whether the allocation concealment measures are in place; (3) whether the researchers and subjects are double-blinded; (4) whether the outcome assessors are blinded; (5) whether the data are complete and not missing; (6) whether there is selective reporting bias; and (7) whether there are other potential biases. Based on the degree of adherence to the evaluation criteria, the included studies were categorized into three levels of methodological quality: studies that fully satisfied all criteria were rated as Grade A, those that partially met the criteria were rated as Grade B, and those that failed to meet key criteria were rated as Grade C. Ultimately, nine studies were included in the review, of which six were

classified as Grade A and three as Grade B. (see **Figure 1**).

	van de W. M et al., 2017	S. M et al., 2021	Pn et al., 2017	Michael H. Antoni, 2009	Le et al., 2016	J. F et al., 2022	F. D et al., 2020	C) et al., 2012	B. R et al., 2019	
Random sequence generation (selection bias)	+	+	+	?	+	+	+	+	+	
Allocation concealment (selection bias)	+	+	+	?	+	+	+	+	+	
Blinding of participants and personnel (performance bias)	+	+	+	?	+	+	+	+	+	
Blinding of outcome assessment (detection bias)	+	?	+	+	?	+	+	+	+	
Incomplete outcome data (attrition bias)	+	+	+	+	+	+	+	+	+	
Selective reporting (reporting bias)	+	+	+	+	+	+	+	+	+	
Other bias	+	+	+	+	+	+	+	+	+	

Figure 1. Risk of bias summary.

3. Results

3.1 Efficacy of CBT on negative emotions in patients with breast cancer

Several studies have examined the psychological benefits of CBT for breast cancer patients. In one randomized controlled trial, patients were assigned to either a Cognitive Behavioral Stress Management (CBSM) group program in addition to standard care, or to standard care alone. Assessments conducted post-intervention and at 12-month follow-up showed significant reductions in overall stress and anxiety in the intervention group compared to controls, highlighting the superior and sustained benefits of CBT-based approaches [51]. Similarly, another RCT involving 130 participants compared a 9-week structured CBT program (90 min per session) to conventional care. The CBT group experienced marked improvements in sleep quality, as well as reductions in depression and anxiety symptoms, with effects persisting through week 26 [52], suggesting that longer-duration and structured CBT protocols may yield more durable outcomes.

Further evidence supports the effectiveness of group-based CBT in enhancing mental health and quality of life (QOL) among breast cancer patients. One study demonstrated that group CBT significantly improved psychological well-being and reduced negative emotional states, while also allowing for individualized intervention strategies tailored to patients' specific psychological needs [53].

However, findings from a meta-analysis of eight studies involving 1053 patients present a more nuanced picture. While CBT was associated with significant reductions in anxiety ($p = 0.04$), its effects on depression and quality of life were not statistically significant ($p > 0.05$). These results underscore the need for standardized intervention protocols and more rigorous clinical trial designs to fully elucidate CBT's therapeutic

potential in this population [54].

3.2 Effectiveness of CBT for treating patients with breast cancer insomnia symptoms

Insomnia can have a significant impact on the patients with breast cancer's daily life and emotional state. Researchers combined positive thinking meditation and insomnia CBT to develop ICBT for insomnia patients with breast cancer. The Positive Thinking Intervention consists of a 6-week online, self-directed learning module on techniques for self-management of sleep based on positive thinking to increase total sleep time and improve sleep efficiency. Each module contains instruction on positive thinking meditation and sleep using multiple forms of content. Each module lasts approximately 20 min [55]. After 6 weeks of intervention, the intervention group experienced sustained and significant improvements in insomnia and fatigue symptoms. This study utilized a self-administered research design and methodology to innovatively address sleep problems in cancer survivors. The study design and methodology were cost-effective and effective for patients with breast cancer. Future studies could also conduct larger research trials to help guide and improve the design. A systematic review encompassing 16 trials and a total of 1523 cancer patients demonstrated that cognitive behavioral therapy for insomnia (CBT-I) significantly alleviates insomnia symptoms [56]. Compared to non-intervention controls, CBT-I led to substantial reductions in insomnia severity (MD = -12.29, 95% CI: -16.48 to -8.09) and wake after sleep onset (WASO) (MD = -16.58, 95% CI: -22.00 to -11.15), while improving sleep efficiency (MD = 7.62%, 95% CI: 5.82% to 9.41%). Compared to active control conditions, CBT-I also showed significant benefits across multiple sleep parameters. However, its therapeutic efficacy tended to diminish over time, with effects largely attenuated during long-term follow-up. The overall quality of evidence supporting these findings ranged from moderate to low. Further results from a network meta-analysis indicated that CBT-I increased sleep efficiency by 10.61% relative to non-intervention groups, with this benefit sustained in short-term follow-up. These findings suggest that while CBT-I is effective in improving sleep immediately post-intervention, its long-term durability remains limited, warranting further investigation into strategies for maintaining treatment gains over time. However, due to the relatively poor quality and limited sample size of the available evidence, high-quality large-scale trials and long-term follow-up data are still needed to further validate its efficacy.

3.3 Effectiveness of CBT on FCR in patients with breast cancer

Among the various forms of psychological distress experienced by patients with breast cancer, FCR is recognized as one of the issues that have a lasting and widespread impact on patients [57,58]. FCR is often defined as "fear, worry, or apprehension about the recurrence or progression of cancer" [29]. About 50% of patients report moderate or greater FCR. Some studies have also reported that up to 70% of patients with breast cancer are accompanied by FCR [59]. In particular, past research found that breast cancer patients with FCR adopt inappropriate coping strategies (denial, avoidance, excessive, intrusive thinking, or self-blame) [60,61]. Intrusive thoughts can even persist years after treatment has ended. Although patients have a longer life expectancy after treatment, if their psychological symptoms do not improve, fear may continue to affect their lives and reduce patients' quality of life [62].

Since FCR is a major contributor to psychological distress among breast cancer patients, it has been identified as a critical target for psychological intervention to improve patient prognosis [63]. Compared to usual care, CBT has demonstrated

superior efficacy in reducing FCR [64]. Despite variations in theoretical foundations, delivery formats, and therapeutic techniques, most current FCR interventions are grounded in CBT principles [65]. Specifically, CBT approaches incorporating problem-solving therapy and behavioral activation have proven effective in mitigating FCR, suggesting that CBT enables patients to develop more adaptive coping mechanisms in response to recurrence-related fears [66]. Additionally, several CBT-derived interventions have shown promising outcomes in lowering FCR among breast cancer survivors [67]. Notably, acceptance and commitment therapy (ACT), which encourages patients to live in accordance with personal values while accepting distressing thoughts, has been found to promote more adaptive management of FCR [68]. Approaches based on positive thinking typically emphasize awareness and help patients relax and disengage from entrenched thought patterns [69]. Recent research has found that positive thinking interventions, as a form of coping, are effective in reducing anxiety, stress, and general mood and enhancing QOL for patients with breast cancer [70]. Evidence from compassion-based interventions aimed at developing cognitive habits of empathy also suggests that these interventions may provide patients with breast cancer with useful skills to prevent FCR [71]. Compassion-based interventions aimed at developing empathic cognitive habits have also been shown to provide patients with breast cancer with useful skills to prevent FCR [72]. A meta-analysis of 13 RCTs, encompassing a total of 1447 breast cancer patients and survivors, demonstrated that CBT significantly reduced FCR (effect size: $g = -0.44$, 95% CI: -0.75 to -0.13 , $p < 0.001$). Notably, among the various CBT modalities, only mindfulness-based cognitive therapy yielded statistically significant effects. Although the included studies found a high risk of overall bias, the results of these studies indicate that CBT can be an intervention for the management of FCR. Future research should aim to compare the relative efficacy of different CBT approaches through rigorously designed trials.

3.4 Limitations and directions for future research

This review also has some limitations. First, this article ignores the impact of cultural factors. In different cultural backgrounds, the treatment plans for breast cancer patients may be different. Second, this review only discusses the impact of CBT on breast cancer patients, and the impact on different types of diseases needs to be further confirmed. Third, this article is a qualitative study with limited included literature, which may lead to inaccurate conclusions. Fourth, the discussion topics are limited, for the patient's psychological status, family functions and other factors need to be considered. Fifth, inclusion of the potential for self-report bias given that all tests are self-reported. This may lead to a stable outcome. To further investigate this issue, it is necessary to include a large sample in future studies that can combine online and offline modalities to explore more effective and less costly methods. Similarly, there is a lack of consistency in determining intervention duration, and short- and long-term intervention designs are needed to explore more appropriate intervention duration. At the same time, future studies could explore the neural mechanisms behind the intervention and further improve the effectiveness of CBT in breast cancer patients.

4. Conclusion

This study found that cognitive behavioral therapy (CBT), especially under the guidance of a professional therapist, significantly relieved cancer patients' anxiety, depression, and fear of cancer recurrence. In addition, CBT significantly improved

patients' overall QOL by enhancing their mental toughness and coping skills. These findings underscore the clinical relevance of CBT as a non-pharmacological intervention in the comprehensive care of individuals with cancer.

Nonetheless, despite the preliminary evidence supporting its efficacy, current research is constrained by several limitations, including small sample sizes, variable methodological quality, and short follow-up durations. Therefore, future investigations should prioritize the implementation of large-scale, high-quality randomized controlled trials to further substantiate the effectiveness and generalizability of CBT across diverse cancer populations and disease stages.

In addition, it is recommended that longitudinal study designs be employed to examine the long-term outcomes of CBT interventions. Such designs would provide valuable insights into the sustainability of psychological improvements and behavioral changes induced by CBT, thereby contributing to the development of more personalized and enduring psychosocial support strategies throughout the cancer care continuum.

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References

1. F B, J F, I S, R I S, L a T, A J. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*. 2018;68. doi:10.3322/caac.21492
2. Margeli Vila M, del Barco Berron S, Gil-Gil M, Ochoa-Arnedo C, Villanueva Vazquez R. Psychosocial aspects and life project disruption in young women diagnosed with metastatic hormone-sensitive HER2-negative breast cancer. *Breast*. 2020;53: 44–50. doi:10.1016/j.breast.2020.06.007
3. Chetrit A, Ben-Avraham S, Mandelzweig L, Amitai T, Danieli NS, Silverman B, et al. Breast cancer survivors: Physical and mental quality of life 10 years following diagnosis, a case-control study. *Breast Cancer Res Treat*. 2021;188: 273–282. doi:10.1007/s10549-021-06156-0
4. Maajani K, Jalali A, Alipour S, Khodadost M, Tohidinik HR, Yazdani K. The global and regional survival rate of women with breast cancer: A systematic review and meta-analysis. *Clin Breast Cancer*. 2019;19: 165–177. doi:10.1016/j.clbc.2019.01.006
5. Wu T-Y, Chung C-H, Lin C-N, Hwang J-S, Wang J-D. Lifetime risks, loss of life expectancy, and health care expenditures for 19 types of cancer in taiwan. *Clinical Epidemiology*. 2018;10: 581–591. doi:10.2147/CLEP.S155601
6. S P, Yt T, Hc K, Yl W, T Y, Sy F, et al. Higher risk of depression after total mastectomy versus breast reconstruction among adult women with breast cancer: A systematic review and metaregression. *Clinical breast cancer*. 2021;21. doi:10.1016/

- j.clbc.2021.01.003
7. Denduluri N, Chavez-MacGregor M, Telli ML, Eisen A, Graff SL, Hassett MJ, et al. Selection of optimal adjuvant chemotherapy and targeted therapy for early breast cancer: ASCO clinical practice guideline focused update. *Journal of Clinical Oncology*. 2018 [cited 10 Dec 2024]. doi:10.1200/JCO.2018.78.8604
8. Recht A, Comen EA, Fine RE, Fleming GF, Hardenbergh PH, Ho AY, et al. Postmastectomy radiotherapy: An American society of clinical oncology, american society for radiation oncology, and society of surgical oncology focused guideline update. *Pract Radiat Oncol*. 2016;6: e219–e234. doi:10.1016/j.prro.2016.08.009
9. Burstein HJ, Lacchetti C, Anderson H, Buchholz TA, Davidson NE, Gelmon KA, et al. Adjuvant endocrine therapy for women with hormone receptor–positive breast cancer: ASCO clinical practice guideline focused update. *Journal of Clinical Oncology*. 2019 [cited 10 Dec 2024]. doi:10.1200/JCO.18.01160
10. Kang D, Kim I-R, Choi E-K, Im YH, Park YH, Ahn JS, et al. Permanent chemotherapy-induced alopecia in patients with breast cancer: A 3-year prospective cohort study. *Oncologist*. 2019;24: 414–420. doi:10.1634/theoncologist.2018-0184
11. Naito Y, Kai Y, Ishikawa T, Fujita T, Uehara K, Doihara H, et al. Chemotherapy-induced nausea and vomiting in patients with breast cancer: A prospective cohort study. *Breast Cancer*. 2020;27: 122–128. doi:10.1007/s12282-019-01001-1
12. Eghbali M, Yekaninejad MS, Varaei S, Jalalinia SF, Samimi MA, Sa’atchi K. The effect of auricular acupressure on nausea and vomiting caused by chemotherapy among breast cancer patients. *Complement Ther Clin Pract*. 2016;24: 189–194. doi:10.1016/j.ctcp.2016.06.006
13. Yee C, Wang K, Asthana R, Drost L, Lam H, Lee J, et al. Radiation-induced skin toxicity in breast cancer patients: A systematic review of randomized trials. *Clinical Breast Cancer*. 2018;18: e825–e840. doi:10.1016/j.clbc.2018.06.015
14. Denosumab for bone health in prostate and breast cancer patients receiving endocrine therapy? A systematic review and a meta-analysis of randomized trials. *Journal of Bone Oncology*. 2019;18: 100252. doi:10.1016/j.jbo.2019.100252
15. Wellberg EA, Kabos P, Gillen AE, Jacobsen BM, Brechbuhl HM, Johnson SJ, et al. FGFR1 underlies obesity-associated progression of estrogen receptor–positive breast cancer after estrogen deprivation. *JCI Insight*. 2018;3: e120594. doi:10.1172/jci.insight.120594
16. M DT. Anxiety and sleep disorders in cancer patients. *EJC supplements : EJC : official journal of EORTC, European Organization for Research and Treatment of Cancer* . [et al]. 2013;11. doi:10.1016/j.ejcsup.2013.07.009
17. M HB, Ja C. A longitudinal study on anxiety, depressive and adjustment disorder, suicide ideation and symptoms of emotional distress in patients with cancer undergoing radiotherapy. *Journal of psychosomatic research*. 2016;87. doi:10.1016/j.jpsychores.2016.05.010
18. Tojal C, Costa R. Depressive symptoms and mental adjustment in women with breast cancer. *Psycho-Oncology*. 2015;24: 1060–1065. doi:10.1002/pon.3765
19. D D, J F, Rd E, L K-G, M S, V A. Anxiety and depression in cancer patients and survivors in the context of restrictions in contact and oncological care during the COVID-19 pandemic. *International journal of cancer*. 2025;156. doi:10.1002/ijc.35204
20. N R, Dg H, M H, Pv L, A N, Pe B, et al. Depressive symptom trajectories in women affected by breast cancer and their male partners: A nationwide prospective cohort study. *Journal of cancer survivorship : research and practice*. 2016;10. doi:10.1007/s11764-016-0538-3
21. P H, G S, J M, J H, Jm B. The course of anxiety and depression over 5 years of follow-up and risk factors in women with early breast cancer: Results from the UK standardisation of radiotherapy trials (START). *Breast (Edinburgh, Scotland)*. 2010;19. doi:10.1016/j.breast.2009.11.007
22. Ciria-Suarez L, Jiménez-Fonseca P, Palacín-Lois M, Antoñanzas-Basa M, Fernández-Montes A, Manzano-Fernández A, et al. Breast cancer patient experiences through a journey map: A qualitative study. *PLoS One*. 2021;16: e0257680. doi:10.1371/journal.pone.0257680
23. Sw M, C R, Aj B, Pf V, Gh de B. The prevalence of long-term symptoms of depression and anxiety after breast cancer treatment: A systematic review. *Maturitas*. 2015;82. doi:10.1016/j.maturitas.2015.04.010
24. X W, N W, L Z, S W, Y Z, B Y, et al. Prognostic value of depression and anxiety on breast cancer recurrence and mortality: A systematic review and meta-analysis of 282,203 patients. *Molecular psychiatry*. 2020;25. doi:10.1038/s41380-020-00865-6
25. Ma L, S K, Lm M, Tc K, H S, Bc Y. Emotional awareness and other emotional processes: Implications for the assessment and treatment of chronic pain. *Pain management*. 2021;11. doi:10.2217/pmt-2020-0081
26. Rah S, L B, M T, Mhj van den BE. Update on prevalence of pain in patients with cancer 2022: A systematic literature review

- and meta-analysis. *Cancers*. 2023;15. doi:10.3390/cancers15030591
27. A Á-B, Cg de P, M R-E, J R, P O, B C, et al. Prevalence and correlates of cancer-related fatigue in breast cancer survivors. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2021;29. doi:10.1007/s00520-021-06218-5
28. Hjj A, Mfm G, Ic S, Cahhvm V, Mm R, H K. Risk factors, prevalence, and course of severe fatigue after breast cancer treatment: A meta-analysis involving 12 327 breast cancer survivors. *Annals of oncology : official journal of the European Society for Medical Oncology*. 2016;27. doi:10.1093/annonc/mdw099
29. S S, B T, G H, M D, C H, S M, et al. Fear of cancer recurrence in adult cancer survivors: A systematic review of quantitative studies. *Journal of cancer survivorship : research and practice*. 2013;7. doi:10.1007/s11764-013-0272-z
30. Crist JV, Grunfeld EA. Factors reported to influence fear of recurrence in cancer patients: A systematic review. *Psycho-Oncology*. 2013;22: 978–986. doi:10.1002/pon.3114
31. L K, L J, H B, V A. Fear of recurrence and disease progression in long-term (≥ 5 years) cancer survivors--a systematic review of quantitative studies. *Psycho-oncology*. 2013;22. doi:10.1002/pon.3022
32. Ms M-R, S H, I A, B de V, A R-L, T R, et al. One-year quality of life outcomes of delayed unilateral autologous breast reconstruction and associated patient factors. *JPRAS open*. 2024;43. doi:10.1016/j.jptra.2024.10.014
33. Jones JM, Olson K, Catton P, Catton CN, Fleshner NE, Krzyzanowska MK, et al. Cancer-related fatigue and associated disability in post-treatment cancer survivors. *J Cancer Surviv*. 2016;10: 51–61. doi:10.1007/s11764-015-0450-2
34. Sa R, H P, D S, Sc T, Es Z, A W, et al. Incidence of patient-reported fatigue developing on palbociclib and endocrine therapy for advanced HR+ HER2- breast cancer. *The oncologist*. 2024 [cited 21 Dec 2024]. doi:10.1093/oncolo/oyae316
35. Me S, J C-C, A V, J H, D F-J, K S. Fatigue and quality of life in breast cancer survivors: Temporal courses and long-term pattern. *Journal of cancer survivorship : research and practice*. 2012;6. doi:10.1007/s11764-011-0197-3
36. Je B, Pa G, Ka D, C B, Jh R, Be M, et al. Fatigue in long-term breast carcinoma survivors: A longitudinal investigation. *Cancer*. 2006;106. doi:10.1002/cncr.21671
37. C VO, Ba C, K L, L D, Be A, C W, et al. Identification of distinct subgroups of breast cancer patients based on self-reported changes in sleep disturbance. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2012;20. doi:10.1007/s00520-012-1381-3
38. K D, Jj M, I S, A D, Q L, Sx X, et al. Prevalence and risk factors for insomnia among breast cancer patients on aromatase inhibitors. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2013;21. doi:10.1007/s00520-012-1490-z
39. Matthews H, Grunfeld EA, Turner A. The efficacy of interventions to improve psychosocial outcomes following surgical treatment for breast cancer: A systematic review and meta-analysis. *Psychooncology*. 2017;26: 593–607. doi:10.1002/pon.4199
40. Bootzin RR. Stimulus control treatment for insomnia: (465522008-198). 1973. doi:10.1037/e465522008-198
41. Ballesio A, Aquino MRJV, Feige B, Johann AF, Kyle SD, Spiegelhalder K, et al. The effectiveness of behavioural and cognitive behavioural therapies for insomnia on depressive and fatigue symptoms: A systematic review and network meta-analysis. *Sleep Medicine Reviews*. 2018;37: 114–129. doi:https://doi.org/10.1016/j.smrv.2017.01.006
42. Sa M, Aj H, Jc C, Rm D, P P, Cb R, et al. Putting evidence into practice: An update of evidence-based interventions for cancer-related fatigue during and following treatment. *Clinical journal of oncology nursing*. 2014;18 Suppl. doi:10.1188/14.CJON.S3.38-58
43. M de V, F S. Psycho-oncological interventions and psychotherapy in the oncology setting. *Recent results in cancer research Fortschritte der Krebsforschung Progres dans les recherches sur le cancer*. 2014;197. doi:10.1007/978-3-642-40187-9_9
44. R G, E G-B, C A, E R, S G. Stress reduction strategies in breast cancer: Review of pharmacologic and non-pharmacologic based strategies. *Seminars in immunopathology*. 2020;42. doi:10.1007/s00281-020-00815-y
45. Ba K, Sj S. Who benefits from psychosocial support interventions in humanitarian settings? *The Lancet Global health*. 2018;6. doi:10.1016/S2214-109X(18)30102-5
46. Toija A, Kettunen T, Kasila K. The construction of peer support among recently diagnosed breast cancer patients. *Cancer Nursing*. 2024; 10.1097/NCC.0000000000001319. doi:10.1097/NCC.0000000000001319
47. Lm G, Mh A, Jm S, Sc L, Dr J, Lc B, et al. Brief cognitive-behavioral and relaxation training interventions for breast cancer: A randomized controlled trial. *Journal of consulting and clinical psychology*. 2015;83. doi:10.1037/ccp0000020

48. A G, R C, M K. Cognitive-behavioural stress management enhances adjustment in women with breast cancer. *British journal of health psychology*. 2013;18. doi:10.1111/bjhp.12009
49. Jm S, Le B, Sc L, Bb B, Lm G, Dr J, et al. Long-term psychological benefits of cognitive-behavioral stress management for women with breast cancer: 11-year follow-up of a randomized controlled trial. *Cancer*. 2015;121. doi:10.1002/cncr.29076
50. D H, Tk O, S K-O, J D, S G, C S, et al. A pan-canadian practice guideline: Prevention, screening, assessment, and treatment of sleep disturbances in adults with cancer. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2013;21. doi:10.1007/s00520-013-1823-6
51. Mh A, S L, A D, S V, H H, K P, et al. Cognitive behavioral stress management effects on psychosocial and physiological adaptation in women undergoing treatment for breast cancer. *Brain, behavior, and immunity*. 2009;23. doi:10.1016/j.bbi.2008.09.005
52. D F, T M, L D, J N, C M, M E, et al. Effectiveness of nurse-led group CBT for hot flushes and night sweats in women with breast cancer: Results of the MENOS4 randomised controlled trial. *Psycho-oncology*. 2020;29. doi:10.1002/pon.5432
53. F J, Er D, C B, S S, H R. The effect of a group cognitive behavioral therapy on the quality of life and emotional disturbance of women with breast cancer. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2022;30. doi:10.1007/s00520-021-06421-4
54. Sun H, Huang H, Ji S, Chen X, Xu Y, Zhu F, et al. The efficacy of cognitive behavioral therapy to treat depression and anxiety and improve quality of life among early-stage breast cancer patients. *Integr Cancer Ther*. 2019;18: 1534735419829573. doi:10.1177/1534735419829573
55. M S, Z Z, A B. Efficacy of mindfulness-based cognitive therapy and cognitive behavioral therapy for anxiety, depression, and fatigue in cancer patients: A randomized clinical trial. *Iranian journal of psychiatry*. 2021;16. doi:10.18502/ijps.v16i3.6252
56. Gao Y, Liu M, Yao L, Yang Z, Chen Y, Niu M, et al. Cognitive behavior therapy for insomnia in cancer patients: A systematic review and network meta-analysis. *Journal of Evidence-Based Medicine*. 2022;15: 216–229. doi:10.1111/jebm.12485
57. Koch L, Jansen L, Brenner H, Arndt V. Fear of recurrence and disease progression in long-term (≥ 5 years) cancer survivors—a systematic review of quantitative studies. *Psycho-Oncology*. 2013;22: 1–11. doi:10.1002/pon.3022
58. J S, H I. The evolution of fear of cancer recurrence during the cancer care trajectory and its relationship with cancer characteristics. *Journal of psychosomatic research*. 2013;74. doi:10.1016/j.jpsychores.2012.12.013
59. B T, P B, Ml B, J B, R S-H, M G, et al. Fear of cancer recurrence in young women with a history of early-stage breast cancer: A cross-sectional study of prevalence and association with health behaviours. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer*. 2012;20. doi:10.1007/s00520-011-1371-x
60. G H, G O. The AFTER intervention: A structured psychological approach to reduce fears of recurrence in patients with head and neck cancer. *British journal of health psychology*. 2008;13. doi:10.1348/135910708X283751
61. A' S, B T, J T, J G, J F, L S, et al. Pilot of a theoretically grounded psychologist-delivered intervention for fear of cancer recurrence (conquer fear). *Psycho-oncology*. 2015;24. doi:10.1002/pon.3775
62. S S, J S. Screening and comorbidity of clinical levels of fear of cancer recurrence. *Journal of cancer survivorship : research and practice*. 2015;9. doi:10.1007/s11764-015-0424-4
63. Oxlad M, Wade T d., Hallsworth L, Koczwara B. 'I'm living with a chronic illness, not . . . dying with cancer': A qualitative study of Australian women's self-identified concerns and needs following primary treatment for breast cancer. *European Journal of Cancer Care*. 2008;17: 157–166. doi:10.1111/j.1365-2354.2007.00828.x
64. M van de W, B T, M G, A S, J P. Efficacy of blended cognitive behavior therapy for high fear of recurrence in breast, prostate, and colorectal cancer survivors: The SWORD study, a randomized controlled trial. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2017;35. doi:10.1200/JCO.2016.70.5301
65. R B, B T, L R, W K, A S, M van de W, et al. Long-term efficacy and cost-effectiveness of blended cognitive behavior therapy for high fear of recurrence in breast, prostate and colorectal cancer survivors: Follow-up of the SWORD randomized controlled trial. *BMC cancer*. 2019;19. doi:10.1186/s12885-019-5615-3
66. E S, Ea G. Mind-body interventions for vasomotor symptoms in healthy menopausal women and breast cancer survivors. A systematic review. *Journal of psychosomatic obstetrics and gynaecology*. 2017;38. doi:10.1080/0167482X.2016.1235147
67. Pn B, J T, J G, L S, Ab S, Je F, et al. Randomized trial of ConquerFear: A novel, theoretically based psychosocial intervention for fear of cancer recurrence. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2017;35. doi:10.1200/JCO.2017.73.1257

68. S M-B, F M-R, Me A, M M-J. Effectiveness of group training based on acceptance and commitment therapy on anxiety and depression of women with breast cancer. *Iranian journal of cancer prevention*. 2015;8. Available: <https://pubmed.ncbi.nlm.nih.gov/25960844/>
69. Le C, R T, J S, E D, L Z, M S. Randomized-controlled trial of mindfulness-based cancer recovery versus supportive expressive group therapy among distressed breast cancer survivors (MINDSET): Long-term follow-up results. *Psycho-oncology*. 2016;25. doi:10.1002/pon.4150
70. Cj H, Sj E, Jb H, Pg N, Je H, Pw T. Effectiveness of mindfulness-based stress reduction in mood, breast- and endocrine-related quality of life, and well-being in stage 0 to III breast cancer: A randomized, controlled trial. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2012;30. doi:10.1200/JCO.2010.34.0331
71. Sg H, P G, De H. Loving-kindness and compassion meditation: Potential for psychological interventions. *Clinical psychology review*. 2011;31. doi:10.1016/j.cpr.2011.07.003
72. Nm T, Ms O, A D, J G, G H, S L, et al. Effect of psychological intervention on fear of cancer recurrence: A systematic review and meta-analysis. *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*. 2019;37. doi:10.1200/JCO.19.00572