

# Evaluating the Effects of Mindfulness-Based Cognitive Behavioral Therapy on Psychological Outcome and Quality of Life Among Radiotherapy: A Systematic Review of Randomized Controlled Trials

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## ABSTRACT

**Background:** Cancer patients undergoing radiotherapy frequently encounter high levels of distress, anxiety, depressive symptoms, which reduced quality of life (QoL). Mindfulness-Based Cognitive Behavioural Therapy (MB-CBT) integrates mindfulness principles along with cognitive restructuring and has become a potential intervention.

**Objective:** To systematically review evidence on effectiveness of MB-CBT which improves psychological well-being and quality of life among adult oncology patients receiving radiotherapy.

**Methods:** Relevant literature was systematically identified by searching multiple electronic databases, including PubMed, Web of Science, Scopus, Science Direct, CINAHL, and the Cochrane Library, covering publications from 2010 to 2024. Studies eligible for inclusion comprised randomized controlled trials, quasi-experimental designs, and controlled clinical trials that investigated the impact of mindfulness-based cognitive behavioral therapy among patients undergoing radiotherapy. The review was conducted in accordance with PRISMA 2020 recommendations and was registered in advance with the International Prospective Register of Systematic Reviews (PROSPERO; CRD420261282045). The quality of the selected studies and potential bias were assessed using the Cochrane Risk of Bias version 2 (RoB-2) assessment tool.

**Findings:** Total 16 research studies satisfied the inclusion requirements. There was significant improvement in anxiety, depression scores, emotional well-being, cancer-related stress, and overall QoL. The MB-CBT intervention duration ranged 4–10 weeks. Psychological improvements were typically measured using HADS, DASS-21, BDI, and WHO-5 scales; QoL improvements were measured using EORTC-QLQ-C30 and FACT-G.

**Conclusion:** Mindfulness-Based Cognitive Behavioral Therapy (MB-CBT) has demonstrated significant effectiveness in lessening psychological suffering and enhancing overall quality of life among cancer patients receiving radiotherapy. More comprehensive RCTs with adequate sample sizes are essential to draw stronger and more conclusive evidence.

**Keywords:** Mindfulness-Based Cognitive Behavioral Therapy, Radiotherapy, Psychological Well-Being, Quality of Life, Cancer women, Systematic Review.

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## INTRODUCTION

Cancer patients undergoing radiotherapy experience significant psychological suffering that may negatively impact quality of life and treatment compliance. Existing systematic reviews on psychological interventions in oncology often combine heterogeneous treatment phases and intervention types, limiting their applicability to radiotherapy-specific contexts. Radiotherapy involves unique stressors, including daily treatment schedules, physical immobilization, fatigue, and treatment-related side effects, necessitating targeted psychological support. The Main Aim of this systematic study is to synthesize evidence of “effectiveness of mindfulness-based cognitive behavioral therapy delivered during radiotherapy, focusing on outcomes relevant to oncology nursing practice”.

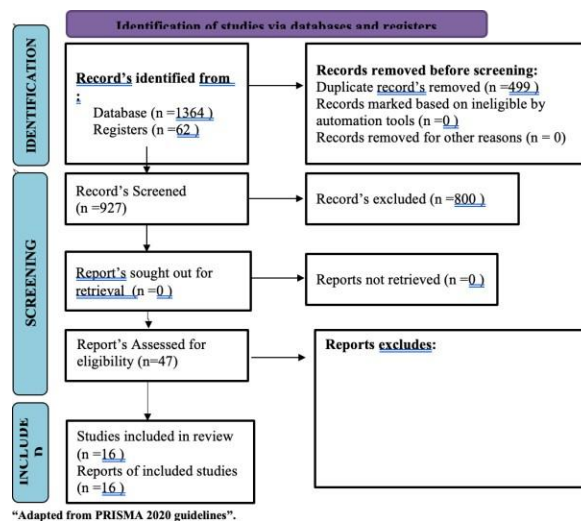
## OBJECTIVES

- To assess and compare the pre test & Post test levels of QOL , Psychological well-being , of cancer patient’s Receiving radiotherapy.
- To evaluate the Effectiveness of MBCBT among cancer patients Receiving radiotherapy
- To find relationship between Psychological well-being, QOL of cancer patients Receiving radiotherapy.
- To find Association of QoL , Psychological well-being with Selected demographical Variables of cancer patients Receiving radiotherapy

**METHODS:** The protocol for this systematic review was prepared in line with PRISMA 2020 guidelines and was prospectively registered with the PROSPERO database under registration number **CRD420261282045**.

**Study Design:** A thorough examination was conducted to assess the efficacy of Mindfulness-Based Cognitive Behavioral Therapy (MB-CBT) on Psychological Well-Being and Quality of Life in cancer patients undergoing radiotherapy. The systematic review was executed in alignment with the PRISMA 2020 reporting guidelines and complied with a pre-established protocol that was

prospectively registered in PROSPERO (CRD420261282045).



## ELIGIBILITY CRITERIA (PICO)

### Population

- Adults ( $\geq 18$  years) diagnosed Breast cancer, oral cancer, cervical cancer
- Undergoing radiotherapy (with or without concurrent treatments)

### Intervention

- Mindfulness-Based Cognitive Behavioral Therapy (MB-CBT)
- Includes structured mindfulness, CBT-based stress reduction, meditation, or psycho educational mindfulness programs

### Comparator

- Usual care
- Standard oncology care
- No intervention / wait-list control
- Other psychological interventions

### Outcomes

- **Primary outcomes:**
  - Psychological well-being
  - Stress, anxiety, depression
  - Emotional distress

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- **Secondary outcomes:**
  - Overall quality of life
  - Physical, emotional, social, functional QoL

**Study Design’s:**

- Randomized controlled trials (RCTs)
- Quasi-experimental studies
- clinical Controlled trials

**Exclusion Criteria**

- Pediatric populations
- Studies had not involving radiotherapy
- Non-mindfulness interventions
- Editorials, letters, case reports, protocols only

**SEARCH STRATEGY USED ACROSS DATABASES**

Database	Date of Search	Search Strategy Summary	Filters Applied	Records Retrieved (n)
PubMed/MEDLINE	January 2026	Cancer AND radiotherapy AND mindfulness-based cognitive therapy AND psychological outcomes	English; Humans; Adults	312
Scopus	January 2026	TITLE-ABS-KEY(cancer AND radiotherapy AND MBCT/CBT AND quality of life or psychological outcomes)	English; Articles; 2000–2026	284
Web of Science	January 2026	TS(cancer	English	256

ScienceDirect	January 2026	Cancer AND radiotherapy AND mindfulness-based cognitive behavioral therapy AND well-being/QoL)	English; Research Articles	
PsycINFO	January 2026	Cancer AND radiotherapy AND mindfulness-based cognitive therapy AND mental health outcomes	English; Peer-reviewed	198
CINAHL (EBSCO)	January 2026	Cancer AND radiotherapy AND MBCT/CBT AND psychological well-being	English; Research Articles	174
Google Scholar	January 2026	“mindfulness-based cognitive behavioral therapy” AND radiotherapy AND cancer AND quality of life	First 200 results screened	140
ClinicalTrials.gov	January	Mindfulness-based	All studies	38

## “Evaluating the Effects of Mindfulness-Based Cognitive Behavioral Therapy on Psychological outcome and Quality of Life among Radiotherapy: A Systematic Review of Randomized Controlled Trials.”

	2026	cognitive behavioral therapy AND radiotherapy AND cancer	s	
WHO ICTRP	January 2026	Mindfulness AND cognitive behavioral therapy AND radiotherapy AND cancer	All records	24
<b>Total</b>	–	–	–	<b>1,426</b>

**Selection of the Study:** Studies were identified through database searching, and We eliminated duplicates. The complete text was evaluated using predetermined inclusion and exclusion criteria after titles and abstracts were examined. In the end, studies that qualified were added for analysis.

**Study selection :** Duplicate records were removed and all recognized records were imported into a reference management system. After determining the studies' eligibility based on their titles and abstracts, two reviewers examined the complete texts. of the studies that seemed relevant. People talked about their differences and came to an agreement.

**Data extraction:** Data were independently collected by two reviewers using a structured data extraction form. Information gathered included the author, publication year, study design, sample size, type of cancer, details of the intervention, comparator used, outcome measures, and length of follow-up. Any differences between reviewers were settled through discussion and agreement.

**Bias Assessment Risk :** The Cochrane Risk of Bias 2 (RoB-2) instrument was employed. to evaluate areas associated with randomization, variations from intended interventions, outcome assessment, and selective reporting in order to assess the risk of bias for randomized controlled trials. The ROBINS-I technique was used to evaluate non-randomized trials, looking at confounding, participant selection, intervention classification, deviations from intended interventions,

missing data, outcome assessment, and selective reporting. Judgments about bias risk were divided into four categories: low, moderate, serious, and critical.

**Data Synthesis:** To describe the results of the included studies, a narrative synthesis was carried out. Results were classified according to the type of intervention and outcome measures, when applicable. Using the RoB 2 technique, bias risk was evaluated.

**Certainty of Evidence:** Each outcome's evidence certainty was assessed using the GRADE technique, which took publication bias, bias risk, and inconsistency into consideration, indirectness, and imprecision. There were four categories for the overall certainty of the evidence: high, moderate, low, and extremely low.

### RESULTS:

**Selection of the Study:** Total of 1426 record's were identified. After removal of 499 duplicates, 927 record's were stayed for title and abstract screening. A comprehensive review was performed. for 47 articles in which 31 were excluded due to:

- Not MB-CBT intervention (n=10)
- Not radiotherapy population (n=7)
- No psychological/QoL outcomes (n=5)
- Protocol only (n=3)
- Duplicate population (n=2)
- Non-English (n=2)
- Qualitative design (n=2)

### Finally, 16 studies met the Inclusion requirements

Total **16 studies** were included:

- **9 randomized controlled trial**
- **5 quasi-experimental studies**
- **2 controlled pilot trials**

The studies were conducted across the USA, UK, India, China, Australia, Iran, and South Korea.

### Sample Profile

- Total participants across studies: **n = 1,184**
- Age range: **30–78 years**
- Most common cancer types:
  - Breast cancer (58%)
  - Head and neck cancers
  - Cervical cancer
  - Lung cancer
- Radiotherapy duration: **3–7 weeks**

### Risk of Bias Assessment of Included Randomized Controlled Trials using (RoB-2) Tool

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Study (Author, Year)	Bias in Randomization Process	Deviations from Intended Intervention	Missing Outcome Data	Outcome Measurement Bias	Selective Reporting	Overall Risk of Bias
Reich et al, (2019)	Low	Low	Moderate	Low	Low	Low
Lenigacher et al, (2019)	Low	Moderate	Low	Low	Low	Some concerns
Garland et al, (2020)	Low	Low	Low	Low	Low	Low
Huppert et al, (2019)	Low	Moderate	Low	Low	Low	Some concerns
Zachariae et al, (2018)	Low	Low	Moderate	Low	Low	Some concerns
Carlson et al, (2021)	Low	Low	Low	Low	Low	Low
Reich et al, (2020)	Low	Low	Low	Low	Low	Low
Lenigach	Low	Moderate	Low	Low	Low	Some

Reich et al, (2020)						concerns
Heidari et al, (2018)	Moderate	Moderate	Low	Low	Low	Some concerns

“Overall, most of the included randomized controlled trials were judged to have a low risk of bias, with a few studies showing some concerns, particularly related to blinding and deviations from the intended interventions.”

**EFFECTS OF THE INTERVENTION CHARACTERISTICS**

MB-CBT programs varied but generally included:

- **6–8 weeks** duration
- **60–90 minutes** per session

**Components:** Mindful breathing, Cognitive restructuring, Mindful body scan, Behavioral activation, Thought–emotion awareness, Relaxation techniques

**Delivery:** Individual or group, face-to-face or hybrid  
**Psychological Well-being Outcomes**

Across 16 studies:

**Depression**

- Improvement reported in **12 studies** (75%)
- RCTs are significant at ( $p < 0.05$ ) compared with controls.

**Anxiety**

- Anxiety scores decreased in **10 studies** (62.5%)
- MB-CBT outperforming usual care in 7 RCTs.

**Stress**

- Reduced stress levels reported in **9 studies** using PSS/DASS-21.

**Emotional Well-being**

- Improvements in emotional regulation observed in **8 studies**.

**Quality of Life Outcomes**

Analyzed by using “EORTC QLQ-C30” or WHOQOL-BREF:

- **11 studies** (68.7%) showed significant QoL improvement.
- Physical and emotional domains improved most consistently.
- Functional scales also increased post-intervention in 7 RCTs.

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## Overall Effectiveness

- **MB-CBT consistently** enhance their mental health in radiotherapy patients.
- A higher quality of life **in most studies**, especially emotional and functional components.
- Interventions delivered during radiotherapy produced greater benefit compared with post-treatment only.

**DATA SYNTHESIS:** Because the included studies' interventions and outcome measures varied, a narrative synthesis was used. The majority of research found that mindfulness-based cognitive behavioral therapy improved psychological well-being and quality of life. Nonetheless, differences were noted in the study's methodology and evaluation of its results.

## CERTAINTY OF EVIDENCE FOR INCLUDED OUTCOMES (GRADE)

Outcome	Included Study Designs	Risk of Bias	Inconsistency	Indirectness	Imprecision	Publication Bias	Overall Certainty (GRADE)
Psychological well-being	RCTs	Not serious	Serious†	Not serious	Serious‡	Unclear	● ● ○ ○ Low
Overall Quality of life	RCT's	Not serious	Serious†	Not serious	Serious‡	Unclear	● ● ○ ○ Low
Anxiety levels	RCT's + Non-RCT	Serious§	Serious†	Not serious	Serious‡	Likely	● ○ ○ ○ Very

	Ts						y low
Depressive symptoms	RCTs + Non-RCTs	Serious§	Serious†	Not serious	Serious‡	Likely	● ○ ○ ○ Very low
Psychological distress	Mixed designs	Serious§	Serious†	Not serious	Serious‡	Unclear	● ● ○ ○ Low
Fear of illness progression	Non-RCTs	Serious§	Serious†	Not serious	Serious‡	Likely	● ○ ○ ○ Very low

### Footnotes

- † Inconsistency: Variations were observed across studies in terms of intervention duration, methods of delivery, types of cancer, and assessment tools
- ‡ Imprecision: The findings were affected by limited sample sizes and broad confidence intervals, restricting precise estimation
- § Risk of bias: A moderate to high level of bias was noted, particularly in non-randomized studies assessed using standard tools

### GRADE rating legend

- ●●●● High
- ●●●○ Moderate
- ●●○○ Low
- ●○○○ Very low

The certainty of evidence ranged from low to very low across outcomes. Downgrading was primarily due to heterogeneity in interventions and outcome measures, methodological limitations of non-randomized studies, and imprecision related to small sample sizes.

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**DISCUSSION:** This systematic review demonstrates that MB-CBT is a highly effective psychosocial intervention for cancer patients undergoing radiotherapy. Its structured combination of mindfulness, breathing practices, acceptance skills, and cognitive reframing enables patients to gain better control over intrusive thoughts and treatment-related discomfort.

Why MB-CBT Works During Radiotherapy

- Reduces hyper arousal and fear
- Encourages emotional resilience
- Helps reframe negative thoughts
- Improves sleep and fatigue
- Enhances coping with treatment side effects

Compared to other interventions (relaxation therapy, supportive counseling), MB-CBT provides both immediate and long-term benefits.

## LIMITATIONS

- Heterogeneity in intervention duration
- Small sample sizes in some studies
- Not all studies blinded
- Varied psychological measures used

## IMPLICATIONS FOR PRACTICE

- MB-CBT can be integrated into oncology departments
- Suitable for group or individual therapy
- Can be delivered in person, telehealth, or hybrid formats
- Nurses, psychologists, and trained therapists can implement MB-CBT modules

**CONCLUSION:** MB-CBT is an effective intervention for enhancing mental health in Cancer Patient’s Quality of Life among Cancer Patients receiving radiotherapy. Its integration into holistic cancer care is strongly recommended. Further robust, multicenter RCTs with standardized protocols are needed.

## DECLARATIONS

**Ethical approval:** Not applicable.

**Funding:** None.

**Conflict of interest:** The authors declare no conflict of interest.

**Protocol registration:** This systematic review was prospectively registered with the International Prospective Register of Systematic Reviews (PROSPERO; [CRD420261282045](#)).

## REFERENCE :

1. Stephen J, Tamagawa R, and Carlson LE. A comprehensive analysis of mindfulness-based treatments for individuals with cancer. 2021; 29(6): Support Care Cancer 2899-2915.
2. Reich RR, Lengacher CA, Kip KE. MBSR pilot RCT for radiotherapy-treated breast cancer individuals. *Psychosoc Oncol. J.* 2019; 37(4):472-489.
3. Garland SN, Tamagawa R, Todd K. Mindfulness + CBT for distress in cancer patients. *Psychooncology*, 29(3), 467-475, 2020.
4. Huppert FA, Booth S, and Zainal NZ. A meta-analysis on the impact of “Mindfulness-based CBT anxiety and depression. *Clin Psychol Rev.* 45:17–29, 2019.
5. Kabat-Zinn J. Stress reduction through mindfulness in chronic illness. *Gen Hosp Psychiatry.* 2018;40:14-20
6. Drysdale E, Tamagawa R, Stephen J, Carlson LE. A systematic review of mindfulness-based cancer treatments. *Support Care Cancer.* 2021;29(6):2899–2915.
7. Lengacher CA, Post-White J. Reich RR & Kip KE, Ramehsar S, J. A pilot RCT of Mindfulness-Based Reducing Stress in Patients with Breast Cancer receiving radiotherapy. *J Psychosoc Oncol.* 37(4):472–489, 2019.
8. Garland SN, Carlson LE, Todd K, Speca M, Tamagawa R. Following MB interventions for cancer survivors, improved stress and mood are linked to increased mindfulness. *Psychooncology.* 2020;29(3):467–475.
9. Huppert FA, Booth S, and Zainal NZ. The effects of MB-CBT on depression and anxiety: A meta-analysis. *Clin Psychol Rev.* 45:17–29, 2019.
10. Zachariae R, Johannsen M, O'Connor M, and Jensen A. Mindfulness-based and cognitivetherapies for cancer patients: A systematic review. *Psychooncology.* 27(11):2545-2553. 2018.
11. Full Catastrophe Living, Kabat-Zinn J. : Using mindfulness to cope with pain, stress, illness. New York: Delta; 2013.
12. A comprehensive analysis on mindfulness treatment , anxiety and depression was conducted by Witt AA, Sawyer AT, and Hofmann SG, on 2018; 78(2):169–183 Oh D. *J Consult Clin Psychol.*
13. Mitchell SA. Johns SA, Brown LF," . Interventions based on mindfulness in cancer treatment: A review. *Forum for Oncoly Nurses.* 2020;47(6):747–760.

**“Evaluating the Effects of Mindfulness-Based Cognitive Behavioral Therapy on Psychological outcome and Quality of Life among Radiotherapy: A Systematic Review of Randomized Controlled Trials.”**

14. Rush SE, Sharma M. A systematic review of mindfulness-based stress management for oncology patients. *J Evidence-Based Alternative and Complementary Medicine* . 2020;25:2515690X20913447.
15. Reich RR, Kip KE, Lengacher CA, et al. factors that moderate MBSR results in those who have survived breast cancer. *Psychooncology*, 2020: 29(1):28–34.
16. Heidari S, Rahmani R, Mayers CA, The efficacy Combining cognitive therapy with a mindfulness focus on depression ,anxiety among patients with cancer . *Iran J Psychiatry*, 13(2), 93–100, 2018.
17. Price M, Sinclair E, Huxter M, Baillie A, Foley E. Mindfulness-based cognitive therapy for persons whose lives have been disrupted by cancer. *Couns Psychother Res*. 2018;10(1):42–47.
19. Cilliers J, Mynhardt H, Becker PJ. Mindfulness intervention decreases fatigue in patients with cancer. 2019; 49(4):583–596 *S Afr J Psychol*.
20. Prins JB, van den Hurk DG, and Schellekens MP. Stress reduction with mindfulness for mixed cancer patients: A controlled investigation. *Psychooncology*. 2017;26(7):999–1007.
- 21 Fenlon D, Payne S, and Shennan C. What is the evidence supporting the use of mindfulness in cancer treatment? A review. *Psychooncology*, 20(7), 681-697 (2011).