

Table 1: Systematic reviews of mindfulness and sleep

Source: Mora DC, CAM-Cancer Collaboration. Systematic reviews of mindfulness and sleep [online document]. <https://cam-cancer.org/CAM-Summaries/>, June 2026.

Sleep			
Review characteristics	PICO of included studies	Results and conclusions	Assessment
Han J, Shi M, Bi L-N, Wang, L.-I, & Cai Y-x. (2023). <i>Efficacy of mind–body therapies for sleep disturbance in patients with early-stage cancer: A systematic review and network meta-analysis</i> . Psycho-Oncology, 32(9), 1315–1338. https://doi.org/10.1002/pon.6187.pdf (Han 2023a NMA)			
Type of review: Systematic review Includes studies, n and design 47 RCTs Search strategy: Databases CINAHL (via EBSCO Host), Cochrane Library, Embase, MEDLINE, PsycINFO, PubMed, and Scopus Dates From inception to October 2022 Data synthesis Network meta-analysis Risk of bias assessment Cochrane Risk of Bias tool RoB2	Participants 4,325 participants Adults (≥18 years) with early-stage cancer (during or after treatment) Interventions Mind-body techniques: - Mindfulness (19 RCTs) - Hypnosis (2 RCTs) - Relaxation techniques (5 RCTs) - Qigong (incl. tai chi) (5 RCTs) Control UC & WLC (30 RCTs), CBT, exercise, active control (11 RCTs), two control groups (6 RCTs). Outcome measures Primary: Subjective sleep disturbance PSQI, ISI, EORTC QLQ-C30 sleep items, PROMIS, other scales such as MSQ, VAS, GSDS, AIS, MOS-Sleep. Measure of treatment effect SMD 95% CI. Treatment ranking using SUCRA.	Results for risk of bias assessment of primary studies included in the review Overall 19 high-risk studies, 15 with “some concerns”. The majority of studies showed low risk of bias in the randomization process, outcome measurement, and missing outcome data. About half of the studies had some concerns with selection, reported results, and deviations from intended interventions. GRADE: Overall, the certainty of evidence ranged from very low to moderate, with most comparisons rated as low or very low due to limitations such as study bias. Moderate-quality evidence was mainly found for comparisons involving mindfulness, yoga, and hypnosis versus usual care. Results for outcome measures: Subjective sleep disturbance (receiving active treatment) Mindfulness demonstrated the largest effect size: Mindfulness vs UC/WL: SMD = 0.85, (0.20, 1.50), SUCRA 88.9%, GRADE moderate Subjective sleep disturbance (completed active treatment): Qigong demonstrated the largest effect size in reducing (GRADE: low), followed by hypnosis (GRADE: moderate), and mindfulness (GRADE: moderate). Mindfulness vs UC/WL: SMD = 0.42 (0.24, 0.59), SUCRA 49.4% (for comparison CBT vs UC/WL: SMD = 1.51 (0.94, 2.09), SUCRA 96.3%; Qigong vs UC/WL: SMD = 0.99(0.35, 1.63) SUCRA 70.0%; Hypnosis vs UC/WLSMD = 0.87 (0.32, 1.42), SUCRA 65.6%).	Quality assessment of the SR Moderate to high quality. Low-moderate risk according to ROB-MNA checklist. Appropriate network meta-analysis methods; no significant inconsistency detected, SUCRA ranking applied, certainty assessed with GRADE for NMA. Conclusions consistent with evidence: acknowledge low–moderate certainty, emphasize CBT remains superior. Comments Credibility of comparative effects limited despite appropriate methods. High heterogeneity (different cancers, interventions, durations), sparse networks for some comparisons (e.g., hypnosis, qigong), some key estimates based on very few studies or indirect evidence, evidence often low or very low certainty, limiting confidence in the findings. Many included RCTs had high or unclear risk of bias. Missing data and outcome measurement domains frequently problematic.

		Objective sleep outcomes (sleep efficiency) The effects of mindfulness were not as strong as those of other interventions. SUCRA ratings Qigong 93.8%; CBT 83.3%; active support 42.7%; mindfulness 42.2%. Adverse events The article did not assess the report of adverse events from the included studies. Conclusions “The certainty of the effectiveness of mindfulness for sleep disturbance (SD) in patients with cancer was moderate. Hypnosis and qigong had moderate and low certainties of being effective for SD in patients with cancer who had completed active treatment.”	
Han, J., Cheng, H.-L., Bi, L.-N., & Molasiotis, A. (2023). Mind-body therapies for sleep disturbance among patients with cancer: A systematic review and meta-analysis. Complementary Therapies in Medicine, 75, 102954. https://doi.org/10.1016/j.ctim.2023.102954 (Han 2023b)			
Type of review: Systematic review Included studies, n and design 68 RCTs; thereof 24 of mindfulness Search strategy: Databases MEDLINE, Embase, CINAHL (via EBSCOhost), Cochrane Library, Scopus, PubMed, PsycINFO Dates From inception to September 2022 Data synthesis Meta-analysis Risk of bias assessment Cochrane Risk of Bias tool RoB2	Studies and participants 6,339 participants (5,051 included) in meta-analysis) Adults ≥18 years with cancer, any type, at any stage receiving mind-body therapies. Interventions Mindfulness/meditation (24 RCTs), Yoga (20 RCTs) Qigong/Tai chi (11 RCTs) Relaxation (9 RCTs) Hypnosis (2 RCTs) Guided imagery (1 RCT) Mixed MBT (1 RCT) Control UC, WL, active control (education, exercise, etc) Outcome measures <u>Subjective sleep disturbance:</u> PSQI, ISI, PROMIS, EORTC-QLQ-C30, other sleep questionnaires <u>Objective sleep outcomes:</u> Actigraphy, polysomnography, sleep diary, and armband (Sleep disturbance, sleep quality,	Results for risk of bias assessment of primary studies included in the review Most studies demonstrated low risk of bias for randomization process, and measurement of the outcome.* The reporting of the selection of the reported result and deviations from intended interventions in most studies was unclear, leading to some concerns. For missing outcome data several studies were assessed as high risk of bias. GRADE: No assessment was conducted Results for outcome measures: Mindfulness Subjective sleep disturbance UC/WL <i>Immediate:</i> SMD = -0.74 (-1.10, -0.37), p = 0.001 <i>Mid-term:</i> SMD = -0.75 (-1.13, -0.38), p = 0.001 <i>Long-term:</i> SMD = -0.94 (-1.54, -0.34), p = 0.001 Mindfulness Sleep onset latency UC/WL Immediate SMD = -5.21 (-8.70, -1.73), p = 0.001 Mindfulness Total sleep time UC/WL <i>Immediate:</i> SMD = 13.94 (3.47, 24.41), p = 0.01	Quality assessment of the SR: Low-moderate quality according to AMSTAR 2 checklist. Lacks adequate integration of risk of bias in the interpretation of results and conclusion. Authors acknowledge “unclear methodological weaknesses” but conclusions remain relatively strong despite high heterogeneity and many trials with unclear/high risk. * Overly optimistic judgments (major issue). Bias is likely underestimated. All studies rated low risk for outcome measurement, despite heavy reliance on self-reported sleep outcomes (PSQI etc.). In RoB 2 self-reported outcomes in unblinded trials are rated as high risk or at least some concerns. Comments No assessment of adverse events. No GRADE assessment of evidence certainty. The included studies had high heterogeneity in interventions, populations, and outcome measures.

	insomnia, sleep efficiency (SE), sleep onset latency (SOL), total sleep time (TST), wake after sleep onset (WASO)) Measure of treatment effect SMD, WMD, 95% CI.	No significant effects of mindfulness interventions on subjective sleep disturbance when compared with active control interventions. No significant effects on sleep efficiency or wake after sleep onset, despite some objective improvements in other parameters. Adverse events: The article did not assess the report of adverse events from the included studies. Conclusions <i>“Among mind-body therapies, mindfulness, yoga, relaxation, and hypnosis were effective in reducing the severity of subjective sleep disturbance among patients with cancer at post-intervention, and the effect of mindfulness lasted at least 6 months. MBTs were not superior to active control interventions in improving sleep. However, there were high heterogeneity, many pilot studies, and insufficient data in some sub-analyses in this review, further RCTs with rigorous study designs are needed to verify our recommendations.”</i>	Most evidence is rated low or very low certainty, limiting confidence in the findings Most studies reported a high risk of bias, mainly due to missing data and reporting. Several of the included studies had a small sample size and were pilot studies.
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Systematic reviews excluded from the evidence summary due to low quality

Reangsing, C., Punsuwun, S., & Oerther, S. (2025). [Effects of mindfulness-based interventions \(MBIs\) on quality of sleep among patients with cancer: A systematic review and meta-analysis of randomized controlled trials](https://doi.org/10.1016/j.jpsychores.2025.112110.pdf). Journal of Psychosomatic Research, 192, 112110. <https://doi.org/10.1016/j.jpsychores.2025.112110.pdf>

Type of review: Systematic review Studies, n and design 25 RCTs. Search strategy: Databases Ovid Medline, CINAHL, PubMed, Scopus, APA PsycINFO, AgeLine, Web of Science, Academic Search Complete, ScienceDirect, ProQuest Dissertations & Theses Dates From inception to October 2024 Data synthesis Meta-analysis Risk of bias assessment Cochrane Risk of Bias tool RoB2. “Quality indicators” including fidelity, power.	Participants 2,263 participants Patients with cancer (any type, stage, or treatment phase) Interventions MBSR, MBCT, MBAT, compassion-based and other adapted mindfulness approaches Control UC, WLC Outcome measures Quantitative measures of sleep disturbance or quality of sleep (e.g., PSQI, MOS Sleep Scale) Measure of treatment effect SMD 95% CI	Results for risk of bias assessment of primary studies included in the review Most studies showed some concern about deviations from the intended intervention. The risk of bias assessment indicated that all studies were at low risk of bias due to the randomization process, missing outcome data, measurement of the outcome, and selection of the reported result. * GRADE: No assessment was conducted Results for outcome measures Overall effect (MBI vs. Control) Moderate, significant improvement in sleep quality among patients receiving mind-based interventions compared with controls. SMD = 0.598 (0.332, 0.864), $p < 0.001$ Subgroup analysis MBI improved sleep quality across all subgroups, but the magnitude of effect varied. Larger effects were observed in unfunded studies, immediately post-intervention, and in intervention types, especially MBSR. Adverse events The authors stated that none of the primary studies reported adverse effects associated with mindfulness-based interventions. Conclusions “In this systematic review and meta-analysis of twenty-five primary studies, we found that MBIs had a positive impact on improving quality of sleep in patients with cancer.”	Quality assessment of the SR Low according to AMSTAR 2 checklist. RoB not transparently reported, judgements are overly optimistic, no detailed justification per study. Impact of RoB on results only partly assessed and integrated into interpretation of pooled effect. Comments Conclusions remain overly confident despite high statistical heterogeneity and evidence of publication bias, RoB findings not meaningfully downgraded in conclusions *Outcome measurement bias was underestimated, as subjective self-reported sleep outcomes in unblinded MBI trials with no-treatment controls should be considered at high risk of bias. This affects interpretation of findings in the light of RoB. Authors created additional “quality indicators” and treated them as moderators, which is not transparent. Comments: The SR is of low quality, and there is substantial heterogeneity and potential bias present. No GRADE assessment of evidence certainty was conducted.
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Yang B, Nie Q, & Yang,Y. (2021). [The effects of mindfulness-based intervention on sleep disturbance and benzodiazepine hypnotics use in patients hospitalized with cancer: A systematic review and meta-analysis](https://doi.org/10.1016/j.jpsychores.2021.110483.pdf). Journal of Psychosomatic Research, 146, 110483. <https://doi.org/10.1016/j.jpsychores.2021.110483.pdf>

Type of review: Systematic review Studies: n and design 14 RCTs Search strategy Databases MEDLINE, EMBASE, CINAHL, PsycINFO, Web of Science, Cochrane Central Register of Controlled Trials, WHO ICTRP, and ClinicalTrials.gov Dates From inception to January 2020 Data synthesis Meta-analysis Risk of bias assessment Cochrane Risk of Bias tool RoB	Participants 1,659 participants Adults (≥18 years) with cancer, experiencing sleep disturbance, undergoing active treatment (any cancer type, stage, or treatment) Interventions Mindfulness-based interventions, including: - MBSR: 4 RCTs - Mindfulness yoga: 5 RCTs - Other MBI programs: 5 RCTs Control - UC: 7 RCTs - WL: 3 RCTs - Active control: 1 RCT - Social support group: 1 RCT - Breathing control: 1 RCT Outcome measures Sleep disturbance: PSQI, 8-item Sleep Disturbance Scale, Sleep diary + Insomnia Severity Index, Medical Outcome Study Sleep Scale, Medication use Benzodiazepine/sleep medication. Measure of treatment effect SMD, WMD, 95% CI. Treatment ranking via SUCRA	Results for risk of bias assessment of primary studies included in the review Overall, six studies were evaluated as low risk of bias, four as moderate, and four as high. * Most studies demonstrated generally acceptable methodological quality, with several domains (random sequence generation, allocation concealment, and selective outcome reporting) rated as low risk. However, uncertainty and some high-risk ratings were noted, particularly in blinding procedures, incomplete outcome data, and other potential biases. GRADE: No assessment was conducted Results for outcome measures Significant improvements in sleep disturbance with MBI but not on sleep medication use. Sleep disturbance MBI vs control SMD = 0.37, (0.19, 0.55), $p < 0.001$ Sleep medication (BZD use): MBI vs control WMD = 0.24 (0.16, 0.32), p-value = 0.059 Subgroup analysis Subgroup analyses according to intervention types, MBSR showed stronger effects on sleep than yoga. Adverse events The article did not assess the report of adverse events from the included studies. Conclusions <i>"In conclusion, our analysis of these trials suggests that MBI is more effective in treating sleep disturbance over a short timeframe, relative to TAU and WLs, and may be associated with therapeutic benefits for BZDs use as well. Ultimately, we believe there is a need for high-quality, sufficiently powered RCTs to examine the effectiveness of MBI for reducing sleep medication use in patients with cancer."</i>	Quality assessment of the SR Low quality according to AMSTAR 2 checklist. No protocol registered. Problematic RoB application, oversimplified scoring system, likely underestimation of performance and detection bias (blinding). No meaningful integration of RoB into analysis, * Many studies rated low risk for blinding of outcome assessment, despite outcomes being self-reported sleep measures and participants not being blinded. Comments No GRADE assessment of evidence certainty. No assessment of adverse events. The included studies had high heterogeneity in interventions, populations, and outcome measures. Several of the included studies had a small sample size.
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Abbreviations

CBT: Cognitive behavioral therapy
CFS: Cancer Fatigue Scale
CI: confidence interval
CIS-FS: Checklist Individual Strength–Fatigue

CrF: Cancer-related fatigue
EORTC QLQ-C30– European Organization of Research and Treatment of Cancer Quality of Life Questionnaire
FACT-F: Functional Assessment of Cancer Therapy–Fatigue
FSI: Fatigue Symptom Inventory

FSS: Fatigue Severity Scale
 ISI: Insomnia severity index
 KISS: Korean Studies Information Service System MA: meta-analysis
 MAPs: Mindful Awareness Practices
 MBAT Mindfulness-Based Art Therapy
 MBCR: Mindfulness-Based Cancer Recovery
 MBCT: Mindfulness-Based Cognitive Therapy
 MBSR: Mindfulness-Based Stress Reduction
 MDASI M.D.: Anderson Symptom Inventory
 MFSI-SF: Multidimensional Fatigue Symptom Inventory–Short Form
 MOS-SS: Medical Outcomes Study Sleep Scale
 NDSL: National Digital Science Library (NDSL)
 PFS-R: Revised Piper Fatigue Scale
 POMS: Profile of Mood States
 PROMIS: Patient-Reported Outcomes Measurement Information System
 PSQI: Pittsburgh Sleep Quality Index
 RCT: randomized controlled trial
 RISS: Research Information Sharing Service
 RoB: Cochrane Risk of Bias Tool version 1
 SMD: standardized mean differences
 SUCRA: Surface Under the Cumulative Ranking Curve
 TAU: Treatment as usual
 UC: Usual care
 WLC: Waitlist control
 WMD: Weighted mean difference.

***AMSTAR 2 Critical Domain Items**

1. Was the review protocol established a priori (e.g., registered in PROSPERO)?
2. Was the search comprehensive and included multiple databases, grey literature, and appropriate search strategies?
3. [Did the authors provide a list of excluded studies and justify the exclusions?]
4. Was the risk of bias (RoB) of included studies assessed using appropriate tools?
5. If a meta-analysis was conducted, were the methods used appropriate and clearly described?
6. Did the authors consider the RoB in individual studies when discussing the results?
7. Was publication bias assessed and discussed appropriately?