Table 1: Systematic reviews of mindfulness for cancer


<table>
<thead>
<tr>
<th>Study year (ref)</th>
<th>Design and methods</th>
<th>Inclusion criteria</th>
<th>Included studies and participants</th>
<th>Included interventions and outcomes</th>
<th>Main results/Conclusions</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td><strong>Overviews of systematic reviews</strong></td>
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<td>Gotink, 2015 (31)</td>
<td>Type of review: Overview of SRs</td>
<td>Search strategy: PubMed, Embase, Psycinfo, Cochrane, Medline, Web of Science through January 12, 2015, restricted to systematic reviews and meta-analyses</td>
<td>Quality assessment: Checklist based on PRISMA</td>
<td>Measure of treatment effect: SMD</td>
<td>Data synthesis: meta-analysis of meta-analyses</td>
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<td></td>
<td>Studies: SRs of RCTs</td>
<td>Participants: Any</td>
<td>Interventions/comparator: MBSR or MBCT compared to any comparator</td>
<td>Outcomes: Any health outcome measure</td>
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<td></td>
<td>Studies: 23 SRs including 6 on cancer patients; 23 RCTs including 16 on cancer patients</td>
<td>Participants: 1,668 mixed cancer patients</td>
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<td></td>
<td>Intervention: MBSR/MBCT</td>
<td>Control: Active treatment, UC, WL</td>
<td>Concurrent treatment: Not reported</td>
<td>Outcome measures: Not reported</td>
<td>Results for outcome measures: Significant improvements for depression, anxiety, stress, quality of life, but not for physical health</td>
<td>Meta-analysis of meta-analyses not differentiated by patient groups; quality assessment tool not validated; quality assessment not reflected in conclusions</td>
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<td><strong>Systematic reviews</strong></td>
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<td>Study Authors</td>
<td>Type of review: SR and MA</td>
<td>Search strategy: PubMed between 2013 and 2017, published in English</td>
<td>Quality assessment: Cochrane RoB tool, PEDro score</td>
<td>Measure of treatment effect: SMD</td>
<td>Data synthesis: meta-analysis</td>
<td>Studies: RCTs and non-randomized studies published in English between 2013 and 2017 with a PEDro score &gt; 3</td>
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<td>Haller 2017 (33)</td>
<td>Type of review: SR and MA</td>
<td>Search strategy: PubMed (including MEDLINE), Scopus, Cochrane, through October 2016, Quality assessment: Cochrane RoB tool</td>
<td>Measure of treatment effect: SMD</td>
<td>Data synthesis: meta-analysis</td>
<td>Studies: RCTs</td>
<td>Participants: BC</td>
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</table>
| Huang, 2016 (34) | Type of review: SR and MA  
Search strategy: PubMed, EMBASE, Cochrane through June 30, 2014  
Quality assessment: Cochrane RoB tool, NOS  
Measure of treatment effect: MD  
Data synthesis: meta-analysis | Studies: RCTs and non-randomized studies  
Participants: BC  
Interventions/comparator: MBSR compared to UC or SC  
Outcomes: Quality of life, psychological function | Studies: 3 RCTs, 1 non-randomized CCTs, 4 uncontrolled trials  
Participants: 880 BC (728 in RCTs) | Intervention: MBSR  
Control: free choice of stress management techniques, nutrition education, UC  
Concurrent treatment: Active radiation and/or chemotherapy for a subset of patients in 1 RCT  
Outcome measures: BAI, BDI, CES-D, C-SOSI, FACT-B, MMOS, PSS, SCL-90 | Results for outcome measures: Short-term innergroup effects on depression, anxiety, and stress.  
Results quality assessment: Only 1 RCT had adequate randomization and blinding of outcome assessors  
Conclusions: Positive effect of MBSR in decreasing anxiety, depression and stress and improving overall quality of life among breast cancer survivors. This approach should be recommended to breast cancer patients.  
Search strategy incompletely reported; MD used although different outcome measures were used (MA biased); no between-group comparisons but only within-group comparisons in MA; safety not assessed. |
| Rush, 2017 (35) | Type of review: SR and MA  
Search strategy: Medline, Alt Health Watch, CINAHL between October 2009 and November 2015, restricted to adults and English language  
Quality assessment: None  
Measure of treatment effect: NA  
Data synthesis: qualitative | Studies: Any cancer  
Participants: Any cancer  
Interventions/comparator: MBSR compared to any comparator  
Outcomes: Stress, anxiety | Studies: 8 RCTs, 2 non-randomized CCTs, 3 uncontrolled trials  
Participants: 1,575 mixed cancer patients (1,143 in RCTs) | Intervention: MBSR  
Control: nutrition education, UC, WL  
Concurrent treatment: None (not reported for some studies)  
Outcome measures: BAI, BDI, blood pressure, CES-D, CSES, Cortisol, C-SOSI; FACT, FACT-Sp, FFMQ, HADS, heart rate IES, MAAS, MAC, MSCL, POMS, respiratory rate, RRQ, RSES, SCL-90, UCLA Loneliness Scale | Results for outcome measures: Not synthesized  
Results quality assessment: None  
Conclusions: MBSR is a promising modality for stress management among cancer patients. All practitioners must include MBSR as one of the approaches for stress reduction as part of cancer care.  
Studies not indexed in the searched databases were excluded; search strategy inadequate; no RoB assessment; results not synthesized but only listed in a table; safety not assessed; conclusions not based on evidence (too strong). |
| Schell, 2019 (36) | Type of review: Cochrane SR and MA  
Search strategy: Cochrane, MEDLINE, Embase, WHO ICTRP, ClinicalTrials.gov through April 10, 2018, no restrictions  
Quality assessment: Cochrane RoB tool  
Measure of treatment effect: SMD  
Data synthesis: meta-analysis | Studies: RCTs  
Participants: BC  
Interventions/comparator: MBSR plus anticancer therapy compared to anticancer therapy alone  
Outcomes: Quality of life, overall survival, fatigue, anxiety, depression, quality of sleep, adverse events | Studies: 14 RCTs (10 RCTs in MA)  
Participants: 1,756 BC patients (1571 BC patients in MA)  
Intervention: MBSR plus anticancer therapy (not defined)  
Control: anticancer therapy (not defined)  
Concurrent treatment: None in 6 RCTs; chemotherapy and/or radiotherapy allowed in 3 RCTs  
Outcome measures: BAI, BDI, CES-D, EORTC QLQ-30, EORTC QLC-BR23, FACT-B, FACT-ES, FSI, GAD-7, HADS, IBCSG QoL, ISI, MOS-SF-36, MOSS, PHQ-8, POMS, PSQI, SCL-90-R, STAI, survival | Intervention: MBSR plus anticancer therapy (not defined)  
Concurrent treatment: None in 6 RCTs; chemotherapy and/or radiotherapy allowed in 3 RCTs  
Results quality assessment: Unclear methods randomization and/or allocation concealment in 10 out of 14 RCTs; blinding high RoB in all RCTs; high or unclear risk of attrition bias in 8 out of 14 RCTs high or unclear risk of selective reporting in 13 out of 14 RCTs; low risk of other bias in 12 out of 14 RCTs  
Conclusions: May improve quality of life and fatigue in the short-term, anxiety and depression up to six months after the end of the intervention. No effects up to two years after the intervention.  
Anticancer therapy is given as an inclusion criterion; only 3 out of 10 RCTs in the meta-analysis fulfil this inclusion criterion. |
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| Zhang, 2015 (37) | Type of review: SR and MA  
Search strategy: Medline, Cochrane, EMBASE, Google Scholar through November 2014, no restrictions  
Quality assessment: Cochrane RoB tool  
Measure of treatment effect: SMD  
Data synthesis: meta-analysis | Studies: RCTs  
Participants: Any cancer  
Interventions/comparator: Mindfulness-based interventions compared to UC  
Outcomes: Depression, anxiety | Studies: 7 RCTs  
Participants: 888 mixed cancer patients  
Intervention: MBSR/MBCT/MBAT  
Control: UC  
Concurrent treatment: Not reported  
Outcome measures: HADS, HAM-D, POMS, SCL-90-R | Results for outcome measures: Moderate short-term effects on anxiety; large short-term effects on depression; no medium-term effects on anxiety or depression  
Results quality assessment: Low RoB except for blinding of participants  
Conclusions: Mindfulness-based interventions can relieve anxiety and depression among patients with cancer. Further research is warranted.  
No grey literature included; search strategy incomplete; treatment status unclear; RoB assessment not in line with other reviews (overly positive); safety not assessed. |
| Zhang, 2016 (38) | Type of review: SR and MA
Search strategy: PubMed, Cochrane, SCI, EBSCO, Chinese Biomedical Literature Database, Chinese Digital Journals Fulltext Database through January 2015, no restrictions
Quality assessment: Jadad Score, baseline comparability, allocation concealment
Measure of treatment effect: MD or SMD
Data synthesis: meta-analysis | Studies: RCTs
Participants: BC
Interventions/comparator: MBSR or MBCT compared to UC, WL or placebo
Outcomes: Physical health, psychological health, quality of life
Studies: 7 RCTs
Participants: 951 BC | Intervention: MBSR, Mindful Awareness Practices
Control: UC, WL
Concurrent treatment: Not reported
Outcome measures: BCPT, CES-D, CRS, FACT, FACT-B, FSI, MDASI, POMS, PSS, PSQI, SCL-90, STAI, QLACS
Results for outcome measures: Small short-term effects of MBSR compared to WL or UC on anxiety or emotional well-being, moderate short-term effects on fear of recurrence, large short-term effects on depression, no short-term effects on stress or spirituality.
Results quality assessment: 2 RCTs ≥ 4 on Jadad Score; 2 RCTs adequate randomization and allocation concealment; 2 RCTs blinded outcome assessors
Conclusions: Clear support for the efficacy of MBT as adjunctive treatment of BC. More research is needed
No grey literature included; validity of Jadad Score under discussion; overestimation of the findings in light of the limited study quality; publication bias not assessed; safety not assessed. | 

| Zhang, 2019 (39) | Type of review: SR and MA
Search strategy: Cochrane Library, CEntral, PsycINFO, Web of science, Medline, EMBASE, CNKI, CBM database through May 2018, no restrictions
Quality assessment: Cochrane RoB tool; NOS
Measure of treatment effect: MD
Data synthesis: meta-analysis | Studies: Not reported
Participants: Not reported
Interventions/comparator: Not reported
Outcomes: Not reported
Studies: 8 RCTs, 6 non-randomized CCTs
Participants: 1,505 BC | Intervention: MBSR
Control: UC, WL, no treatment
Concurrent treatment: Not reported
Results for outcome measures: Positive effects of MBSR on psychological function, cognitive function, fatigue, emotional wellbeing, anxiety, depression, stress, distress, mindfulness. No effects on pain, sleep quality, global quality of life.
Results quality assessment: Inconsistent reporting between text and tables, RoB in RCTs cannot be interpreted; good quality of non-randomized studies
Conclusions: Mindfulness-based interventions can relieve anxiety and depression among patients with cancer. Further research is warranted.
No grey literature included; inclusion criteria not reported; RoB assessment inconsistent and not interpretable; short- and long-term effects not differentiated. |
Abbreviations: 7DDR, 7-Day Diet Recall; BAI, Beck Anxiety Index; BC, women diagnosed with breast cancer; BCPT, Breast Cancer Prevention Trial Symptom Checklist; BDI, Beck Depression Index; BFI, Brief Fatigue Inventory; BPI, brief pain inventory; CAMS-R, cognitive and affective mindfulness scale-revised; CARS, Concerns About Recurrence Scale; CCT, controlled clinical trial; CES-D, Center for Epidemiological Studies Depression Scale; COC, Courtauld Emotional Control Scale; CPSS, Chinese Perceived Stress Scale; CSES, Coping Self-efficacy Scale; C-SOSI, Calgary Symptoms of Stress Inventory; DWI, Dealing with Illness Questionnaire; ECOG, everyday cognition scale; EORTC QLQ-30, European Organization for Research and Treatment quality of life questionnaire-30 Items; EORTC QLC BR23, European Organization for Research and Treatment quality of life questionnaire - Breast Cancer-23 Items; FACT, Functional Assessment of Cancer Therapy; FACT-B, Functional Assessment of Cancer Therapy-Breast; FACT-ES, Functional Assessment of Cancer Therapy-Endocrine Symptoms; FACT-Sp, Functional Assessment of Cancer Therapy-Spirituality; FFMQ, Five-Facet Mindfulness Questionnaire; FSI, Fatigue Symptom Inventory; GAD, Generalized Anxiety Disorder; HADS, Hospital Anxiety and Depression Scale; HAM-A, Hamilton Anxiety Rating Scale; HAM-D, Hamilton Depression Rating Scale; IBCSG QoL, International Breast Cancer Study Group Quality of Life Core Questionnaire; IES, Impact of Event Scale; ISI, Insomnia Severity Index; MA, meta-analysis; MAAS, Mindful attention Awareness Scale; MAC, Mental Adjustment to Cancer Scale; MBAT, Mindfulness-based Art Therapy; MBCT, Mindfulness-based Cognitive Therapy; MBSR, Mindfulness-based Stress Reduction; MD, mean difference; MDI, Major Depression Inventory; MDASI, MD Anderson Symptom Inventory; Mini-MAC, Mental Adjustment to Cancer Scale short form; MOS-SF, Medical Outcomes Studies Short-form General Health Survey; MOS-SSS, Medical Outcomes Social Support Survey; MOSS, Medical Outcome Study sleep scale; MSCL, Medical Symptom Checklist; NOS, Newcastle-Ottawa Assessment Scale; PEDro, Physiotherapy Evidence Database; PENN, Penn State Worry Questionnaire; PHQ, Patient Health Questionnaire Depression Scale; PFS-R, revised piper fatigue scale; POMS, Profile of Mood Scale; PRISMA, Preferred reporting items for systematic review and meta-analysis protocols; PSS, Perceived Stress Scale; PSQI, Pittsburgh Sleep Quality Index; QLACS, Quality of Life in Adult Cancer Survivors; RCT, randomized controlled trial; RoB, risk of bias; RRQ, Ruminaton-Reflection Questionnaire; RSES, Rosenberg Self-Esteem Scale; SCL-90-R, Symptom Checklist-90-Revised; SMD, standardized mean difference; SOC, Sense of Coherence Scale; SOSI, Symptoms of Stress Inventory; SR, systematic review; STAI, State-Trait Anxiety Inventory; UC, usual care; WBPI, Wisconsin brief pain inventory; WEMWBS, Warwick-Edinburgh mental wellbeing scale; WHO-5,WHO five-item well-being questionnaire; WL, wait list