Meditation for Depression

A Systematic Review of Mindfulness-Based Cognitive Therapy for Major Depressive Disorder

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Depression is a prevalent psychological health condition, and clinical diagnoses such as major depressive disorder (MDD) are associated with significant burden for patients and society in terms of reduced quality of life, lower productivity, increased rates of other health conditions, and increased health care costs. While several evidence-based treatments are included as frontline treatments for MDD in clinical practice guidelines, these interventions vary in their effectiveness, safety, and acceptability to different patient populations. Complementary and alternative medicine approaches to MDD treatment are becoming more common, and a number of military treatment facilities offer these services, including meditation therapies. However, the efficacy and effectiveness of meditation for treating MDD remains unclear.

The Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury is interested in determining the efficacy and comparative effectiveness of integrative medicine approaches for psychological health conditions. This report describes a systematic review of mindfulness-based cognitive therapy in the treatment of MDD, conducted during a two-year project on integrative medicine approaches for psychological health conditions. Key questions guiding this work focused on the efficacy and effectiveness of meditation for improving MDD symptoms and quality of life, as well as on describing the occurrence of adverse events related to meditation among MDD populations. This report should be of interest to health care providers and clinical policymakers interested in the treatment of MDD or the use of meditation.

A version of this report was provided to the committee for review in May 2015; we reproduce that version here, with minor editorial updates. None of the authors has any conflict of interest to declare.

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Abstract

Depression is a prevalent psychological health condition, and clinical diagnoses such as major depressive disorder (MDD) are associated with significant burden in terms of reduced quality of life, lower productivity, increased prevalence of other conditions, and increased health care costs. Several meditation approaches, including mindfulness-based cognitive therapy (MBCT), have shown promise in treating depression and preventing relapse. We conducted a systematic review of randomized controlled trials (RCTs) that assessed the efficacy and safety of MBCT for treating patients diagnosed with MDD.

We searched the databases PubMed, CINAHL, PsycINFO, Web of Science, Embase, CDSR, CENTRAL, DARE, clinicaltrials.gov, and PILOTS for English-language RCTs published through May 2015. Two independent reviewers screened retrieved publications using a set of inclusion and exclusion criteria, abstracted study-level data, and assessed the quality of included studies. Meta-analysis was performed using the Hartung-Knapp-Sidik-Jonkman method for random-effects models. Quality of evidence was assessed using the GRADE approach.

Seventeen studies met inclusion criteria. Adjunctive MBCT reduced depressive symptoms compared with a mix of comparators in patients with MDD (SMD $-0.77$; 95% CI $-1.21$, $-0.34$; 7 RCTs) and in patients with MDD or a history of MDD (SMD $-0.70$; 95% CI $-1.10$, $-0.29$; 12 RCTs), but there was substantial heterogeneity. MBCT plus treatment as usual (TAU) reduced depressive symptoms more than TAU alone (SMD $-0.92$; 95% CI $-1.57$, $-0.27$; 5 RCTs); based on two identified RCTs, MBCT compared with CBT without mindfulness meditation did not show statistically significant differences (SMD $-0.06$, 95% CI $-1.01$, $0.89$; 2 RCTs). MBCT was more effective than other comparators, particularly TAU, in the prevention of relapse in patients with a history of MDD (RR 0.72; 95% CI 0.56, 0.93; 6 RCTs). Five RCTs addressed adverse events; three reported that no adverse events occurred, and two reported adverse events that were deemed not related to the intervention. Differences in quality of life between MBCT and other interventions did not show statistically significant effects (SMD $-0.46$; 95% CI 0.97, 0.05; 5 RCTs), nor did the use of antidepressants (RR $-0.01$; 95% CI $-0.34$, 0.32; 5 RCTs). Very few studies assessed monotherapy MBCT, and the evidence was insufficient to determine its effect.

The MBCT evidence base is growing, and data exist for relapse and depressive symptom reduction. MBCT is more effective than TAU alone, but intervention-specific effects of MBCT—for example, compared with cognitive behavioral therapy without mindfulness meditation components—have to be investigated further.
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Introduction

Depression is a prevalent psychological health condition, and clinical diagnoses such as major depressive disorder (MDD) are associated with significant burden for patients and society in terms of reduced quality of life, lower productivity, increased prevalence of other conditions, and increased health care costs. Meditation is a mind-body technique that refers to a broad variety of practices with the general goal of training the mind through regulation of attention and/or emotion to affect body functions, symptoms, and state of being. Meditation practice has recently been embedded in existing therapeutic approaches, particularly mindfulness-based cognitive therapy (MBCT). MBCT is a standardized training program that combines cognitive therapy with mindfulness meditation. This review summarizes the current state of the evidence from randomized controlled trials (RCTs) testing the efficacy and safety of MBCT for patients diagnosed with MDD. Specifically, this systematic review aimed to answer the following primary key questions (KQs) and subquestions:

- KQ 1: Is meditation, as a monotherapy, more effective than treatment as usual (TAU), waitlists, no treatment, or other active treatments in reducing depressive symptoms in adults with MDD?
  - KQ 1a: Among publications that address monotherapy meditation as a treatment for adults with MDD, how common and severe are adverse events?
  - KQ 1b: Does the efficacy differ depending on the type of meditation used?
- KQ 2: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in reducing depressive symptoms in adults with MDD?
  - KQ 2a: Among publications that address adjunctive meditation as a treatment for adults with MDD, how common and severe are adverse events?
  - KQ 2b: Does the efficacy differ depending on the type of meditation used?
- KQ 3: Is meditation, as a monotherapy, more effective than TAU, waitlists, no treatment, or other active treatments in decreasing relapse rates in adults with MDD?\(^1\)
  - KQ 3a: Does the efficacy differ depending on the type of meditation used?
- KQ 4: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in decreasing relapse rates in adults with MDD?

\(^1\) A relapse occurs when a patient previously in remission experiences another episode of MDD less than a year after the previous episode; a recurrence occurs when a patient experiences a subsequent episode of major depression at least a year after the previous episode. Here we use the term relapse to include both relapses and recurrences.
− KQ 4a: Does the efficacy differ depending on the type of meditation used?

In addition, we aimed to answer the following secondary key questions:

- KQ 5: Is meditation, as a monotherapy, more effective than TAU, waitlists, no treatment, or other active treatments in improving health-related quality of life symptoms in adults with MDD?
- KQ 6: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in improving health-related quality of life symptoms in adults with MDD?
- KQ 7: Is meditation, as a monotherapy, more effective than TAU, waitlists, no treatment, or other active treatments in reducing antidepressant use in adults with MDD?
- KQ 8: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in reducing antidepressant use in adults with MDD?

Methods

To address our key questions, we conducted a systematic search of databases—PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PsycINFO, Web of Science, Embase, CDSR (Cochrane Database of Systematic Reviews), CENTRAL (Cochrane Central Register of Controlled Trials), DARE (Database of Abstracts of Reviews of Effects), clinicaltrials.gov, and PILOTS (Published International Literature on Traumatic Stress)—for English-language RCTs published through May 2015 testing the efficacy and safety of the meditation intervention MBCT, either as monotherapy or as adjunctive therapy, to treat adults with MDD or to prevent relapse of MDD. In addition, we screened bibliographies of prior systematic reviews and included studies.

Two independent reviewers used pre-established eligibility criteria to screen identified studies, abstract study-level information, and assess the quality of included studies. Outcomes of interest included depressive symptoms, relapse, health-related quality of life, and adverse events. Meta-analysis was performed with the Hartung-Knapp-Sidik-Jonkman method for random-effects models, a method suitable when the number of pooled studies is small and there is evidence of heterogeneity. The quality of evidence was assessed using the Grades of Recommendation, Assessment, Development, and Evaluation (or GRADE) approach.

Results

A total of 17 studies met the inclusion criteria for our review.

Key Question 1

We did not identify any study in patients with a current diagnosis of MDD that reported on the effectiveness of MBCT offered as monotherapy.
We identified one study in patients in full or partial remission that explicitly assessed MBCT as monotherapy and reported on depressive symptoms. The study reported a significantly greater reduction in depressive symptoms compared with waitlist (standardized mean difference [SMD] −1.11; 95% confidence interval [CI] −2.07, −0.15; 1 RCT).

Given the paucity of relevant studies, we cannot sufficiently answer the review question.

**Key Question 1a**

Only two studies explicitly assessed MBCT as monotherapy. One of the studies addressed adverse events and reported that none occurred; the other study did not report on adverse events.

**Key Question 1b**

There was insufficient information to determine whether the efficacy differs depending on the type of meditation used.

**Key Question 2**

Seven RCTs reported on depressive symptoms in adults with current MDD. There was moderate quality evidence of MBCT reducing depressive symptoms in patients with MDD compared with all comparators (SMD −0.77; 95% CI −1.21, −0.34; I² 63%; 7 RCTs).

Twelve RCTs examined adjunctive MBCT on depressive symptom scores. There was moderate evidence in support of the use of adjunctive MBCT over all interventions (SMD −0.72; 95% CI −1.14, −0.30; I² 85%; 12 RCTs). There was moderate evidence of its efficacy compared with TAU (SMD −0.92; 95% CI −1.57, −0.27; I² 80%; 5 RCTs). The evidence suggested that MBCT had no significant effect on residual depressive symptom scores among those with a history of depression, but not currently depressed (SMD −0.57; 95% CI −1.67, 0.53; I² 92%; 5 RCTs).

**Key Question 2a**

Five out of 15 studies addressed adverse events; of those, three reported that none occurred. One study reported that the adverse events were not related to the intervention; another study reported two adverse events, one of which occurred in the intervention arm of the study.

**Key Question 2b**

There was insufficient evidence to answer this question. A meta-regression analyzing differences between studies that followed the original MBCT manual versus studies that used a modified MBCT intervention indicated that deviations were not significantly associated with MBCT results. In individuals with recurrent depression, one study found a weak correlation between the amount of formal meditation practiced outside the class and change in depressive symptom score during MBCT.
Key Question 3

Only one study assessed whether monotherapy MBCT reduces relapse rates compared with two control groups: (1) antidepressants and (2) placebo plus clinical management in a sample of participants in remission with a history of at least three previous episodes of depression. Overall, there were no significant differences in relapse rates between either MBCT and antidepressants (relative risk [RR] 0.80; 95% CI 0.39, 1.62) or between monotherapy MBCT and placebo plus clinical management (RR 0.65; 95% CI 0.34, 1.62). Thus, there is insufficient evidence to draw any conclusions on this question.

Key Question 3a

There was insufficient evidence to answer this question.

Key Question 4

We identified no study in adults with MDD that reported long-term effects. Six studies addressed MBCT as an adjunct treatment that included an assessment of relapse. There was moderate quality evidence that adjunctive MBCT reduces relapse rates compared with all controls (RR 0.72; 95% CI 0.56, 0.93; I² 25%; 6 RCTs) and compared with TAU (RR 0.70; 95% CI 0.50, 0.98; I² 39%; 5 RCTs). Among patients with at least three prior episodes of depression in at least partial recovery, there was moderate evidence of the impact of adjunctive MBCT on relapse rates (RR 0.66; 95% CI 0.48, 0.90; I² 47%; 6 RCTs). However, the evidence does not support that MBCT reduces relapse rates among individuals with one or two previous depressive episodes (RR 1.96; 95% CI 0.31, 12.29; I² 0%; 2 RCTs).

Key Question 4a

There was insufficient evidence to answer this question. A meta-regression analyzing differences between studies that followed the original MBCT manual versus studies that used a modified MBCT intervention indicated that deviations were not significantly associated with relapse. A study of individuals with recurrent depression found that relapse rates were higher among individuals with more body scan practice six to 12 months after MBCT, but found no associations with other forms of practice. Another study of individuals with recurrent depression found no difference in relapse rates between two trained MBCT instructors of different backgrounds.

Key Question 5

We did not identify any study that assessed whether monotherapy MBCT was associated with improved health-related quality of life among adults with MDD.
Key Question 6

Five studies examined the effect of adjunctive MBCT on health-related quality of life; TAU was the only comparator used in more than one study. Overall, there was very low quality evidence of the effect of MBCT on health-related quality of life. The pooled estimate showed no significant differences in quality of life in the MBCT groups compared with control (SMD $-0.42$; 95% CI $-0.70$, $-0.14$; $I^2$ 71%; 5 RCTs).

Key Question 7

No studies addressed this question.

Key Question 8

We identified six studies of good and fair quality that examined the impact of adjunctive MBCT on antidepressant use or antidepressant costs. The pooled estimate of the four studies that examined use showed no statistically significant differences in antidepressant use in the MBCT groups compared with control (RR $-0.01$; 95% CI $-0.34$, $0.32$; $I^2$ 18%; 4 RCTs). A fifth study found no statistically significant differences in changes in antidepressant use, and the sixth study focused on costs. There is moderate evidence that MBCT does not affect antidepressant use.

Conclusions

The evidence supports the use of adjunctive MBCT to reduce depressive symptoms among those currently depressed. The evidence also supports the use of adjunctive MBCT to reduce relapse among those with a history of at least three previous depressive episodes, but not among those with a previous history of one or two previous depressive episodes. This issue warrants additional research.

Evidence on the use of monotherapy MBCT is insufficient to draw conclusions about its efficacy, either to reduce depressive symptoms among those currently depressed or among those with a history of depression to reduce relapse. These are areas where additional studies are needed. There is also insufficient evidence on the effect of MBCT on health-related quality of life. Few studies examined the effect of MBCT on measures of health-related quality of life, and there was a lack of consistency in comparators used and the measures of health-related quality of life included. Further exploration of this is warranted.

The reported occurrence of adverse events was infrequent and did not appear to be related to MBCT. However, only six of the included studies (one monotherapy and five adjunctive) reported on adverse events.
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>BDI</td>
<td>Beck Depression Inventory</td>
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<tr>
<td>CBT</td>
<td>cognitive behavioral therapy</td>
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<tr>
<td>CDSR</td>
<td>Cochrane Database of Systematic Reviews</td>
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<tr>
<td>CENTRAL</td>
<td>Central Register of Controlled Trials</td>
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<tr>
<td>CI</td>
<td>confidence interval</td>
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<tr>
<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
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<tr>
<td>CPE</td>
<td>cognitive psychological education</td>
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<tr>
<td>DARE</td>
<td>Database of Abstracts of Reviews of Effects</td>
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<tr>
<td>DoD</td>
<td>U.S. Department of Defense</td>
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<tr>
<td>DSM</td>
<td>Diagnostic and Statistical Manual of Mental Disorders</td>
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<td>GRADE</td>
<td>Grades of Recommendation, Assessment, Development, and Evaluation</td>
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<td>HRSD</td>
<td>Hamilton Rating Scale for Depression</td>
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<tr>
<td>ICD</td>
<td>International Classification of Diseases</td>
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<td>ITT</td>
<td>intention-to-treat</td>
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<td>KQ</td>
<td>key question</td>
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<td>MBCT</td>
<td>mindfulness-based cognitive therapy</td>
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<td>MDD</td>
<td>major depressive disorder</td>
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<td>PICOTSS</td>
<td>populations, interventions, comparators, outcomes, timing, setting, study design</td>
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<tr>
<td>PILOTS</td>
<td>Published International Literature on Traumatic Stress</td>
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<tr>
<td>RCT</td>
<td>randomized control trial</td>
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<tr>
<td>RR</td>
<td>relative risk</td>
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<tr>
<td>SMD</td>
<td>standardized mean difference</td>
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<tr>
<td>TAU</td>
<td>treatment as usual</td>
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<td>VA</td>
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Major depressive disorder (MDD) is a prevalent condition associated with significant burden for patients and society in terms of reduced quality of life, lower productivity, increased rates of other health conditions, and increased health care costs. In the general population of the United States, epidemiological studies of MDD suggest lifetime prevalence estimates between 13 and 16 percent and 12-month prevalence estimates between 5 and 7 percent among adults (Hasin et al., 2005; Kessler, Berglund, et al., 2003). Military service members and veterans with a history of combat exposure in the context of a deployment have been found to have elevated rates of probable MDD relative to the general population (Hoge et al., 2004; Schell and Marshall, 2008; Vaughan et al., 2011; Wells et al., 2010). Although the majority of individuals who develop MDD will experience remission of the major depressive episode within a year of onset (Coryell et al., 1994; Spijker et al., 2002), the probability of experiencing a recurrent episode is high. Roughly 80 percent of individuals who experience one episode of depression will experience another episode in the future (Judd, 1997). MDD is associated with significant medical, social, and economic consequences, including increased risk of various physical conditions, relationship problems, lost productivity, and health care costs (Donohue and Pincus, 2007; Kessler, 2012).

Several evidence-based treatments for MDD exist and are highlighted as front-line treatments for MDD in the U.S. Department of Veterans Affairs (VA) and U.S. Department of Defense (DoD) Clinical Practice Guidelines for Management of Major Depressive Disorder (Management of Major Depressive Disorder Working Group, 2009). However, these interventions vary in their effectiveness, safety, and acceptability to different patient populations, and many individuals who would benefit from treatment do not receive depression-related care (Tylee and Jones, 2005). The literature has documented a wide variety of barriers to mental health care among military personnel and veterans, including stigma, beliefs about mental health and mental health treatment, and access to mental health providers (Ben-Zeev et al., 2012; Vogt, 2011; Zinzow et al., 2012). Individuals with depression may use complementary and alternative medicine therapies (Kessler, Soukup, et al., 2001). One popular type of complementary and alternative medicine treatment that has been used in treating MDD is meditation (Su and Lifeng, 2011). Meditation is a mind-body technique that refers to a broad variety of practices with the general goal of training the mind through regulation of attention and/or emotion to affect body functions, symptoms, and state of being (Nash and Newberg, 2013; National Center for Complementary and Alternative Medicine, 2001, 2005). Meditation practice can also be embedded in a broader approach that includes movement (e.g., yoga, tai chi)—that is, movement meditation (Cahn and Polich, 2006; Goyal et al., 2014).

The only form of meditation specifically addressed in the current VA/DoD Clinical Practice Guideline on Management of Major Depressive Disorder is mindfulness-based cognitive therapy
MBCT), which is a standardized training program that combines the principles of cognitive therapy with the practice of mindfulness meditation. The guideline indicates that MBCT may be employed for patients at high risk of relapse during the treatment continuation phase and comments on the lack of research comparing mindfulness-based interventions with control groups, medication, and psychotherapy during initial treatment (Management of Major Depressive Disorder Working Group, 2009).

This review seeks to examine the current state of the evidence regarding the efficacy and safety of MBCT for MDD.

Key Questions

We conducted a systematic review to identify randomized control trials (RCTs) testing the efficacy and safety of meditation to treat individuals with MDD. Specifically, this systematic review aimed to answer the following primary key questions (KQs) and subquestions:

- **KQ 1**: Is meditation, as a monotherapy, more effective than treatment as usual (TAU), waitlists, no treatment, or other active treatments in reducing depressive symptoms in adults with MDD?
  - **KQ 1a**: Among publications that address monotherapy meditation as a treatment for adults with MDD, how common and severe are adverse events?
  - **KQ 1b**: Does the efficacy differ depending on the type of meditation used?
- **KQ 2**: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in reducing depressive symptoms in adults with MDD?
  - **KQ 2a**: Among publications that address adjunctive meditation as a treatment for adults with MDD, how common and severe are adverse events?
  - **KQ 2b**: Does the efficacy differ depending on the type of meditation used?
- **KQ 3**: Is meditation, as a monotherapy, more effective than TAU, waitlists, no treatment, or other active treatments in decreasing relapse rates in adults with MDD?
  - **KQ 3a**: Does the efficacy differ depending on the type of meditation used?
- **KQ 4**: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in decreasing relapse rates in adults with MDD?
  - **KQ 4a**: Does the efficacy differ depending on the type of meditation used?

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2 A relapse occurs when a patient previously in remission experiences another episode of MDD less than a year after the previous episode; a recurrence occurs when a patient experiences a subsequent episode of major depression at least a year after the previous episode. Here we use the term relapse to include both relapses and recurrences.
In addition, we aimed to answer the following secondary key questions:

- **KQ 5**: Is meditation, as a monotherapy, more effective than TAU, waitlists, no treatment, or other active treatments in improving health-related quality of life symptoms in adults with MDD?
- **KQ 6**: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in improving health-related quality of life symptoms in adults with MDD?
- **KQ 7**: Is meditation, as a monotherapy, more effective than TAU, waitlists, no treatment, or other active treatments in reducing antidepressant use in adults with MDD?
- **KQ 8**: Is meditation, as an adjunctive therapy, more effective than TAU, waitlists, no treatment, or other active treatments in reducing antidepressant use in adults with MDD?
Chapter Two: Methods

Search Strategy

We searched the databases PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), PsycINFO, Web of Science, Embase, CDSR (Cochrane Database of Systematic Reviews), CENTRAL (Cochrane Central Register of Controlled Trials), DARE (Database of Abstracts of Reviews of Effects), and PILOTS (Published International Literature on Traumatic Stress) for meditation studies published through January 2015. We performed an updated search in May 2015 that focused on MBCT. In addition, we screened studies included in prior systematic reviews related to this topic. We also searched Clinicaltrials.gov and contacted authors of all relevant, completed trials for which published data were not available to invite the submission of in-press publications.

The search strategy was developed by a reference librarian for RAND’s Knowledge Services and was informed by search results of existing reviews. The search strings are described in Appendix A.

Eligibility Criteria

The inclusion and exclusion criteria we applied to retrieved publications were developed using the framework of participants, interventions, comparators, outcomes, timing, settings, and study design, or PICOTSS.

- **Participants**: Studies were limited to those that focused on adults, male and female, who are at least 18 years of age and have been diagnosed with MDD. MDD was defined as meeting the criteria for a clinical diagnosis of MDD according to the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychiatric Association, 2013) or International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM; National Center for Health Statistics, 2010) criteria. We included studies of populations with a history of MDD if they reported data on depressive symptoms or relapse.
- **Interventions**: Studies were included that examined the effect of MBCT. We included studies reporting deviations from the original MBCT protocol (Segal, Williams, and Teasdale, 2002) if MBCT was clearly referred to.
- **Comparators**: Studies that utilized TAU, waitlist control, attention control, no treatment, or other active treatments as the comparator were included. Studies that exclusively compared MBCT with other forms of complementary and alternative medicine (e.g., acupuncture) were excluded.
- **Outcomes**: Studies that reported one or more of the following outcomes were included: depression symptoms, treatment response, remission, relapse/recurrence, and health-related quality of life.
• **Timing:** Studies could involve any treatment duration and follow-up period.
• **Setting:** Studies were not limited by setting.
• **Study design:** Included studies were limited to individually- or cluster-randomized controlled trials only.
• **Other limiters:** Studies had to be published in English to be eligible. Data reported only in conference proceedings or abstracts were excluded.

### Inclusion Screening

Two independent reviewers screened titles and abstracts of retrieved citations following a pilot exercise to ensure similar interpretation of the inclusion and exclusion criteria. Citations judged to be potentially eligible by at least one reviewer were obtained as full text. Two independent reviewers screened full-text studies against predefined inclusion and exclusion criteria; any disagreements between the reviewers were resolved through discussion within the review team. The flow of citations throughout this process was documented in an electronic database, and reasons for exclusion of publications that underwent full-text screening were recorded in the database.

### Data Extraction

Each publication was abstracted by two reviewers using electronic data collection forms designed by the project lead, with input from the project team. Reviewers pilot-tested the data collection forms on a few well-reported studies, modified the forms, and performed a final pilot of the forms on a random selection of included studies to ensure agreement of interpretation. The reviewers then independently abstracted study-level data in an electronic database. All discrepancies were resolved by PhD-level staff with input from both reviewers in a group setting.

Study-level data were abstracted for the following information:

• **Participants:** gender, age, method of depression identification, baseline depression scores
• **Interventions:** type of meditation, dosage (intensity, frequency, duration), and co-intervention(s)
• **Comparators:** type of comparator
• **Outcomes** (depressive symptom score, response to treatment, remission, relapse, health-related quality of life, adverse events) for each follow-up point of measurement: domain, method of measurement, metric of data expression (e.g., means, proportions)
• **Timing:** timing of outcome assessment(s)
• **Setting:** country where the trial occurred
• **Study design:** purpose, inclusion and exclusion criteria, starting and ending sample size, items relevant to risk of bias and quality ratings

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3 *Response to treatment* is at least a 50-percent reduction in the Hamilton Rating Scale for Depression (HRSD) score.
When different reports existed for the same study, descriptions of participants were compared to ensure that data from the same study populations were included in the review only once.

Risk of Bias

Project leaders assessed the risk of bias of included RCTs using the Cochrane Risk of Bias tool (Higgins et al., 2011). Specifically, the reviewers assessed risk of bias related to the following: random sequence generation (selection bias), allocation concealment (selection bias), blinding of participants (performance bias), blinding of outcome assessors (detection bias), completeness of reporting outcome data (attrition bias), and selective outcome reporting (reporting bias). Other biases related to the U.S. Preventive Services Task Force’s criteria for internal validity of included studies were also assessed, namely those related to equal distribution among groups of potential confounders at baseline; cross-overs or contamination between groups; equal, reliable, and valid outcome measurement; clear definitions of interventions; and intention-to-treat (ITT) analysis (U.S. Preventive Services Task Force, 2008). These criteria were used to rate the quality of evidence of individual included studies using the following guidelines (Lewin Group and ECRI Institute, 2014; U.S. Preventive Services Task Force, 2008):

- **Good**: Comparable groups are initially assembled and maintained throughout the study with at least 80-percent follow-up; reliable, valid measurement is used and applied equally to all groups; interventions are clearly described; all important outcomes are considered; appropriate attention is given to confounders in analysis; ITT analysis is used.

- **Fair**: One or more of the following issues is found in the study: some though not major differences between groups exist at follow-up; measurement instruments are acceptable but not ideal, though are generally applied equally; some but not all important outcomes are considered; some but not all potential confounders are accounted for in analyses. ITT analysis is used.

- **Poor**: One or more of the following “fatal flaws” is found in the study: initially assembled groups are not comparable or maintained throughout the study; unreliable or invalid measurements are used or applied unequally across groups; key confounders are given little to no attention in analyses; ITT is not used.

Data Synthesis

The primary aim of this systematic review was to identify whether meditation in the format of MBCT is effective in improving MDD symptoms and preventing relapse. A secondary outcome was adverse events. Results are described separately for MBCT delivered as monotherapy versus adjunctive therapy. We differentiated patients who had a clinical diagnosis of MDD, were experiencing a depressive episode, or had residual symptoms when they enrolled in the study from patients with prior MDD but who were in remission.
Treatment effects for continuous outcomes were computed as standardized mean differences (SMDs) together with their 95-percent confidence intervals (CIs) to ensure comparability of effect sizes across studies using different outcome measures. Relative risks (RRs) were computed for dichotomous variables (i.e., relapse). Results are reported such that SMDs less than zero and RRs less than one favor MBCT.

We used meta-analysis to pool results across included studies for depressive symptoms, relapse, and health-related quality of life. We used the Hartung-Knapp-Sidik-Jonkman method for random effects models (Hartung, 1999; Hartung and Knapp, 2001; Sidik and Jonkman, 2007). This method may be preferred when the number of studies pooled is small and when there is evidence of heterogeneity (IntHout, Ioannidis, and Borm, 2014). It produces more-robust error rates than the DerSimonian and Laird method (Sánchez-Meca and Marín-Martínez, 2008).

We calculated treatment effects at postintervention or the closest follow-up point to postintervention reported in the individual studies. When multiple depression measures were available, we used HRSD scores to assess treatment effects on depression symptoms, followed by the Beck Depression Inventory (BDI). When multiple health-related quality of life domains were reported, we used the psychological domain (rather than physical or social). Outcome data were based on ITT analyses reported in the included studies. In the absence of ITT data, we used the number of patients at follow-up. When studies reported on more than one comparator, the pooled analyses used a passive comparator where possible (e.g., waitlist, TAU). We also investigated publication bias for all main analyses with sufficient data using Begg’s rank correlation test for funnel plot asymmetry (Begg and Mazumdar, 1994) and Egger’s test for funnel plot asymmetry (Egger et al., 1997).

Subgroup analyses grouped studies by comparator. Meta-regression was used to determine the effect of effect modifiers.

Quality of Evidence

The quality of evidence was assessed for major outcomes using the Grades of Recommendation, Assessment, Development, and Evaluation (or GRADE) approach, in which the body of evidence was assessed based on the following dimensions: study limitations (low, medium, or high), directness (direct or indirect), consistency (consistent, inconsistent, or unknown), and precision (precise or imprecise).

The quality of evidence was graded on a four-item scale:

- **High** indicates that the review authors are very confident that the effect estimate lies close to the true effect for a given outcome, as the body of evidence has few or no deficiencies. As such, the reviewers believe the findings are stable: i.e., further research is very unlikely to change confidence in the effect estimate.

- **Moderate** indicates that the review authors are moderately confident that the effect estimate lies close to the true effect for a given outcome, as the body of evidence has some deficiencies. As such, the reviewers believe that the findings are likely to be stable,
but further research may change confidence in the effect estimate and may even change the estimate.

- **Low** indicates that the review authors have limited confidence that the effect estimate lies close to the true effect for a given outcome, as the body of evidence has major or numerous (or both) deficiencies. As such, the reviewers believe that additional evidence is needed before concluding either that the findings are stable or that the effect estimate lies close to the true effect.
- **Very low** indicates that the review authors have very little confidence that the effect estimate lies close to the true effect for a given outcome, as the body of evidence has very major deficiencies. As such, the true effect is likely to be substantially different from the estimated effect; thus, any estimate of effect is very uncertain.

**Protocol Deviations**

In order to provide more-targeted information to answer the review questions, we did not apply the depression scale cut-offs as described in the systematic review protocol, but limited included studies to those that reported a clinical diagnosis of MDD. An initial screen of the identified literature indicated substantial clinical diversity; depression is a symptom relevant to a number of mental disorders, patient characteristics vary, and it is unclear whether and how treatment effects will translate to patients with MDD.

In addition, we restricted the systematic review to MBCT in order to be able to provide clear effectiveness statements. The initial searches indicated that the effect of other interventions—such as person-based cognitive therapy, compassion-mindfulness therapy, mindfulness meditation, mantra meditation, mindfulness training, miscellaneous group meditation formats, Chan-based mind-body intervention, Buddhist walking meditation, tai chi, diverse yoga approaches, or qigong interventions—have been investigated in only a very small number of studies in patients with a clinical diagnosis of MDD. Furthermore, test searches indicated that for each known intervention, because of the lack of standardization of the intervention description, including the name of the intervention (e.g., “tai chi,” “tai-chi,” “tai ji,” “tai-ji,” “taiji,” “t’ai chi,” “t’ai chi,” “taijiquan,” OR “shadow boxing”), multiple searches in multiple sources would need to be undertaken to ensure that all relevant studies were found. Meditation is an element in a variety of very diverse approaches, which requires extensive and exhaustive literature searches, and multiple systematic reviews are necessary to summarize the effect of each of the diverse existing meditation interventions, which exceeds the resources of this project.
Chapter Three: Results

Results of Literature Searches

Our search of the electronic databases identified 7,290 publications; two additional studies were found by scanning citations (see Figure 3.1). After duplicates were removed, 4,072 publications were included for title and abstract screening, of which 3,357 were excluded because one or more of the exclusion criteria were met. An additional 690 publications were excluded during full-text review (listed in Appendix B). A total of 25 publications describing 17 unique RCTs of MBCT were identified and met the inclusion criteria for our review (described in Table 3.1).

Figure 3.1. Publication Review and Inclusion

- Records identified through electronic databases (7,290 total citations; 4,655 unique)
- 4,657=unique citations from all sources
- Title and abstract screening n=4,072
- Full-text review n=714
- Data abstraction n=17 studies, 25 publications
- Additional articles identified through scan of citations in related review articles (2)
- Additional duplicates identified n=585
- Excluded n=3,357 Unable to locate n=1
- Excluded N=689
  - Not MDD (398)
  - Participants are children (1)
  - Not MBCT (39)
  - Not an RCT (219)
  - No relevant outcome data assessed (9)
  - Not English (1)
  - Conference proceeding or abstract (22)
**Key Question**

For KQ 1 on the effect of MBCT as monotherapy for depressive symptoms, we identified one RCT that reported on the effect of treatment on depressive symptoms using standardized scales (Britton et al., 2010). The study did not examine response to treatment (i.e., at least a 50-percent reduction in depressive symptom score on a standardized scale) or remission.

For KQ 1a, one study provided information on the frequency and severity of adverse events that occurred with monotherapy MBCT (Britton et al., 2010).

For KQ 2 on the effect of MBCT as adjunctive therapy for depressive symptoms, we identified 12 RCTs\(^4\) that reported depressive symptom scores using standardized scales (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Chiesa, Mandelli, and Serretti, 2012; Forkmann et al., 2014; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Hepburn et al., 2009; Jermann et al., 2013; Keune et al., 2011; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; Shahar et al., 2010; van Aalderen et al., 2012). One study examined response to treatment (Barnhofer et al., 2009).

For KQ 2a, we found six studies that provided information on the frequency and severity of adverse events with adjunctive MBCT used to treat MDD (Barnhofer et al., 2009; Forkmann et al., 2014; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008; Shahar et al., 2010; Williams, Crane, et al., 2014).

For KQ 3, we identified one RCT that examined relapse after monotherapy MBCT (Segal et al., 2010), and for KQ 4, we identified six studies that examined relapse after adjunctive MBCT (Godfrin and van Heeringen, 2010; Jermann et al., 2013; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000; Williams, Crane, et al., 2014).

We found no monotherapy MBCT studies that provided information on health-related quality of life for KQ 5. For KQ 6, we found five adjunctive MBCT studies that provided information on health-related quality of life (Chiesa, Mandelli, and Serretti, 2012; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008; Manicavasgar, Parker, and Perich, 2011; van Aalderen et al., 2012).

We did not identify any RCTs that assessed reductions in antidepressant use following monotherapy MBCT (KQ 7), but we did identify six RCTs that investigated antidepressant use or costs of antidepressants for adjunctive MBCT (KQ 8) (Barnhofer et al., 2009; Bondolfi et al., 2010; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000).

\(^4\) The number of citations may be larger than the number of RCTs identified. This occurs when more than one publication on the same RCT reported analyses relevant and unique to the review.
Table 3.1. Evidence Base for Key Questions

<table>
<thead>
<tr>
<th>Key Question</th>
<th>Number of Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is meditation, as a monotherapy, more effective than TAU, waitlists, no</td>
<td>1 RCT of monotherapy</td>
</tr>
<tr>
<td>treatment, or other active treatments in reducing depressive symptoms in</td>
<td>MBCT with efficacy data</td>
</tr>
<tr>
<td>adults with MDD?</td>
<td></td>
</tr>
<tr>
<td>1a Among publications that address monotherapy meditation as a treatment</td>
<td>1 RCT of monotherapy</td>
</tr>
<tr>
<td>for adults with MDD, how common and severe are adverse events?</td>
<td>MBCT with safety data</td>
</tr>
<tr>
<td>1b Does the efficacy differ depending on the type of meditation used (e.g.,</td>
<td>1 RCT of monotherapy</td>
</tr>
<tr>
<td>MBCT, mindfulness-based stress reduction, yoga, tai chi)?</td>
<td>MBCT with efficacy data</td>
</tr>
<tr>
<td>2. Is meditation, as an adjunctive therapy, more effective than TAU, waitlists,</td>
<td>12 RCTs of adjunctive</td>
</tr>
<tr>
<td>no treatment, or other active treatments in reducing depressive symptoms</td>
<td>MBCT with efficacy data</td>
</tr>
<tr>
<td>in adults with MDD?</td>
<td></td>
</tr>
<tr>
<td>2a Among publications that address adjunctive meditation as a treatment for</td>
<td>5 RCTs of adjunctive</td>
</tr>
<tr>
<td>adults with MDD, how common and severe are adverse events?</td>
<td>MBCT with safety data</td>
</tr>
<tr>
<td>2b Does the efficacy differ depending on the type of meditation used?</td>
<td>12 RCTs of adjunctive</td>
</tr>
<tr>
<td></td>
<td>meditation with efficacy data</td>
</tr>
<tr>
<td>3. Is meditation, as a monotherapy, more effective than TAU, waitlists, no</td>
<td>1 RCT of monotherapy</td>
</tr>
<tr>
<td>treatment, or other active treatments in decreasing relapse rates in adults</td>
<td>MBCT with relapse data</td>
</tr>
<tr>
<td>with MDD?</td>
<td></td>
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<tr>
<td>3a Does the efficacy differ depending on the type of meditation used?</td>
<td>1 RCT of monotherapy</td>
</tr>
<tr>
<td></td>
<td>MBCT with relapse data</td>
</tr>
<tr>
<td>4. Is meditation, as an adjunctive therapy, more effective than TAU, waitlists,</td>
<td>6 RCTs of adjunctive</td>
</tr>
<tr>
<td>no treatment, or other active treatments in decreasing relapse rates in</td>
<td>MBCT with relapse data</td>
</tr>
<tr>
<td>adults with MDD?</td>
<td></td>
</tr>
<tr>
<td>4a Does the efficacy differ depending on the type of meditation used?</td>
<td>6 RCTs of adjunctive</td>
</tr>
<tr>
<td></td>
<td>MBCT with relapse data</td>
</tr>
<tr>
<td>5. Is meditation, as a monotherapy, more effective than TAU, waitlists, no</td>
<td>0 RCTs of monotherapy</td>
</tr>
<tr>
<td>treatment, or other active treatments in improving health-related quality</td>
<td>MBCT with health-related</td>
</tr>
<tr>
<td>of life in adults with MDD?</td>
<td>quality of life data</td>
</tr>
<tr>
<td>6. Is meditation, as an adjunctive therapy, more effective than TAU, waitlists,</td>
<td>5 RCTs of adjunctive</td>
</tr>
<tr>
<td>no treatment, or other active treatments in improving health-related quality of life in adults with MDD?</td>
<td>MBCT with health-related quality of life data</td>
</tr>
<tr>
<td>7. Is meditation, as a monotherapy, more effective than TAU, waitlists, no</td>
<td>0 RCTs of monotherapy</td>
</tr>
<tr>
<td>treatment, or other active treatments in reducing antidepressant use in</td>
<td>MBCT with antidepressant use</td>
</tr>
<tr>
<td>adults with MDD?</td>
<td></td>
</tr>
<tr>
<td>8. Is meditation, as an adjunctive therapy, more effective than TAU, waitlists,</td>
<td>6 RCTs of adjunctive</td>
</tr>
<tr>
<td>no treatment, or other active treatments in reducing antidepressant use in</td>
<td>MBCT with antidepressant use</td>
</tr>
<tr>
<td>adults with MDD?</td>
<td></td>
</tr>
</tbody>
</table>

**Design**

Nine RCTs randomized participants by using a block randomization design, seven studies randomized individual participants rather than clusters of participants, and one study assigned participants to groups and randomized the groups. The studies included in this review varied widely in size, ranging from 18 to 274 enrolled participants. Three RCTs included fewer than 50 participants; eight enrolled between 50 and 100 participants; four included 100 to 200 participants; and two studies enrolled more than 200 participants. Six reported an a priori power calculation with a target sample size, nine studies reported insufficient power for post-hoc analyses, and two studies did not report information about power. Fifteen studies were two-arm RCTs, while two were three-arm RCTs.
**Location**

The studies were performed in a variety of countries—two in the United States, five in the United Kingdom, two in the Netherlands, and one in each of the following countries: Australia, Belgium, Canada, Germany, Iran, Italy, and Switzerland. One study had sites in both Canada and the United Kingdom.

**Participants**

The average age of participants ranged from 32 to 49 years in the studies that reported patient characteristics. One study did not report information about age of participants. The proportion of men in the studies ranged from 16 to 37 percent.

**Interventions**

Studies occurring after 2002 reported using the MBCT manual developed by Segal, Williams, and Teasdale (2002). While all reported having eight weekly sessions, the length of the sessions varied from two to three hours. Studies reported holding up to four follow-up sessions after the completion of the MBCT intervention. Three studies reported modifying the MBCT program. Two made adjustments to address suicidality and acute symptoms (Barnhofer et al., 2009; Williams, Crane, et al., 2014). One study removed the yoga component (Manicavasgar, Parker, and Perich, 2011).

**Comparators**

Comparators in the studies varied. Monotherapy studies used waitlist, antidepressants, and antidepressant placebo plus clinical management as comparators. For adjunctive MBCT studies, the most common comparators were TAU (ten studies) and antidepressants (four studies) controls.

**Outcome Measures**

The length of follow-up ranged from immediately postintervention to 15 months after treatment was completed. Thirteen studies reported depressive symptom scores as an outcome. Seven of the studies assessed relapse. Five studies reported measures of health-related quality of life. Seven studies reported adverse events or side effects.

**Risk of Bias**

Table 3.2 summarizes the authors’ assessment of the risk of bias for the included studies using the Cochrane Risk of Bias tool for RCTs. Four studies were assigned a “good” quality rating (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000), five studies were rated “fair” quality (Chiesa, Mandelli, and Serretti, 2012; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al.,
2008; Segal et al., 2010), and eight studies were rated “poor” quality (Britton et al., 2010; Hepburn et al., 2009; Keune et al., 2011; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; Shahar et al., 2010; van Aalderen et al., 2012; Williams, Crane, et al., 2014). In addition, seven studies had an overall rating of poor because of a lack of ITT analysis.

**Random sequence generation.** Two studies had unclear selection bias because they did not report their method for randomizing study participants (Hepburn et al., 2009; Omidi et al., 2013). Of the remaining studies, 14 were rated as low risk because they reported adequate random sequence generation methods (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Britton et al., 2010; Chiesa, Mandelli, and Serretti, 2012; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Keune et al., 2011; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Segal et al., 2010; Shahar et al., 2010; Teasdale, Segal, et al., 2000; van Aalderen et al., 2012; Williams, Holmes, et al., 2013; Williams, Crane, et al., 2014). One study was at high risk for selection bias because of inadequate randomization methods (Manicavasgar, Parker, and Perich, 2011).

**Allocation concealment.** Five studies had unclear selection bias because they did not report their allocation concealment method (Chiesa, Mandelli, and Serretti, 2012; Hepburn et al., 2009; Kuyken, Byford, et al., 2008; Omidi et al., 2013; van Aalderen et al., 2012). Twelve other studies did describe their method of allocation concealment and were rated as low risk (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Britton et al., 2010; Forkmann et al., 2014; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Jermann et al., 2013; Keune et al., 2011; Ma and Teasdale, 2004; Manicavasgar, Parker, and Perich, 2011; Segal et al., 2010; Shahar et al., 2010; Teasdale, Segal, et al., 2000; Williams, Crane, et al., 2014).

**Blinding of participants.** Two studies had unclear selection bias because they did not report the approach for ensuring blinding of participants (Chiesa, Mandelli, and Serretti, 2012; Omidi et al., 2013). Fifteen studies did not report adequate blinding approaches and were rated as high risk (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Britton et al., 2010; Forkmann et al., 2014; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Jermann et al., 2013; Keune et al., 2011; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Manicavasgar, Parker, and Perich, 2011; Segal et al., 2010; Shahar et al., 2010; Teasdale, Segal, et al., 2000; van Aalderen et al., 2012; Williams, Crane, et al., 2014).

**Blinding of outcome assessors.** Three studies had unclear risk of detection bias because they did not report whether outcome assessors were blind to participation allocation to study arms (Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; van Aalderen et al., 2012). Fourteen studies reported the outcome assessors were blinded to intervention assignment or the study outcomes were self-reported instruments and were low risk (Barnhofer et al., 2009; Bondolfi et al., 2010; Britton et al., 2010; Chiesa, Mandelli, and Serretti, 2012; Forkmann et al., 2014; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Hepburn et al., 2009; Jermann et al., 2013; Keune et al., 2011; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Segal et al., 2010; Shahar et al., 2010; Teasdale, Segal, et al., 2000; Williams, Crane, et al., 2014).
Incomplete outcome data. Seven studies had low risk of attrition bias (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Forkmann et al., 2014; Geschwind et al., 2012; Jermann et al., 2013; Ma and Teasdale, 2004; Omidi et al., 2013; Teasdale, Segal, et al., 2000; Williams, Crane, et al., 2014). Nine studies were at high risk for attrition bias (Britton et al., 2010; Chiesa, Mandelli, and Serretti, 2012; Godfrin and van Heeringen, 2010; Hepburn et al., 2009; Keune et al., 2011; Kuyken, Byford, et al., 2008; Manicavasgar, Parker, and Perich, 2011; Segal et al., 2010; Shahar et al., 2010). One study was unclear (van Aalderen et al., 2012).

Selective outcome reporting. Six studies had low risk of reporting bias because we were able to identify an a priori trial registration entry (Godfrin and van Heeringen, 2010; Keune et al., 2011; Kuyken, Byford, et al., 2008; Segal et al., 2010; van Aalderen et al., 2012; Williams, Crane, et al., 2014). Ten studies had unclear risk of reporting bias because we were unable to identify such an entry (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Britton et al., 2010; Chiesa, Mandelli, and Serretti, 2012; Forkmann et al., 2014; Geschwind et al., 2012; Hepburn et al., 2009; Jermann et al., 2013; Ma and Teasdale, 2004; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; Shahar et al., 2010; van Aalderen et al., 2012). One study was high risk because we identified a trial registration entry and the study did not report on all identified outcomes (Teasdale, Segal, et al., 2000).

Other. One study did not provide an adequate description of the study to be able to determine whether other risk to biases existed (Godfrin and van Heeringen, 2010). Five studies were low risk for other biases because no other issues were identified (Bondolfi et al., 2010; Chiesa, Mandelli, and Serretti, 2012; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000). The remainder of the studies suffered from one or more potential biases (Barnhofer et al., 2009; Batink et al., 2013; Britton et al., 2010; Geschwind et al., 2012; Hepburn et al., 2009; Keune et al., 2011; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; Segal et al., 2010; Shahar et al., 2010; van Aalderen et al., 2012; Williams, Crane, et al., 2014).
Table 3.2. Study Quality/Risk of Bias for Each MBCT Randomized Controlled Trial

<table>
<thead>
<tr>
<th>Study</th>
<th>Random Sequence Generation (selection bias)</th>
<th>Allocation Concealment (selection bias)</th>
<th>Blinding of Participants (performance bias)</th>
<th>Blinding of Outcome Assessors (detection bias)</th>
<th>Completeness of Reporting Outcome Data (attrition bias)</th>
<th>Selective Outcome Reporting (reporting bias)</th>
<th>Other Biases</th>
<th>USPSTF Quality Rating</th>
</tr>
</thead>
<tbody>
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<td>Low risk</td>
<td>Low risk</td>
<td>High risk</td>
<td>Low risk</td>
<td>Low risk</td>
<td>Unclear</td>
<td>Differences in chronic depression among completers at baseline</td>
<td>Good</td>
</tr>
<tr>
<td>Batink et al., 2013; Geschwind et al., 2012; Forkmann et al., 2014</td>
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<td>Low risk</td>
<td>High risk</td>
<td>Low risk</td>
<td>Low risk</td>
<td>Unclear</td>
<td>Differences in employment and comorbid anxiety disorder; marginal differences in gender and use of antidepressants at baseline</td>
<td>Fair</td>
</tr>
<tr>
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<td>Low risk</td>
<td>High risk</td>
<td>Low risk</td>
<td>Low risk</td>
<td>Unclear</td>
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<td>Low risk</td>
<td>High risk</td>
<td>Low risk</td>
<td>High risk</td>
<td>Unclear</td>
<td>Differential dropout between arms; no ITT analysis</td>
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</tr>
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<td>High risk</td>
<td>Unclear</td>
<td>None</td>
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</tr>
<tr>
<td>Godfrin and van Heeringen, 2010</td>
<td>Low risk</td>
<td>Low risk</td>
<td>High risk</td>
<td>Low risk</td>
<td>High risk</td>
<td>Low risk</td>
<td>Unclear</td>
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<tr>
<td>Hepburn et al., 2009; Crane et al., 2008</td>
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<td>Low risk</td>
<td>High risk</td>
<td>Unclear</td>
<td>No ITT analysis; non-completers were significantly younger than completers</td>
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<td>No ITT analysis</td>
<td>Poor</td>
</tr>
<tr>
<td>Study</td>
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<td>Allocation Concealment (selection bias)</td>
<td>Blinding of Participants (performance bias)</td>
<td>Blinding of Outcome Assessors (detection bias)</td>
<td>Completeness of Reporting Outcome Data (attrition bias)</td>
<td>Selective Outcome Reporting (reporting bias)</td>
<td>Other Biases</td>
<td>USPSTF Quality Rating</td>
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<td>-----------------------</td>
</tr>
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<tr>
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<td>Unclear</td>
<td>No ITT analysis</td>
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<td>Unclear</td>
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<td>High risk</td>
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<td>Shahar et al., 2010</td>
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<td>Unclear</td>
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<td>Van Aalderen et al., 2012</td>
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<td>Unclear</td>
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<tr>
<td>Williams, Crane, et al., 2014</td>
<td>Low risk</td>
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<td>Low risk</td>
<td>Low risk</td>
<td>No ITT analysis; non-completers were significantly younger than completers</td>
<td>Poor</td>
</tr>
</tbody>
</table>

*a Other biases include balance of confounders, cross-overs/contamination, measurement, intervention definition, and ITT analysis.

*b The USPSTF criteria (U.S. Preventive Services Task Force, 2008) for study quality involve assessment of various factors related to the internal validity of the study. “Good” is the highest ranking, which involves comparable groups with low attrition, with outcomes being reliably and validly measured and analyzed. “Fair” is the next highest rating and involves studies with one or a few potential concerns (e.g., some though not major differences between groups exist at follow-up), though intention-to-treat analysis was performed. “Poor” is the lowest ranking and involves studies with one or more “fatal flaws” (e.g., no intention-to-treat analysis).
KQ 1: Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Depressive Symptoms in Adults with MDD?

We did not identify any study in patients with a current diagnosis of MDD that reported on the effectiveness of MBCT given as monotherapy.

We identified one study in patients in full or partial remission that explicitly assessed MBCT as monotherapy and reported on depressive symptoms. The RCT with 26 enrolled participants (Britton et al., 2010) was rated poor quality due to not performing ITT analyses and having unequal dropout in the study arms. The intervention consisted of eight weekly sessions and a one-day retreat. Study participants had a history of at least three depressive episodes. The study reported significantly greater reductions in depressive symptom scores in the MBCT arm compared with waitlist (SMD $-1.11$; 95% CI $-2.07$, $-0.15$; 1 RCT).

Three studies (Keune et al., 2011; Manicavasgar, Parker, and Perich, 2011; Shahar et al., 2010) were identified that did not indicate systematic co-interventions, such as antidepressants or TAU as recommended by their primary health care provider. Combined with the explicit monotherapy study, the pooled effect indicated that MBCT is potentially associated with reductions in depressive symptom scores versus other comparators, including waitlist or cognitive behavioral therapy (CBT) without mindfulness meditation (SMD $-1.07$, 95% CI $-2.21$, 0.08; $I^2$ 80%; 4 RCTs). A meta-regression indicated no statistically significant differences in the results between the monotherapy ($p=0.49$) and unclear ($p=0.26$) studies compared with adjunctive MBCT studies. Results from another meta-regression showed that unclear studies were possibly different from monotherapy studies ($p=0.06$). Thus, the unclear studies were included in the analyses with adjunctive MBCT studies.

KQ 1a: Among Publications That Address Monotherapy Meditation as a Treatment for Adults with MDD, How Common and Severe Are Adverse Events?

Only two studies explicitly assessed MBCT as monotherapy (one reporting on depressive symptoms, one on relapse). One of the two reported that no adverse events occurred during the trial (Britton et al., 2010), but it did not report whether there was systematic monitoring for adverse events or which events were assessed.
KQ 1b: Does the Efficacy Differ Depending on the Type of Monotherapy Meditation Used (e.g., MBCT, mindfulness-based stress reduction, yoga, tai chi)?

The only identified explicit monotherapy study followed the standard MBCT program. The study reported on meditation practice and reported no correlation between depression scale scores and mindfulness meditation practice outside of class (Britton et al., 2010).

KQ 2: Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Depressive Symptoms in Adults with MDD?

Participants in seven studies had a clinical diagnosis of MDD, were experiencing a depressive episode, or had residual symptoms when they enrolled in the study, which we refer to as active depression (Barnhofer et al., 2009; Batink et al., 2013; Chiesa, Mandelli, and Serretti, 2012; Geschwind et al., 2012; Manicavasgar, Parker and Perich, 2011; Omidi et al., 2013; Shahar et al., 2010; van Aalderen et al., 2012). Studies compared MBCT with waitlist, TAU alone, psycho-education, or CBT without mindfulness meditation. The pooled analysis across these studies showed significantly greater improvement for MBCT than comparators (SMD −0.77; 95% CI −1.21, −0.34; I² 63%; 7 RCTs). There was substantial heterogeneity in study results (see Figure 3.2).

The effect estimate was similar when excluding two studies (Manicavasgar, Parker, and Perich, 2011; Shahar et al., 2010) that did not report a systematic co-intervention or that explicitly referred to ongoing TAU (SMD −0.83; 95% CI −1.38, −0.27; I² 61%; 5 RCTs).

One of the studies with participants who had a clinical diagnosis of MDD, were experiencing a depressive episode, or had residual symptoms when they enrolled in the study also examined response to treatment (i.e., at least a 50-percent reduction in depressive symptom score on a standardized scale) (Barnhofer et al., 2009). Participants were assigned to either MBCT and TAU or TAU alone. The response rate was not statistically significantly different between the MBCT group and TAU alone (RR 0.18; 95% CI 0.02, 1.31).
We identified 12 RCTs in total that examined the effect of adjunctive MBCT on depressive symptom scores (Barnhofer et al., 2009; Batink et al., 2013; Chiesa, Mandelli, and Serretti, 2012; Forkmann et al., 2014; Godfrin and van Heeringen, 2010; Jermann et al., 2013; Keune et al., 2011; Kuyken, Byford, et al., 2008; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; Shahar et al., 2010; van Aalderen et al., 2012). Studies included patients with current MDD or patients with a history of MDD but currently in remission. The primary treatment was TAU in seven studies (Barnhofer et al., 2009; Batink et al., 2013; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; van Aalderen et al., 2012), TAU without antidepressants in one study (Bondolfi et al., 2010), and antidepressants in four studies (Chiesa, Mandelli, and Serretti, 2012; Keune et al., 2011; Kuyken, Byford, et al., 2008; Shahar et al., 2010). The most common comparator was TAU (seven studies) (Barnhofer et al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Omidi et al., 2013; van Aalderen et al., 2012). The comparator for three studies was antidepressants either alone (Kuyken, Byford, et al., 2008), with waitlist (Keune et al., 2011), or with psycho-education (Chiesa, Mandelli, and Serretti, 2012).
Two studies included CBT comparators (Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013).

The pooled analysis across the 12 studies indicated statistically significantly greater improvement in the MBCT group than for the comparator interventions (SMD $-0.72$; 95% CI $-1.14$, $-0.30$; $I^2$ 85%; 12 RCTs) (see Figure 3.3). However, there was substantial heterogeneity.

We found no evidence of publication bias for relapse (Egger’s test: $p=0.80$; Begg’s test: $p=1.00$).

**Figure 3.3. Efficacy of Adjunctive MBCT on Depressive Symptoms in MDD and Prior MDD**

![Graph showing efficacy of Adjunctive MBCT on Depressive Symptoms in MDD and Prior MDD]

<table>
<thead>
<tr>
<th>Author Year</th>
<th>SMD [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barnhofer 2009</td>
<td>-0.92 [-1.66, -0.17]</td>
</tr>
<tr>
<td>Batink 2013</td>
<td>-0.60 [-0.95, -0.24]</td>
</tr>
<tr>
<td>Chiesa 2012</td>
<td>-0.81 [-1.83, 0.22]</td>
</tr>
<tr>
<td>Godfrin 2010</td>
<td>-0.98 [-1.39, -0.58]</td>
</tr>
<tr>
<td>Hepburn 2009</td>
<td>-0.30 [-0.91, 0.30]</td>
</tr>
<tr>
<td>Jermann 2013</td>
<td>0.49 [-0.17, 1.15]</td>
</tr>
<tr>
<td>Keune 2011</td>
<td>-1.85 [-2.38, -1.31]</td>
</tr>
<tr>
<td>Kuyken 2008</td>
<td>-0.15 [-0.50, 0.21]</td>
</tr>
<tr>
<td>Manicavasgar 2011</td>
<td>-0.15 [-0.74, 0.44]</td>
</tr>
<tr>
<td>Omidi 2013</td>
<td>-1.14 [-2.11, -0.51]</td>
</tr>
<tr>
<td>Shahar 2010</td>
<td>-1.14 [-2.11, -0.51]</td>
</tr>
<tr>
<td>Van Aalderen 2012</td>
<td>-0.47 [-0.75, -0.20]</td>
</tr>
</tbody>
</table>

RE Model

I-squared=84.6%

-0.70 [-1.10, -0.29]

Total N = 917

Of note, the effect of adjunctive MBCT was less consistent among the five studies focused on those participants with a history of MDD who were not currently experiencing residual depressive symptoms. The primary treatment was TAU in three studies (Barnhofer et al., 2009; Batink et al., 2013; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013; van Aalderen et al., 2012) and antidepressants in two studies (Chiesa, Mandelli, and Serretti, 2012; Keune et al., 2011; Kuyken, Byford, et al., 2008; Shahar et al., 2010). The most common comparator was TAU (three studies) (Barnhofer et
al., 2009; Batink et al., 2013; Bondolfi et al., 2010; Geschwind et al., 2012; Godfrin and van Heeringen, 2010; Omidi et al., 2013; van Aalderen et al., 2012). The comparator for two studies was antidepressants either alone (Kuyken, Byford, et al., 2008) or with waitlist (Keune et al., 2011). Pooled across all studies, there was no statistically significant differences between MBCT and comparator interventions among studies whose participants had a history of depression but were not currently depressed (SMD $-0.57$; 95% CI $-1.67$, $0.53$; $I^2$ 92%; 5 RCTs), and there was substantial heterogeneity across studies.

**MBCT Plus TAU Versus TAU**

Five studies of mixed quality with 471 enrolled participants with current MDD or residual depressive symptoms reported a comparison of MBCT plus TAU and TAU alone. All studies showed significantly greater improvement among those receiving MBCT (Barnhofer et al., 2009; Forkmann et al., 2014; Omidi et al., 2013; Shahar et al., 2010; van Aalderen et al., 2012). The pooled effect showed MBCT plus TAU to be statistically significantly superior to TAU alone in reducing depressive symptoms (SMD $-0.92$; 95% CI $-1.57$, $-0.27$; $I^2$ 80%; 5 RCTs). However, there was substantial heterogeneity across studies, see Figure 3.4.
MBCT Plus Antidepressants Versus Antidepressants Alone

One fair quality study with 123 enrolled participants compared adjunctive MBCT plus tapered maintenance antidepressants with antidepressants alone (Kuyken, Byford, et al., 2008) in a sample of individuals who had experienced three or more previous depressive episodes. The tapering of antidepressants started in week four or five of the eight-week MBCT intervention. There were no statistically significant differences in the change in residual depressive symptoms between the MBCT plus antidepressant group and the antidepressant alone group a month after the intervention using the HRSD (SMD −0.30; 95% CI −0.66, 0.05), and there were marginal difference using the BDI (SMD −0.36; 95% CI −0.72, 0.00) in ITT analyses. There also were not statistically significant differences at 15 months after baseline in either the HRSD (SMD −0.23; 95% CI −0.58, 0.13) or BDI (SMD −0.33; 95% CI −0.69, 0.03).
Two poor quality studies with 159 enrolled participants compared adjunctive MBCT to adjunctive CBT (Manicavasgar, Parker, and Perich, 2011; Omidi et al., 2013). Among currently depressed patients, both MBCT and CBT were associated with significant improvements in depressive symptoms over the eight-week study period, with no differences in improvement between the two groups in one study (Manicavasgar, Parker, and Perich, 2011); there were also no statistically significant differences between MBCT and CBT at the six-month and 12-month follow-ups. In a sample of currently depressed individuals that were randomized to MBCT, TAU, or CBT, Omidi et al. (2013) also reported no statistically significant difference in improvement in depressive symptom scores between the MBCT and CBT groups. The pooled result was an SMD of $-0.06$ (95% CI $-1.01$, $0.89$; $I^2$ $0\%$; 2 RCTs), indicating that mindfulness meditation did not statistically significantly improve depression scores compared with traditional CBT.

A single fair quality study with 18 enrolled participants with major depression who did not achieve remission following at least eight weeks of antidepressant treatment compared MBCT with a psycho-education intervention that focused on the criteria for MDD and underlying cognitive dysfunctions, as well as with pharmacologic and psychological treatments for MDD (Chiesa, Mandelli, and Serretti, 2012). There was no statistically significant difference in HRSD scores at the end of the intervention compared with the psycho-education intervention (SMD $-0.81$; 95% CI $-1.83$, $0.22$).

Five MBCT RCTs of mixed quality addressed adverse events (Barnhofer et al., 2009; Geschwind et al., 2012; Kuyken, Byford, et al., 2008; Shahar et al., 2010; Williams, Crane, et al., 2014). Three studies reported that no adverse events occurred (Geschwind et al., 2012; Kuyken, Byford, et al., 2008; Shahar et al., 2010). One study reported that none of the adverse events was deemed to be related to the treatment, but one participant in the MBCT group contacted the therapist during a suicidal crisis and after crisis intervention was referred to his or her psychiatrist (Barnhofer et al., 2009). One MBCT study (Williams, Crane, et al., 2014) reported that 15 serious adverse events occurred, only one of which was thought to be related to the study interventions (the event occurred in the cognitive psychological education [CPE] arm). None of the studies stated whether the occurrence of adverse events was systematically assessed.
KQ 2b: Does the Efficacy Differ Depending on the Type of Adjunctive Meditation Used?

There was insufficient evidence to answer this question. A meta-regression analyzing differences between studies that followed the original MBCT manual and studies that used a modified MBCT intervention indicated that deviations were not significantly associated with MBCT results (p=0.70).

One study of patients with a history of at least three previous depressive episodes, some of whom were experiencing depression at the time of the study, found a weak correlation between the amount of formal meditation practiced outside the class and change in depressive symptom score during MBCT (r=0.26, p<.05).

KQ 3: Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Decreasing Relapse Rates in Adults with MDD?

One fair quality study with 84 participants compared the effect on relapse rates at 18 months following treatment of MBCT with two control groups: (1) antidepressants and (2) placebo plus clinical management in a sample of participants in remission with a history of at least three previous episodes of depression (Segal et al., 2010). The intervention consisted of eight weekly sessions, as well as an all-day retreat. In addition, participants had daily homework exercises. Overall, there were no statistically significant differences in relapse rates between either MBCT and antidepressants (RR 0.80; 95% CI 0.39, 1.62) or between monotherapy MBCT and antidepressant placebo plus clinical management (RR 0.65; 95% CI 0.34, 1.62). Among those in stable remission, there were no statistically significant differences in relapse rates between either MBCT and antidepressants (RR 1.25; 95% CI 0.60, 2.59) or between monotherapy MBCT and antidepressant placebo plus clinical management (RR 1.06; 95% CI 0.54, 2.07). Among those in unstable remission, MBCT was associated with statistically significantly lower relapse rate compared with antidepressant placebo plus clinical management (RR 0.39; 95% CI 0.17, 0.88), but not compared with antidepressants (RR 1.02; 95% CI 0.30, 3.45). There were not enough studies to test for publication bias.

KQ 3a: Does the Efficacy Differ Depending on the Type of Monotherapy Meditation Used?

The monotherapy study that reported on depression relapse followed the standard MBCT protocol and did not report on associations between meditation characteristics (e.g., frequency outside of class) and the occurrence of relapse. Hence, there is insufficient evidence to address this question.
**KQ 4: Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Decreasing Relapse Rates in Adults with MDD?**

We did not identify any study that randomized patients with MDD to an MBCT intervention and reported on long-term follow-up to assess later relapse after initial treatment response.

We identified six RCTs that addressed MBCT as an adjunct treatment for patients with a history of MDD that included an assessment of relapse (Bondolfi et al., 2010; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008; Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000; Williams, Crane, et al., 2014). The studies enrolled 651 participants with a history of multiple previous depressive episodes. These studies were mostly good or fair quality. Two of the studies required at least two previous depressive episodes (Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000), while four required at least three previous depressive episodes (Bondolfi et al., 2010; Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008; Williams, Crane, et al., 2014) to be included in the trial. Four of the studies provided MBCT adjunctive to TAU, and the comparator was TAU. In the fifth study, MBCT was adjunctive to TAU and compared with two groups: TAU alone or CPE. The sixth study was adjunctive to and compared with maintenance antidepressants (Kuyken, Byford, et al., 2008). The pooled estimate showed a statistically significant reduction of relapse rate for MBCT compared with control (RR 0.72; 95% CI 0.56, 0.93; I² 25%; 6 RCTs) (see Figure 3.5). We found no evidence of publication bias for relapse (Egger’s test: p=0.55; Begg’s test: p=0.27).
The pooled estimate for the five studies that compared MBCT plus TAU with TAU showed a statistically significant reduction of relapse rate for MBCT (RR 0.70; 95% CI 0.50, 0.98; I² 39%; 5 RCTs) (see Figure 3.6).
Several studies indicated that treatment effects were stronger among patients with at least three prior episodes of depression in at least partial recovery. In one study, significantly fewer patients receiving MBCT plus TAU showed relapse compared with patients receiving TAU alone (RR 0.45; 95% CI 0.29, 0.70), and the mean time to first relapse was longer (39.5 weeks versus 53.7; p<0.001) (Godfrin and van Heeringen, 2010). Similarly, another study demonstrated a reduction in the risk of relapse among participants receiving MBCT plus TAU compared with TAU alone (RR 0.61; 95% CI 0.41, 0.89) (Teasdale, Segal, et al., 2000). Two studies found no statistically significant differences in relapse rates among recurrently depressed patients receiving MBCT plus TAU compared with either TAU alone (RR 0.88; 95% CI 0.63, 1.22) (Williams, Crane, et al., 2014), maintenance medication (RR 0.80; 95% CI 0.57, 1.11) (Kuyken, Byford, et al., 2008), or CPE (RR 0.93; 95% CI 0.70, 1.24) (Williams, Crane, et al., 2014). One study showed no statistically significant differences in relapse rates among patients receiving MBCT plus TAU compared with TAU alone (RR 0.84; 95% CI 0.40, 1.77), but it did find a significant reduction in the time to relapse in the intervention group compared with TAU alone.
(204 days versus 68 days; p=0.006) (Bondolfi et al., 2010). The pooled estimate for subgroups of participants with at least three or more previous depressive episodes had an RR of 0.66 (95% CI 0.48, 0.90; I² 47%; 6 RCTs). In contrast, two studies found that adjunctive MBCT did not reduce risk of relapse among patients with two prior episodes of depression (Ma and Teasdale, 2004; RR 2.50; 95% CI 0.60, 10.34) (Teasdale, Segal, et al., 2000; RR 1.80; 95% CI 0.77, 4.19). The pooled estimate for the subgroup of participants with two previous episodes had an RR of 1.96 (95% CI 0.31, 12.29; I² 0%; 2 RCTs). A meta-regression indicated that the number of depressive episodes is potentially associated with the treatment success, but the results were not statistically significant (p=0.07).

KQ 4a: Does the Efficacy Differ Depending on the Type of Adjunctive Meditation Used?

There was insufficient evidence to answer this question. A meta-regression analyzing differences between studies that followed the original MBCT manual versus studies that used a modified MBCT intervention indicated that deviations were not significantly associated with relapse (p=0.33). Two studies reported an analysis of the effect of meditation characteristics on relapse rates. One study examined the relationship between maintenance of regular practice during the intervention, the six months following the intervention, and six to 12 months after the intervention by patients who had experienced at least three previous depressive episodes but were in remission at the time of the study and relapse. The amount of sitting meditation, three-minute breathing space, and informal space did not differ during any time period for those who did and did not relapse. Individuals who relapsed were engaged in significantly more body scan practice six to 12 months after completing MBCT (Bondolfi et al., 2010).

One study explored whether depression relapse among patients with recurrent depression was associated with an MBCT instructor, a clinical psychologist, and an occupational therapist. Both instructors had participated in a training program and run pilot MBCT groups with supervision. An independent MBCT therapist reviewed videotapes of the MBCT sessions and confirmed the competency of both instructors. There was no significant difference in relapse rates across the therapists or the groups they led (Kuyken, Byford, et al., 2008).

KQ 5: Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments In Improving Health-Related Quality of Life in Adults with MDD?

We did not identify any study that assessed whether monotherapy MBCT was associated with improved health-related quality of life among adults with MDD.
**KQ 6: Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Improving Health-Related Quality of Life in Adults with MDD?**

Five studies assessed whether adjunctive MBCT was associated with improved health-related quality of life among adults with MDD. Three of the studies included individuals experiencing a depressive episode or residual depressive symptoms (Chiesa, Mandelli, and Serretti, 2012; Manicavasgar, Parker, and Perich, 2011; van Aalderen et al., 2012), while two focused on individuals with a history of depression who were not experiencing residual symptoms (Godfrin and van Heeringen, 2010; Kuyken, Byford, et al., 2008). The pooled estimate showed no significant differences in quality of life in the MBCT groups compared with control (SMD −0.42; 95% CI −0.70, −0.14; I² 71%; 5 RCTs) (see Figure 3.7).

**Figure 3.7. Adjunctive MBCT and Health-Related Quality of Life**

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>SMD [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiesa 2012</td>
<td></td>
<td>-0.81 [-1.84, 0.22]</td>
</tr>
<tr>
<td>Godfrin 2010</td>
<td></td>
<td>-1.02 [-1.42, -0.61]</td>
</tr>
<tr>
<td>Kuyken 2008</td>
<td></td>
<td>-0.16 [-0.51, 0.19]</td>
</tr>
<tr>
<td>Manicavasgar 2011</td>
<td></td>
<td>-0.04 [-0.63, 0.56]</td>
</tr>
<tr>
<td>Van Aalderen 2012</td>
<td></td>
<td>-0.42 [-0.70, -0.14]</td>
</tr>
<tr>
<td>RE Model</td>
<td></td>
<td>-0.46 [-0.97, 0.05]</td>
</tr>
</tbody>
</table>

I-squared=70.6%

Total N = 495
MBCT Plus TAU Versus TAU Alone

Two studies (one fair and one poor quality) with 325 enrolled participants compared MBCT with TAU on quality-of-life measures. In a study comparing MBCT with TAU among recurrently depressed (defined as at least three prior episodes) patients, MBCT was associated with better scores on the World Health Organization (WHO) Quality of Life psychological subscale compared with TAU (SMD $-0.38$; 95% CI $-0.66$, $-0.11$), but not the physical (SMD $-0.42$; 95% CI $-0.70$, $-0.14$) or social (SMD $-0.09$; 95% CI $-0.36$, $0.18$) subscales. In a subgroup of patients who were currently depressed (n=69), scores also favored MBCT compared with TAU on the psychological subscale (SMD $-0.49$; 95% CI $-0.77$, $-0.21$), but not on the physical (SMD $-0.17$; 95% CI $-0.44$, $0.11$) or social (SMD $0.26$; 95% CI $-0.53$, $0.02$) subscales (van Aalderen et al., 2012). In a second study among currently remitted patients with at least three prior depressive episodes, MBCT was associated with better health-related quality of life as measured by the Quality of Life in Depression Scale compared with TAU at 8 weeks (SMD $-1.02$; 95% CI $-1.42$, $-0.61$), 8 months (SMD $-0.67$; 95% CI $-1.06$, $-0.28$) and 14 months (SMD $-0.68$; 95% CI $-1.07$, $-0.29$) after baseline (Godfrin and van Heeringen, 2010).

MBCT Plus Maintenance Antidepressants Versus Maintenance Antidepressants Alone

One fair quality study of MBCT versus maintenance antidepressants with 123 enrolled participants compared health-related quality of life for currently remitted patients with at least three prior depressive episodes (Kuyken, Byford, et al., 2008). There were not significant differences in quality of life at one month post-treatment between MBCT and maintenance antidepressants in the physical (SMD $-0.10$; 95% CI $-0.46$, $0.25$), psychological (SMD $-0.16$; 95% CI $-0.51$, $0.19$), or social (SMD $-0.21$; 95% CI $-0.56$, $0.15$) domains of the WHO Quality of Life scale (Kuyken, Byford, et al., 2008).

MBCT Plus Antidepressants Versus Psycho-Education Plus Antidepressants

In a fair quality study of 18 patients with major depression who did not achieve remission following at least eight weeks of antidepressant treatment, there was not a significant difference in health-related quality of life measured by the Psychological General Well-Being Index in the MBCT group compared with a psycho-education control group (SMD $-0.81$; 95% CI $-1.84$, $-0.22$) (Chiesa, Mandelli, and Serretti, 2012).

MBCT Plus Antidepressants Versus CBT Plus Antidepressants

One poor quality study with 69 currently depressed patients compared changes in health-related quality of life as measured by the Social and Occupational Functioning Scale (SOFAS) in a group receiving MBCT with changes in a group receiving CBT (Manicavasgar, Parker, and Perich, 2011). There was no significant difference in health-related quality of life between groups (SMD $0.04$; 95% CI $-0.63$, $0.56$).
KQ 7: Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Antidepressant Use in Adults with MDD?

None of the monotherapy studies examined the effect of interventions on the use of antidepressants.

KQ 8: Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Antidepressant Use in Adults with MDD?

We identified six studies of good and fair quality that examined the impact of adjunctive MBCT on antidepressant use. Five studies found no significant differences in reductions, changes, or reinstatement of antidepressant use over time or between groups (Barnhofer et al., 2009; Bondolfi et al., 2010; Godfrin and van Heeringen, 2010; Ma and Teasdale, 2004; Teasdale, Segal, et al., 2000), while one study found that the cost of antidepressants was significantly lower in the MBCT group (Kuyken, Byford, et al., 2008). In one study among patients who had a history of recurrent depression, had a history of treatment by a recognized antidepressant, were currently off antidepressant medication, and were in at least partial remission, there were no significant differences in the proportion of patients using antidepressants at any time over the 52-week follow-up period between the MBCT plus TAU group compared with the TAU alone group (40 percent versus 45 percent, p=0.10) (Teasdale, Segal, et al., 2000). In a similar patient sample, another study found no difference between adjunctive MBCT and TAU alone in the use or dosage of antidepressants over a 60-week study period (Ma and Teasdale, 2004). Another study of adjunctive MBCT among patients with a history of at least three prior depressive episodes currently in at least partial remission (as defined by the study) (Godfrin and van Heeringen, 2010) similarly found no significant differences in antidepressant medication use over a 14-month follow-up period between patients receiving MBCT plus TAU (baseline: 73 percent; 14-month follow-up: 64 percent) compared with TAU alone (baseline: 61 percent; 14-month follow-up: 62 percent). A study of individuals who were in remission, had a history of recurrent major depression, and had at least two depressive episodes in the past five years found no difference in antidepressant reinstatement during the study between MBCT plus TAU (36 percent) and TAU alone (31 percent). The pooled estimate showed no significant differences in antidepressant use in the MBCT groups compared with control (RR =0.01; 95% CI =0.34, 0.32; I² 18%; 4 RCTs). A fifth study of patients with current MDD or residual symptoms following an MDD episode found differences that approached statistical significance in the percentage of participants with changes in their antidepressant use during the study period (14 percent in MBCT plus TAU versus 50 percent in TAU alone group, p=0.052) (Barnhofer et al., 2009).
The sixth study included participants with a history of three or more episodes of depression on maintenance antidepressants. Over a 15-month follow-up period, this study found that the cost of antidepressants was $103 less (95% CI $191 to $14) in the MBCT group than the maintenance antidepressant group (Kuyken, Byford, et al., 2008).
Chapter Four: Discussion

Summary of Findings

The evidence on the efficacy of MBCT for MDD has expanded in recent years. We identified 17 relevant studies investigating MBCT for preventing relapse and reducing depression symptoms. Data on quality of life remains sparse, and adverse events have not been systematically assessed.

**KQ 1: Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Depressive Symptoms in Adults with MDD?**

We did not identify any study in patients with a current diagnosis of MDD that reported on the effectiveness of MBCT given as monotherapy. We identified one study in patients in full or partial remission that explicitly assessed MBCT as monotherapy and reported on depressive symptoms. There was very low quality evidence that MBCT reduces depressive symptoms more than waitlist control (SMD $-1.11$; 95% CI $-2.07$, $-0.15$; 1 RCT).

**KQ 1a: Among Publications That Address Monotherapy Meditation as a Treatment for Adults with MDD, How Common and Severe Are Adverse Events?**

Only two studies explicitly assessed MBCT as monotherapy (one reporting on depressive symptoms, one on relapse). One of the two addressed adverse events and reported that no adverse events occurred during the trial (Britton et al., 2010), but did not report whether there was systematic monitoring for adverse events.

**KQ 1b: Does the Efficacy Differ Depending on the Type of Meditation Used (e.g., MBCT, mindfulness-based stress reduction, yoga, tai chi)?**

The only identified monotherapy study followed the standard MBCT program. The study reported on meditation practice and reported no correlation between depression scale scores and mindfulness meditation practice outside of class.

**KQ 2: Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Depressive Symptoms in Adults with MDD?**

There was moderate quality evidence of MBCT reducing depressive symptoms in patients with MDD compared with all comparators (SMD $-0.77$; 95% CI $-1.21$, $-0.34$; $I^2$ 63%; 7 RCTs).
Twelve RCTs examined adjunctive MBCT on depressive symptom scores. There was moderate evidence in support of using adjunctive MBCT over all interventions (SMD $-0.72$; 95% CI $-1.14$, $-0.30$; I$^2$ 85%; 12 RCTs). There was moderate evidence of its efficacy compared with TAU (SMD $-0.92$; 95% CI $-1.57$, $-0.27$; I$^2$ 80%; 5 RCTs). The evidence suggested that MBCT had no significant effect on residual depressive symptom scores among those with a history of depression but not currently depressed (SMD $-0.57$; 95% CI $-1.67$, 0.53; I$^2$ 92%; 5 RCTs).

KQ 2a: Among Publications That Address Adjunctive Meditation as a Treatment for Adults with MDD, How Common and Severe Are Adverse Events?

Five MBCT studies reported on adverse events, and three stated that no adverse events occurred. One study reported that none of the adverse events was deemed to be related to the treatment, but one participant in the MBCT group contacted the therapist during a suicidal crisis and, after crisis intervention, was referred to his or her psychiatrist. The fifth study reported that 15 serious adverse events occurred, only one of which was thought to be related to the study interventions (the event occurred in the CBT arm). None of the studies stated whether the occurrence of adverse events was systematically assessed. The lack of systematic assessment of adverse events and the small sample size of individual studies reduces the ability to draw conclusions, however, because rare adverse events are unlikely to be reported.

KQ 2b: Does the Efficacy Differ Depending on the Type of Meditation Used?

There was insufficient evidence to answer this question. A meta-regression analyzing differences between studies that followed the original MBCT manual versus studies that used a modified MBCT intervention indicated that deviations were not significantly associated with MBCT results. One study showed that relapse rates did not differ between therapists of different backgrounds who were trained in MBCT and determined to be competent instructors.

In individuals with recurrent depression, one study found a weak correlation between the amount of formal meditation practiced outside the class and a change in depressive symptom score during MBCT. Another study of individuals with recurrent depression found that relapse rates were higher among individuals with more body scan practice six to 12 months after MBCT, but found no associations with other forms of practice.

KQ 3: Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Decreasing Relapse Rates in Adults with MDD?

One fair quality study with 84 participants compared the effect on relapse rates at 18 months following treatment of MBCT with two control groups: (1) antidepressants and (2) placebo plus clinical management in a sample of participants in remission with a history of at least three previous episodes of depression. Overall, there were no significant differences in relapse rates.
between either MBCT plus antidepressants (RR 0.80; 95% CI 0.39, 1.62) or monotherapy
MBCT and placebo plus clinical management (RR 0.65; 95% CI 0.34, 1.62). Among those in
stable remission, there were no significant differences in relapse rates between either MBCT plus
antidepressants (RR 1.25; 95% CI 0.60, 2.59) or monotherapy MBCT and placebo plus clinical
management (RR 1.06; 95% CI 0.54, 2.07). Among those in unstable remission, MBCT was
associated with lower relapse rates compared with placebo plus clinical management (RR 0.39;
95% CI 0.17, 0.88), but not compared with antidepressants (RR 1.02; 95% CI 0.30, 3.45).

**KQ 3a: Does the Efficacy Differ Depending on the Type of Meditation Used?**

The monotherapy study that reported on depression relapse followed the standard MBCT
protocol and did not report on associations between meditation characteristics (e.g., frequency
outside of class) and the occurrence of relapse. Hence, there is insufficient evidence to address
this question.

**KQ 4: Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No
Treatment, or Other Active Treatments in Decreasing Relapse Rates in Adults with
MDD?**

We did not identify any study that reported on patients with MDD at the time of enrollment
who were randomized to MBCT and that reported on long-term follow-up to assess later relapse
after initial treatment response. We identified six RCTs that addressed MBCT as an adjunct
treatment and that included an assessment of relapse. There was moderate quality evidence that
adjunctive MBCT reduces relapse rates compared with all controls (RR 0.72; 95% CI 0.56, 0.93;
I² 25%; 6 RCTs) and compared with TAU (RR 0.70; 95% CI 0.50, 0.98; I² 39%; 5 RCTs). Only
one study compared relapse rates of MBCT with those of maintenance medication (RR 0.80;
95% CI 0.57, 1.11) or CPE (RR 0.93; 95% CI 0.70, 1.24). Among patients with at least three
prior episodes of depression in at least partial recovery, there was moderate evidence of the
impact of adjunctive MBCT on relapse rates (RR 0.66; 95% CI 0.48, 0.90; I² 47%; 6 RCTs).
However, the evidence does not support that MBCT reduces relapse rates among individuals
with one or two previous depressive episodes (RR 1.96; 95% CI 0.31, 12.29; I² 0%; 2 RCTs).

**KQ 4a: Does the Efficacy Differ Depending on the Type of Meditation Used?**

There was insufficient evidence to answer this question. A meta-regression analyzing
differences between studies that followed the original MBCT manual versus studies that used a
modified MBCT intervention indicated that deviations were not significantly associated with
MBCT results. A study of individuals with recurrent depression found that relapse rates were
higher among individuals with more body scan practice six to 12 months after MBCT, but found
no associations with other forms of practice. Another study of individuals with recurrent
depression found no difference in relapse rates among two trained MBCT instructors of different
backgrounds, a clinical psychologist, and an occupational therapist.
KQ 5: *Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Improving Health-Related Quality of Life Symptoms in Adults with MDD?*

We did not identify any study that assessed whether monotherapy MBCT was associated with improved health-related quality of life among adults with MDD.

KQ 6: *Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Improving Health-Related Quality of Life Symptoms in Adults with MDD?*

Five studies examined the effect of adjunctive MBCT on health-related quality of life; TAU was the only comparator used in more than one study. Overall, there was very low quality evidence of the effect of MBCT on health-related quality of life. The pooled estimate showed no significant differences in quality of life in the MBCT groups compared with control (SMD −0.42; 95% CI −0.70, −0.14; I² 71%; 5 RCTs).

KQ 7: *Is Meditation, as a Monotherapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Antidepressant Use in Adults with MDD?*

None of the monotherapy studies examined the effect of MBCT on the use of antidepressants.

KQ 8: *Is Meditation, as an Adjunctive Therapy, More Effective Than TAU, Waitlists, No Treatment, or Other Active Treatments in Reducing Antidepressant Use in Adults with MDD?*

We identified six studies of good and fair quality that examined the impact of adjunctive MBCT on antidepressant use. Four studies found no significant differences in use or reinstatement of antidepressants over time or between groups. The pooled estimate showed no statistically significant differences in antidepressant use in the MBCT groups compared with control (RR −0.01; 95% CI −0.34, 0.32; I² 18%; 4 RCTs). A fifth study found no statistically significant differences in changes in antidepressant use compared with TAU alone (14 percent in MBCT plus TAU group; 50 percent in TAU alone group). There is moderate evidence that MBCT does not affect antidepressant use. The sixth study found that the cost of antidepressants was $103 less (95% CI −$191 to −$14) in the MBCT group than the maintenance antidepressant group over a 15-month period.
<table>
<thead>
<tr>
<th>Outcome</th>
<th>Study Design (number of RCTs and participants)</th>
<th>Findings (direction and magnitude of effect)</th>
<th>Study Limitations (study quality; risk of bias)</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>GRADE of Evidence for Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ 1: Monotherapy meditation and depressive symptoms</td>
<td></td>
<td>Study showed greater reduction in depressive symptoms in MBCT compared with waitlist; SMD $-1.11$; 95% CI $-2.07$, $-0.15$</td>
<td>1 poor quality study ($-2$)</td>
<td>No replication ($-1$)</td>
<td>Direct</td>
<td>Precise</td>
<td>Very Low</td>
</tr>
<tr>
<td>Comparison: MBCT versus waitlist (Britton et al., 2010)</td>
<td>1 RCT; 26 enrolled, 20 completed</td>
<td>Study showed greater reduction in depressive symptoms in MBCT compared with waitlist; SMD $-1.11$; 95% CI $-2.07$, $-0.15$</td>
<td>1 poor quality study ($-2$)</td>
<td>No replication ($-1$)</td>
<td>Direct</td>
<td>Precise</td>
<td>Very Low</td>
</tr>
<tr>
<td>KQ 1a: Monotherapy meditation and adverse events</td>
<td></td>
<td>No adverse events occurred</td>
<td>No replication ($-2$); study size too small to detect rare events</td>
<td>No replication ($-1$)</td>
<td>Direct</td>
<td>Imprecise ($-1$)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT versus waitlist</td>
<td>1 RCT; 26 enrolled, 20 completed</td>
<td>No adverse events occurred</td>
<td>No replication ($-2$); study size too small to detect rare events</td>
<td>No replication ($-1$)</td>
<td>Direct</td>
<td>Imprecise ($-1$)</td>
<td>Very low</td>
</tr>
<tr>
<td>KQ 1b. Does the efficacy differ depending on the characteristics of monotherapy meditation used?</td>
<td></td>
<td>The study reported no correlation between depression scale scores and mindfulness meditation practice outside of class</td>
<td>1 poor quality study ($-2$)</td>
<td>No replication ($-1$)</td>
<td>Indirect</td>
<td>Unclear</td>
<td>Insufficient</td>
</tr>
<tr>
<td>Comparison: Amount of mindfulness meditation practice outside of MBCT class</td>
<td>1 RCT; 26 enrolled, 20 completed</td>
<td>The study reported no correlation between depression scale scores and mindfulness meditation practice outside of class</td>
<td>1 poor quality study ($-2$)</td>
<td>No replication ($-1$)</td>
<td>Indirect</td>
<td>Unclear</td>
<td>Insufficient</td>
</tr>
<tr>
<td>KQ 2: Adjunctive meditation and depressive symptoms</td>
<td></td>
<td>SMD $-0.80$; 95% CI $-1.29$, $-0.31$</td>
<td>Mixed quality</td>
<td>Mostly positive results, but substantial heterogeneity ($-1$)</td>
<td>Direct</td>
<td>Precise</td>
<td>Moderate</td>
</tr>
<tr>
<td>Comparison: MBCT versus all comparators, MDD</td>
<td>7 RCTs; 609 enrolled, 554 completed</td>
<td>SMD $-0.80$; 95% CI $-1.29$, $-0.31$</td>
<td>Mixed quality</td>
<td>Mostly positive results, but substantial heterogeneity ($-1$)</td>
<td>Direct</td>
<td>Precise</td>
<td>Moderate</td>
</tr>
<tr>
<td>Comparison: MBCT versus all comparators, current MDD and history of MDD</td>
<td>12 RCTs; 1,057 enrolled, 910 completed</td>
<td>SMD $-0.72$; 95% CI $-1.14$, $-0.30$</td>
<td>Mixed quality</td>
<td>Mostly consistent in direction, but substantial heterogeneity ($-1$)</td>
<td>Direct</td>
<td>Precise</td>
<td>Moderate</td>
</tr>
<tr>
<td>Comparison: MBCT versus all comparators, history of MDD</td>
<td>5 RCTs; 518 enrolled, 430 completed</td>
<td>SMD $-0.57$; 95% CI $-1.67$, $0.53$</td>
<td>Mixed, but mostly poor quality studies ($-1$)</td>
<td>Mostly consistent in direction, but substantial heterogeneity ($-1$)</td>
<td>Direct</td>
<td>Imprecise ($-1$)</td>
<td>Very low</td>
</tr>
<tr>
<td>Outcome</td>
<td>Study Design (number of RCTs and participants)</td>
<td>Findings (direction and magnitude of effect)</td>
<td>Study Limitations (study quality; risk of bias)</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>GRADE of Evidence for Outcome</td>
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<tr>
<td>Comparison: MBCT plus TAU versus TAU, MDD</td>
<td>5 RCTs; 522 enrolled, 493 completed</td>
<td>SMD = -0.92; 95% CI = -1.57, -0.27</td>
<td>Mixed, but mostly poor quality studies (-1)</td>
<td>Substantial heterogeneity (-1)</td>
<td>Direct</td>
<td>Precise</td>
<td>Low</td>
</tr>
<tr>
<td>Comparison: MBCT plus antidepressants versus antidepressants</td>
<td>1 RCT; 123 enrolled, 104 completed</td>
<td>SMD of HRSD not significant; SMD = -0.30; 95% CI = -0.66, 0.05</td>
<td>1 fair quality study (-1)</td>
<td>No replication (-1); Mixed results depending on measure of depression (HRSD significant; BDI not significant)</td>
<td>Direct</td>
<td>Imprecise (-1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT plus TAU versus CBT plus TAU</td>
<td>2 RCTs; 159 enrolled, 135 completed</td>
<td>No differences between groups in either study; Pooled SMD = -0.06; 95% CI = -1.01, 0.89</td>
<td>2 poor quality studies (-1)</td>
<td>Consistent</td>
<td>Direct</td>
<td>Imprecise (-1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT plus antidepressant versus psycho-education plus antidepressant</td>
<td>1 RCT; 18 enrolled, 16 completed</td>
<td>No difference between groups; SMD = -0.81; 95% CI = -1.83, 0.22</td>
<td>1 fair quality study (-1)</td>
<td>No replication (-1)</td>
<td>Direct</td>
<td>Imprecise (-1)</td>
<td>Very low</td>
</tr>
<tr>
<td>KQ 2a: Adjunctive meditation and adverse events</td>
<td></td>
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</tr>
<tr>
<td>Comparison: MBCT versus all comparators</td>
<td>5 RCTs; 610 enrolled, 581 completed</td>
<td>3 RCTs reported that no adverse events occurred. 1 RCT reported that none of the adverse events was related to the intervention. 1 RCT reported 15 adverse events, but only one in a comparator arm was potentially related to the study.</td>
<td>Mostly fair and poor quality studies (-1); studies do not state whether occurrences of adverse events were systematically assessed</td>
<td>Consistent</td>
<td>Direct</td>
<td>Imprecise; studies too small to detect rare events (-1)</td>
<td>Low</td>
</tr>
<tr>
<td>Outcome</td>
<td>Study Design (number of RCTs and participants)</td>
<td>Findings (direction and magnitude of effect)</td>
<td>Study Limitations (study quality; risk of bias)</td>
<td>Inconsistency</td>
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<tr>
<td><strong>KQ 2b: Does the efficacy differ depending on the type of adjunctive meditation used?</strong></td>
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<tr>
<td>Comparison: Interventions with deviations from MBCT manual versus no deviations</td>
<td>15 RCTs; 1,551 enrolled, 1,370 completed</td>
<td>A meta-regression did not indicate that manual deviations were associated with treatment results. One study found a weak correlation between the amount formal meditation practiced outside the class and change in depressive symptom scores. Another study found that relapse rates were higher among individuals with more body scan practice six to 12 months after MBCT, but found no associations with other forms of practice.</td>
<td>Not systematically assessed (−1)</td>
<td>Unclear (−1)</td>
<td>Indirect</td>
<td>Imprecise (−1)</td>
<td>Insufficient</td>
</tr>
<tr>
<td><strong>KQ 3: Monotherapy meditation and depression relapse</strong></td>
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<tr>
<td>Comparison: MBCT versus placebo plus clinical management</td>
<td>1 RCT; 56 enrolled, 56 completed</td>
<td>No significant differences between groups; RR 0.65; 95% CI 0.34, 1.62</td>
<td>1 fair quality study (−1)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT versus antidepressants</td>
<td>1 RCT; 54 enrolled, 54 completed</td>
<td>No significant differences between groups; RR 0.80; 95% CI 0.39, 1.62</td>
<td>1 fair quality study (−1)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td><strong>KQ 4: Adjunctive meditation and depression relapse</strong></td>
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<tr>
<td>Comparison: MBCT versus all comparators</td>
<td>6 RCTs; 783 enrolled, 695 completed</td>
<td>RR 0.72; 95% CI 0.56, 0.93</td>
<td>Mix of good, fair, and poor quality studies (−1)</td>
<td>Consistent</td>
<td>Direct</td>
<td>Precise</td>
<td>Moderate</td>
</tr>
<tr>
<td>Comparison: MBCT versus all TAU</td>
<td>5 RCTs; 550 enrolled, 488 completed</td>
<td>RR 0.70; 95% CI 0.50, 0.98</td>
<td>Mix of good, fair, and poor quality studies (−1)</td>
<td>Consistent</td>
<td>Direct</td>
<td>Precise</td>
<td>Moderate</td>
</tr>
<tr>
<td>Comparison: MBCT versus maintenance antidepressant</td>
<td>1 RCT; 123 enrolled, 104 completed</td>
<td>RR 0.80; 95% CI 0.57, 1.11</td>
<td>1 fair quality study (−1)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Precise</td>
<td>Low</td>
</tr>
<tr>
<td>Comparison: MBCT versus CPE</td>
<td>1 RCT; 218 enrolled, 202 completed</td>
<td>RR 0.93; 95% CI 0.70, 1.24</td>
<td>1 poor quality study (−2)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Precise</td>
<td>Very low</td>
</tr>
<tr>
<td>Outcome</td>
<td>Study Design (number of RCTs and participants)</td>
<td>Findings (direction and magnitude of effect)</td>
<td>Study Limitations (study quality; risk of bias)</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>GRADE of Evidence for Outcome</td>
</tr>
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<tr>
<td><strong>KQ 5: Monotherapy meditation and health-related quality of life</strong></td>
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<tr>
<td>MBCT versus all comparators</td>
<td>0 RCTs</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>No evidence</td>
</tr>
<tr>
<td><strong>KQ 6: Adjunctive meditation and health-related quality of life</strong></td>
<td></td>
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</tr>
<tr>
<td>Comparison: MBCT versus all comparators</td>
<td>5 RCTs; 535 enrolled, 446 completed</td>
<td>Mixed results: SMD −0.42; 95% CI −0.70, −0.14</td>
<td>Fair and poor quality studies (−1)</td>
<td>Inconsistent (−1)</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT versus TAU</td>
<td>2 RCTs; 325 enrolled, 281 completed</td>
<td>One study found MBCT associated with improved quality of life (SMD −1.02; 95% CI −1.42, −0.61). The other study found that MBCT was associated with better scores on the WHO Quality of Life psychological subscale compared with TAU (SMD −0.38; 95% CI −0.66, −0.11), but not the physical subscale (SMD −0.42; 95% CI −0.70, −0.14) or social subscale (SMD −0.09; 95% CI −0.36, 0.18).</td>
<td>1 poor and 1 fair quality study (−1)</td>
<td>Inconsistent (−1); Mixed results</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT versus psycho-education</td>
<td>1 RCT; 18 enrolled, 16 completed</td>
<td>Significantly larger improvements in health-related quality of life with MBCT; SMD −0.81; 95% CI −1.84, −0.22</td>
<td>1 fair quality study (−1)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT versus CBT</td>
<td>1 RCT; 69 enrolled, 45 completed</td>
<td>No significant differences between MBCT and CBT; SMD 0.04; 95% CI −0.63, 0.56</td>
<td>1 poor quality study (−2)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Outcome</td>
<td>Study Design (number of RCTs and participants)</td>
<td>Findings (direction and magnitude of effect)</td>
<td>Study Limitations (study quality; risk of bias)</td>
<td>Inconsistency</td>
<td>Indirectness</td>
<td>Imprecision</td>
<td>GRADE of Evidence for Outcome</td>
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<tr>
<td>Comparison: MBCT versus maintenance antidepressants</td>
<td>1 RCT; 123 enrolled, 104 completed</td>
<td>There were not significant differences in quality of life at 1 month post-treatment between MBCT and maintenance antidepressants in the physical (SMD −0.10; 95% CI −0.46, 0.25), psychological (SMD −0.16; 95% CI −0.51, 0.19), or social (SMD −0.21; 95% CI −0.56, 0.15) domains of the WHO Quality of Life scale.</td>
<td>1 fair quality study (−1)</td>
<td>No replication (−1)</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Very low</td>
</tr>
<tr>
<td>Comparison: MBCT versus all comparators</td>
<td>0 RCTs</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>No evidence</td>
</tr>
<tr>
<td>Comparison: MBCT versus TAU</td>
<td>5 RCTs; 417 enrolled, 364 completed</td>
<td>Four studies compared antidepressant use between an MBCT group and controls. There were no significant differences in use of antidepressants between MBCT and controls; RR −0.01; 95% CI −0.34, 0.32. One study compared antidepressant changes between MBCT plus TAU versus TAU (14 percent in MBCT plus TAU versus 50 percent in TAU group; p=0.052).</td>
<td>4 good and 1 fair quality studies</td>
<td>Consistent</td>
<td>Direct</td>
<td>Imprecise (−1)</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

NA = not applicable.
Other Reviews in This Area

Previous reviews of MBCT (Chiesa and Serretti, 2011; Coelho, Canter, and Ernst, 2007) included a smaller number of studies, which reflects the emerging evidence base related to MBCT. Coelho, Canter, and Ernst (2007) focused on whether MBCT could reduce depression relapse among individuals with three or more previous episodes of depression. The review by Chiesa and Serretti (2011) examined both relapse and depressive symptoms, but did not restrict the included studies to those focusing on an MDD sample. Consistent with our findings, both reviews concluded that MBCT in addition to usual care can reduce major depression relapse among those with at least three previous depressive episodes compared with usual care alone. Also consistent with our findings, Chiesa and Serretti (2011) concluded that adjunctive MBCT could reduce residual depressive symptoms in patients with MDD. We expanded on previous reviews by analyzing data separately for monotherapy and adjunctive MBCT, as well as by separately examining available information for those with active depression and those in remission.

Strengths and Limitations

This review has a number of strengths, including a comprehensive search of electronic databases, the use of two independent reviewers to perform study selection and data abstraction, and the assessment of risk of bias and quality of evidence to develop the review’s conclusions. Furthermore, we contacted investigators of recently completed registered trials to inquire about completed work that had not yet been published. In addition, this review systematically documents the available evidence on MBCT for MDD, the condition that is the focus of the VA/DoD clinical guidelines (Management of Major Depressive Disorder Working Group, 2008), rather than depressive disorders more broadly, and this review assesses the quality of evidence by specific outcomes. However, there are also some limitations worth noting. We did not request study authors to provide data beyond what was contained in publications or in-press manuscripts. Many of the articles had small samples and were of poor quality, largely due to lack of ITT analysis, poor follow-up, or baseline differences between study arms. Thus, the poor quality of the underlying studies limits the ability to draw strong conclusions about the effect of MBCT on depression.

Implications for Future Research and Practice

The existing evidence is primarily based on adjunctive therapy studies. The evidence on the use of monotherapy MBCT is insufficient to make conclusions about its efficacy, either to reduce depressive symptoms among those who are currently depressed or to reduce relapse among those with a history of depression. These are areas where additional studies are needed.
There is also insufficient evidence on the effect of MBCT on health-related quality of life. Few studies examined the effect of MBCT on measures of health-related quality of life, and there was a lack of consistency in comparators used and the measures of health-related quality of life included. In addition, there is a lack of standardized reporting of adverse events.

Future studies should improve on the weaknesses pervasive in the current body of work, including suboptimal participant retention and a lack of true ITT analyses. Further research examining the effect of MBCT on depression should include samples large enough to allow results to be stratified by disease severity, include measures of health-related quality of life, and systematically assess adverse events.
Appendix A: Search Strategy

Our search strategy for each database used the key words presented in Chapter Two. Here, we present our original search strategy specifications. In May 2015, we performed an updated search that focused on MBCT, and these search strategy specifications are also presented.

PubMed

Limits: English; Not: Editorial or Comment; through January 2015

(depress* OR depression[MeSH] OR “depressive disorder”[MeSH] OR “mood disorders”[MeSH] OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR (“mood” [Title/Abstract] AND “disturbance”[Title/Abstract]) OR “affective disorders” OR “affective disorder”)

AND

(Meditation OR “mental training” OR “open monitoring meditation” OR “mindfulness” OR “mindful” OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”)

OR

(“focused”[Title/abstract] AND “attention”[Title/Abstract] AND ("meditations”[Title/Abstract] OR “meditation”[Title/Abstract])) OR “compassion meditation” OR “loving kindness” OR metta OR tonlen OR “qigong” OR “Qi Gong”)

OR


OR

(“movement”[Title/Abstract] AND (“meditation”[Title/Abstract] OR “meditations”[Title/Abstract])) OR yoga OR “tai chi” OR “meditative movement” OR yoga[MeSH])

OR

(zazen OR (“one-pointed”[Title/Abstract] AND “meditation”[Title/Abstract]) OR “progressive muscle relaxation”)

47
Web of Science

Refined by: Languages=( ENGLISH ) AND [excluding] Document Types=( EDITORIAL MATERIAL OR LETTER OR NEWS ITEM OR BOOK REVIEW )

depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

AND

Meditation OR “mental training” OR “open monitoring meditation” OR mindfulness OR mindful OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”

OR

“focused attention meditations” OR “focused attention meditation” OR “compassion meditation” OR “compassion meditations” OR “loving kindness” OR metta OR tonlen OR qigong OR “Qi Gong”

OR

“automatic self-transcending meditations” OR “automatic self-transcending meditation” OR “Mantra meditations” OR “mantra meditation” OR “mantram repetition program” OR “transcendental meditation” OR “relaxation response training”

OR

“movement meditation” OR “movement meditations” OR yoga OR “tai chi” OR “meditative movement”

OR

zazen OR “one-pointed meditation” OR “progressive muscle relaxation”

Embase

English; not (‘conference abstract’/it OR ‘conference review’/it OR ‘editorial’/it OR ‘letter’/it OR ‘note’/it)

depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

AND

Meditation OR “mental training” OR “open monitoring meditation” OR mindfulness OR mindful OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”
OR
“focused attention meditations” OR “focused attention meditation” OR “compassion meditation” OR “compassion meditations” OR “loving kindness” OR metta OR tonlen OR qigong OR “Qi Gong”
OR
“automatic self-transcending meditations” OR “automatic self-transcending meditation” OR “Mantra meditations” OR “mantra meditation” OR “mantram repetition program” OR “transcendental meditation” OR “relaxation response training”
OR
“movement meditation” OR “movement meditations” OR yoga OR “tai chi” OR “meditative movement”
OR
zazen OR “one-pointed meditation” OR “progressive muscle relaxation”

CINAHL (Cumulative Index to Nursing and Allied Health Literature)

English; Academic Journals

depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder” AND

Meditation OR “mental training” OR “open monitoring meditation” OR mindfulness OR mindful OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”
OR
“focused attention meditations” OR “focused attention meditation” OR “compassion meditation” OR “compassion meditations” OR “loving kindness” OR metta OR tonlen OR qigong OR “Qi Gong”
OR
“automatic self-transcending meditations” OR “automatic self-transcending meditation” OR “Mantra meditations” OR “mantra meditation” OR “mantram repetition program” OR “transcendental meditation” OR “relaxation response training”
OR
“movement meditation” OR “movement meditations” OR yoga OR “tai chi” OR “meditative movement”
OR
zazen OR “one-pointed meditation” OR “progressive muscle relaxation”
PsycInfo

English; Peer Reviewed Journals

depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

AND

OM

Meditation OR “mental training” OR “open monitoring meditation” OR mindfulness OR mindful OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”

OR

“focused attention meditations” OR “focused attention meditation” OR “compassion meditation” OR “compassion meditations” OR “loving kindness” OR metta OR tonlen OR qigong OR “Qi Gong”

OR

“automatic self-transcending meditations” OR “automatic self-transcending meditation” OR “Mantra meditations” OR “mantra meditation” OR “mantram repetition program” OR “transcendental meditation” OR “relaxation response training”

OR

“movement meditation” OR “movement meditations” OR yoga OR “tai chi” OR “meditative movement”

OR

zazen OR “one-pointed meditation” OR “progressive muscle relaxation”

Cochrane Databases (CDSR, CENTRAL, DARE)

Abstract, Title, Keyword search

depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

AND

OM

Meditation OR “mental training” OR “open monitoring meditation” OR mindfulness OR mindful OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”
OR
“focused attention meditations” OR “focused attention meditation” OR “compassion meditation” OR “compassion meditations” OR “loving kindness” OR metta OR tonlen OR qigong OR “Qi Gong”

OR
“automatic self-transcending meditations” OR “automatic self-transcending meditation” OR “Mantra meditations” OR “mantra meditation” OR “mantram repetition program” OR “transcendental meditation” OR “relaxation response training”

OR
“movement meditation” OR “movement meditations” OR yoga OR “tai chi” OR “meditative movement”

OR
zazen OR “one-pointed meditation” OR “progressive muscle relaxation”

PILOTS (Published International Literature on Traumatic Stress)

depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

AND

Meditation OR “mental training” OR “open monitoring meditation” OR mindfulness OR mindful OR “mindfulness-based stress reduction” OR Zen OR Vipassana OR Sahaja OR “Mindfulness-based cognitive therapy” OR “mindfulness based relapse prevention” OR “mindful attention”

OR
“focused attention meditations” OR “focused attention meditation” OR “compassion meditation” OR “compassion meditations” OR “loving kindness” OR metta OR tonlen OR qigong OR “Qi Gong”

OR
“automatic self-transcending meditations” OR “automatic self-transcending meditation” OR “Mantra meditations” OR “mantra meditation” OR “mantram repetition program” OR “transcendental meditation” OR “relaxation response training”

OR
“movement meditation” OR “movement meditations” OR yoga OR “tai chi” OR “meditative movement”

OR
zazen OR “one-pointed meditation” OR “progressive muscle relaxation”
Updated Search Focusing on Mindfulness-Based Cognitive Therapy

Update 15 May 2015

PubMed

Filters: Randomized Controlled Trial; Publication date from 2006/01/01 to 2014/12/31; English

“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
(depress* OR depression[MeSH] OR “depressive disorder”[MeSH] OR “mood disorders”[MeSH] OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR (“mood” [Title/Abstract] AND “disturbance”[Title/Abstract]) OR “affective disorders” OR “affective disorder”)

Results: 84; duplicates=0

Web of Science


“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

Results: 458; duplicates = 41
Embase

[english]/lim AND [embase]/lim AND [2006-2014]/py
“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

Results: 219; duplicates = 5

CINAHL (Cumulative Index to Nursing and Allied Health Literature)

Date of Publication: 20060101-20141231; Exclude MEDLINE records; Language: English

“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

Results: 12; duplicates = 0

PsycInfo

Limiters - Date of Publication: 20060101-20141231; Publication Type: Peer Reviewed Journal; Language: English
“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

Results: 200; duplicates = 4
Cochrane Databases (CDSR, CENTRAL, DARE)

Publication Year from 2006 to 2014

“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

Results: 139; duplicates = 6
(CDSR: 2; DARE: 8; CENTRAL: 127)

PILOTS (Published International Literature on Traumatic Stress)

Limits: 2006-2014

“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy
AND
depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”

Results: 11; duplicates = 1

ClinicalTrials.gov

(“mbct” OR “m-bct” OR “mindfulness based cognitive therapy” OR “mindfulness-based CT” OR mindfulness based cognitive therapy)
AND
(depress* OR “mood disorder” OR “Mood disorders” OR “depressive disorder” OR “depressive disorders” OR “mood disturbance” OR “affective disorders” OR “affective disorder”)

Results: 55
Appendix B: Excluded Full-Text Articles

Reason Excluded: Abstract Only


Reason Excluded: Background


*Reason Excluded: Background or Commentary*


*Reason Excluded: Case Report*


**Reason Excluded: Children Only**


**Reason Excluded: Conference Proceeding**


Bedard, M., Felteau, M., Marshall, S., Dubois, S., Weaver, B., Gibbons, C., K. Morris, S. Ross, and B. Parker, “Mindfulness-Based Cognitive Therapy Reduces Depression Symptoms in


Chan, J. S., R. T. Ho, C. W. Wang, L. P. Yuen, J. S. Sham, and C. L. Chan, “Effects of Qigong Exercise on Fatigue, Anxiety, and Depressive Symptoms of Patients with Chronic Fatigue Syndrome-Like Illness: A Randomized Controlled Trial,” *Evidence-Based Complementary and Alternative Medicine*, 2013, p. 485341. doi: 10.1155/2013/485341


Chen, Y., X. Yang, L. Wang, and X. Zhang, “A Randomized Controlled Trial of the Effects of Brief Mindfulness Meditation on Anxiety Symptoms and Systolic Blood Pressure in Chinese


Gallegos, A. M., M. Hoerger, N. L. Talbot, J. A. Moynihan, and P. R. Duberstein, “Emotional Benefits of Mindfulness-Based Stress Reduction in Older Adults: The Moderating Roles of


Liu, X., Y. D. Miller, N. W. Burton, and W. J. Brown, “A Preliminary Study of the Effects of Tai Chi and Qigong Medical Exercise on Indicators of Metabolic Syndrome, Glycaemic


Nakamura, Y., D. L. Lipschitz, R. Landward, R. Kuhn, and G. West, “Two Sessions of Sleep-Focused Mind-Body Bridging Improve Self-Reported Symptoms of Sleep and PTSD in


Seyedalinaghi, S., S. Jam, M. Foroughi, A. Imani, M. Mohraz, G. E. Djavid, and D. S. Black, “Randomized Controlled Trial of Mindfulness-Based Stress Reduction Delivered to Human


Wenneberg, S., L. G. Gunnarsson, and G. Ahlstrom, “Using a Novel Exercise Programme for Patients with Muscular Dystrophy. Part II: A Quantitative Study,” *Disability and*
doi: 10.1080/09638280410001696665

Whitebird, R. R., M. Kreitzer, A. L. Crain, B. A. Lewis, L. R. Hanson, and C. J. Enstad,
“Mindfulness-Based Stress Reduction for Family Caregivers: A Randomized Controlled
doi: 10.1093/geront/gns126. As of October 27, 2015:
http://gerontologist.oxfordjournals.org/content/53/4/676.full.pdf

Williams, J. M. G., “Mindfulness-Based Cognitive Therapy for Depression: A New Approach to

Williams, K., C. Abildso, L. Steinberg, E. Doyle, B. Epstein, D. Smith, G. Hobbs, R. Gross, G.
Kelley, and L. Cooper, “Evaluation of the Effectiveness and Efficacy of Iyengar Yoga
Therapy on Chronic Low Back Pain,” Spine (Phila PA 1976), Vol. 34, No. 19, September 1,
2009, pp. 2066-2076. doi: 10.1097/BRS.0b013e3181b315c

Wintering, N. A., J. C. Wilson, and A. B. Newberg, “A Pilot Study to Evaluate the Physiological
Effects of a Spa Retreat That Uses Caloric Restriction and Colonic Hydrotherapy,”

Witkiewitz, K., and S. Bowen, “Depression, Craving, and Substance Use Following a
Randomized Trial of Mindfulness-Based Relapse Prevention,” Journal of Consulting and

Woldt, K. S., “Outcome of Individual Psychological Interventions Following a Cognitive
Behavioural Therapy and Mindfulness Model Applied to Adults with Type 1 and Type 2

Wolf, D. B., and N. Abell, “Examining the Effects of Meditation Techniques on Psychosocial
doi: 10.1177/104973102237471

Wolf, S. L., H. X. Barnhart, N. G. Kutner, E. Mcneely, C. Coogler, and T. Xu, “Selected as the
Best Paper in the 1990s: Reducing Frailty and Falls in Older Persons: An Investigation of Tai
Chi and Computerized Balance Training,” Journal of the American Geriatrics Society,

Tai Chi Exercise Training and Fall Occurrences in Older, Transitionally Frail Adults: A
Randomized, Controlled Trial,” Journal of the American Geriatrics Society, Vol. 51, No. 12,

Lo, S. Mercer, and H. S. Ma, “A Randomized, Controlled Clinical Trial: The Effect of


Reason Excluded: Does Not Report Data for Meditation for MDD


**Reason Excluded: Does Not Report Relevant Outcome Data**


**Reason Excluded: No Relevant Outcomes Reported**


**Reason Excluded: Nonsystematic Review**


**Reason Excluded: Not in English**

**Reason Excluded: Not Limited to MDD**


**Reason Excluded: Not MBCT**

doi: 10.1016/j.jad.2012.05.018


**Reason Excluded: Not RCT**


Reason Excluded: Review


Reason Excluded: Study Protocol


http://www.biomedcentral.com/content/pdf/1472-6882-14-95.pdf


Reason Excluded: Systematic Review


Kraft, K., “CAM for Depression, Anxiety, Grief, and Other Symptoms in Palliative Care,”

Lakhan, S. E., and K. L. Schofield, “Mindfulness-Based Therapies in the Treatment of
Somatization Disorders: A Systematic Review and Meta-Analysis,” *PloS One*, Vol. 8, No. 8,
2013, p. e71834. doi: 10.1371/journal.pone.0071834. As of October 27, 2015:
pone.0071834&representation=PDF

Langhorst, J., P. Klose, G. J. Dobos, K. Bernardy, and W. Hauser, “Efficacy and Safety of
Meditative Movement Therapies in Fibromyalgia Syndrome: A Systematic Review and
Meta-Analysis of Randomized Controlled Trials,” *Rheumatology International*, Vol. 33,
No. 1, January 2013, pp. 193–207. doi: 10.1007/s00296-012-2360-1

Lauche, R., H. Cramer, W. Hauser, G. Dobos, and J. Langhorst, “A Systematic Review and
Meta-Analysis of Qigong for the Fibromyalgia Syndrome,” *Evidence-Based Complementary
October 27, 2015:
http://downloads.hindawi.com/journals/ecam/2013/635182.pdf

Lauche, R., H. Cramer, W. Hauser, G. Dobos, and J. Langhorst, “A Systematic Review and
Meta-Analysis of Qigong for the Fibromyalgia Syndrome,” *Evidence-Based Complementary

Lavretsky, H., “Complementary and Alternative Medicine Use for Treatment and Prevention of

Lawrence, M., J. Booth, S. Mercer, and E. Crawford, “A Systematic Review of the Benefits of
Mindfulness-Based Interventions Following Transient Ischemic Attack and Stroke,”

doi: 10.1093/rheumatology/kem151

Leverone, D., and B. J. Epstein, “Nonpharmacological Interventions for the Treatment of
Rheumatoid Arthritis: A Focus on Mind-Body Medicine,” *Journal of Pharmacy Practice*,

Health, Quality of Life, and Physical Health of Patients with Cancer: A Meta-Analysis,”
Evidence-Based Complementary and Alternative Medicine, Vol. 2011, 2011, p. 659876.
doi: 10.1155/2011/659876


### Appendix C: Evidence Table of Included Studies

<table>
<thead>
<tr>
<th>Study Details</th>
<th>Patients</th>
<th>Intervention/Treatment</th>
<th>Outcomes/Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference: Barnhofer et al., 2009</td>
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<tr>
<td><strong>Study design:</strong></td>
<td>Single-site RCT</td>
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<tr>
<td><strong>ITT analysis:</strong></td>
<td>Yes</td>
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<tr>
<td><strong>Purpose:</strong></td>
<td>To investigate the effects of MBCT in patients suffering from chronic forms of depression using a randomized controlled design with blind assessments</td>
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<tr>
<td><strong>Country:</strong></td>
<td>United Kingdom</td>
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<tr>
<td><strong>Quality rating:</strong></td>
<td>Good</td>
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<tr>
<td><strong>Number of participants:</strong></td>
<td>31 initial, 28 final</td>
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<tr>
<td><strong>Method of identifying patients with MDD:</strong></td>
<td>Current diagnosis of MDD or presence of residual symptoms following a full episode, defined as either meeting DSM-IV criteria for only four instead of at least five symptoms of depression over the past two weeks or suffering from five or more symptoms for at least half of the days, if symptoms had not been present for most of the days over the past two weeks. Assessed via the Structured Clinical Interview for DSM-IV.</td>
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<tr>
<td><strong>Baseline depressive symptom score:</strong></td>
<td>BDI (full sample): MBCT + TAU: 29.36 (9.66); TAU: 31.32 (10.79)</td>
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<tr>
<td><strong>Average age in years (standard deviation [SD]):</strong></td>
<td>MBCT + TAU: 42.07 (11.34); TAU: 41.79 (9.52)</td>
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<tr>
<td><strong>Gender:</strong></td>
<td>MBCT + TAU: 28.6% male; TAU: 35.7% male</td>
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<tr>
<td><strong>Inclusion criteria:</strong></td>
<td>History of at least three previous episodes of MDD or chronic depression; current diagnosis of MDD or presence of residual symptoms following a full episode, defined as either meeting DSM-IV criteria for only four instead of at least five symptoms of depression over the past two weeks or suffering from five or more symptoms for at least half of the days, if symptoms had not been present for most of the days over the past two weeks; history of suicidal ideation (including thoughts of methods of suicide) or suicidal behavior; absence of current mania or hypomania, psychosis, obsessive-compulsive disorder, eating disorder, pervasive developmental disorder or habitual self-harming, or substance abuse or dependence that would significantly interfere with the ability to engage in meditation; adequate written and</td>
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<td><strong>Comparators:</strong></td>
<td>TAU alone</td>
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<td><strong>Follow-up:</strong></td>
<td>At end of intervention</td>
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<tr>
<td><strong>Depressive symptoms, BDI (full sample):</strong></td>
<td>Difference in change in depressive symptom score (BDI) in MBCT + TAU vs. TAU: SMD $-0.92; 95%, CI, {-1.66, to, {-0.17}$</td>
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<td><strong>Response:</strong></td>
<td>Response rate was not significantly different between MBCT + TAU and TAU: RR 0.18; 95% CI 0.02, 1.31</td>
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<tr>
<td><strong>Remission:</strong></td>
<td>NA</td>
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<td><strong>Relapse:</strong></td>
<td>NA</td>
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<tr>
<td><strong>Health-related quality of life:</strong></td>
<td>NA</td>
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<tr>
<td><strong>Adverse events:</strong></td>
<td>Study authors reported that there were no adverse events that were deemed to be related to treatment</td>
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<tr>
<td><strong>Antidepressant use:</strong></td>
<td>Changes in antidepressant use: MBCT + TAU: 2 (14%) TAU: 7 (50%) p=0.052</td>
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<tr>
<td>Study Details</td>
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<td>spoken English to complete all study measures; not currently in individual or group psychotherapy; no current ongoing meditation practice; and age between 18 and 65.</td>
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<tr>
<td><strong>Exclusion criteria:</strong> None reported</td>
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<td>Study Details</td>
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<tr>
<td><strong>Reference:</strong> Batink et al., 2013; Geschwind et al., 2012; Forkmann et al., 2014</td>
<td><strong>Number of participants:</strong> 130 initial, 125 final</td>
<td>MBCT: Followed standard protocol (Segal, Williams, and Teasdale, 2002). Sessions included guided meditation, experiential exercises, and discussions. Participants received CDs with guided exercises.</td>
<td><strong>Depressive symptoms, HRSD-17:</strong> Full sample: Difference in change in depressive symptom score in MBCT + TAU vs. TAU: SMD −0.60; 95% CI −0.95, −0.24</td>
</tr>
<tr>
<td><strong>Study design:</strong> Single-site RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> Residual depression symptomatology (HRSD_{17} ≥7) after at least one episode of MDD, as assessed by the Structured Clinical Interview for DSM-IV</td>
<td></td>
<td>1–2 previous MD episodes: Difference in change in depressive symptom score in MBCT + TAU vs. TAU: SMD −0.93; 95% CI −1.42, −0.44</td>
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<tr>
<td><strong>ITT analysis:</strong> Yes</td>
<td><strong>Baseline depressive symptom score:</strong> HRSD_{17}: 1–2 episodes: MBCT: 9.6 (3.2); TAU: 10.5 (3.7) 3+ episodes: MBCT: 11.1 (4.1); TAU: 9.9 (3.4) Full sample: MBCT: 10.3 (3.7); TAU: 10.2 (3.6)</td>
<td><strong>Depressive symptoms, IDS-SR:</strong> Full sample: Difference in change in depressive symptom score in MBCT + TAU vs. TAU: SMD −0.53; 95% CI −0.88, −0.18</td>
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<tr>
<td><strong>Purpose:</strong> To investigate the effect of MBCT on residual depressive symptoms and whether the effect is contingent on the number of previous depressive episodes</td>
<td><strong>Inventory of Depressive Symptomatology—Self-Report (IDS-SR):</strong> 1–2 episodes: MBCT 19.3 (9.4); TAU: 23.8 (8.8) 3+ episodes: MBCT: 26.0 (11.1); TAU: 20.5 (8.2) Full sample: MBCT 22.4 (10.7); TAU: 22.5 (8.7)</td>
<td><strong>1–2 previous MD episodes:</strong> Difference in change in depressive symptom score in MBCT + TAU vs. TAU: SMD −0.93; 95% CI −1.42, −0.44</td>
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<tr>
<td><strong>Country:</strong> Netherlands</td>
<td><strong>Average age in years (SD):</strong> 2 or fewer episodes: 42.8 (1.7); 3+ prior episodes: 45.2 (1.2); Overall: 43.9 (9.6); MBCT: 44.6 (9.7); TAU: 43.2 (9.5)</td>
<td><strong>3+ previous MD episodes:</strong> Difference in change in depressive symptom score in MBCT + TAU vs. TAU: SMD −0.19; 95% CI −0.71, 0.32</td>
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<tr>
<td><strong>Quality rating:</strong> Fair</td>
<td><strong>Gender:</strong> 2 or fewer prior episodes: 30% male; 3+ prior episodes: 19% male; Overall: 25% male; MBCT: 21.9% male; TAU: 27.3% male</td>
<td><strong>Co-interventions:</strong> Psychological or pharmacological treatment</td>
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<tr>
<td></td>
<td><strong>Inclusion criteria:</strong> Residual depression symptomatology (HRSD_{17} ≥7) after at least one episode of MDD.</td>
<td><strong>Comparator:</strong> TAU: Received psychological and pharmacological treatment</td>
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<td><strong>Exclusion criteria:</strong> Fulfiling criteria for a current major depressive episode, a lifetime diagnosis of schizophrenia, psychotic episodes in the past year, general conditions that made participation in a group intervention impossible, and recent (past four weeks) or upcoming changes in ongoing psychological or pharmacological treatment.</td>
<td><strong>Follow-up:</strong> At end of intervention</td>
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<td><strong>Dosage:</strong> 8 sessions, 2.5 hours once a week, plus daily homework exercises (30 to 60 minutes)</td>
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<td><strong>Response:</strong> NA</td>
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<td><strong>Remission:</strong> NA</td>
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<td><strong>Relapse:</strong> NA</td>
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<td><strong>Health-related quality of life:</strong> NA</td>
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<td><strong>Adverse events:</strong> Study reported that there were no adverse events.</td>
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<td><strong>Antidepressant use:</strong> NA</td>
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<tr>
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<tr>
<td><strong>Reference:</strong> Bondolfi et al., 2010; Jermann et al., 2013</td>
<td><strong>Number of participants:</strong> Bondolfi et al. (2010): 60 initial, 55 final Jermann et al. (2013): 36 initial and 36 final</td>
<td>MBCT: Followed standardized protocol (Segal, Williams, and Teasdale, 2002)</td>
<td><strong>Depressive symptoms, BDI:</strong> 3-Month Follow-Up</td>
</tr>
<tr>
<td><strong>Study design:</strong> Multisite (2) RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> Clinical diagnosis of MDD in remission at time of inclusion</td>
<td><strong>Dosage:</strong> 8 weekly 2-hour sessions</td>
<td>Difference in change in depressive symptom score (BDI) in MBCT + TAU vs. TAU between baseline and 3-month postintervention follow-up: SMD 0.49; 95% CI −0.17, 1.15</td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> Bondolfi et al. (2010): Yes Jermann et al. (2013): NA, no dropout</td>
<td><strong>Baseline depressive symptom score:</strong> Bondolfi et al. (2010): NA Jermann et al. (2013): BDI: MBCT + TAU: 9.8 (9.8) TAU: 6.9 (6.9)</td>
<td><strong>Co-interventions:</strong> TAU, but no antidepressants</td>
<td><strong>9-Month Follow-Up</strong></td>
</tr>
<tr>
<td><strong>Purpose:</strong> Bondolfi et al. (2010): To test if MBCT would reduce the risk of depressive relapse when compared with TAU in the context of the Swiss health care system in a sample of remitted depressed patients with three or more past depressive episodes Jermann et al. (2013): To determine whether cognitive functioning was altered among patients remitted from depression and investigate the possible impact of MBCT on these functions from a longitudinal perspective</td>
<td><strong>Montgomery-Åsberg Depression Rating Scale (MADRS):</strong> MBCT + TAU: 5.4 (4.8) TAU: 3.8 (4.0)</td>
<td><strong>Comparator(s):</strong> TAU: Unrestricted access to any treatment or help service</td>
<td>Difference in change in depressive symptom score in MBCT + TAU vs. TAU between baseline and 9-month postintervention follow-up: SMD 0.82; 95% CI 0.14, 1.51</td>
</tr>
<tr>
<td><strong>Country:</strong> Switzerland</td>
<td><strong>Average age in years:</strong> Bondolfi et al. (2010): MBCT + TAU: Median=46 (min-max 27–63); TAU: Median=49 (min-max 24–66) Jermann et al. (2013): MBCT: 45.4 (SD=11.6); TAU: 48.2 (SD=9.4)</td>
<td><strong>Follow-up:</strong> At end of intervention and 3, 6, 9, and 12 months postintervention</td>
<td><strong>Depressive symptoms, MADRS:</strong> 3-Month Follow-Up</td>
</tr>
<tr>
<td><strong>Quality rating:</strong> Good</td>
<td><strong>Gender:</strong> Bondolfi et al. (2010): MBCT + TAU: 26% male; TAU: 31% male Jermann et al. (2013): 31% male</td>
<td></td>
<td>Difference in change in depressive symptom score (BDI) in MBCT + TAU vs. TAU between baseline and 3-month postintervention follow-up: SMD 0.31; 95% CI −0.35, 0.97</td>
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<td><strong>Inclusion criteria:</strong> History of recurrent major depression according to DSM-IV, assessed with the Structured Clinical Interview for DSM-IV; at least 3 past depressive episodes (2 episodes in the past 5 years and at least one in the past 2 years); remission for at least 3 months at time of enrollment; MADRS≤13, corresponding to the baseline score of 10 on the HRSD17; history of treatment with antidepressants but currently off medication for at least 3 months before enrollment.</td>
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<td><strong>9-Month Follow-Up</strong></td>
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<td><strong>Exclusion criteria:</strong> History of schizophrenia or schizoaffective disorder, current substance abuse, eating disorder, obsessive compulsive disorder, or current bipolar disorder</td>
<td></td>
<td>Difference in change in depressive symptom score in MBCT + TAU vs. TAU between baseline and 9-month postintervention follow-up: SMD 0.72; 95% CI 0.05, 1.39</td>
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<td><strong>Response:</strong> NA</td>
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<td><strong>Remission:</strong> NA</td>
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<td><strong>Relapse (determined through clinical interview):</strong> In ITT sample (over 14 months), relapse in MBCT + TAU vs. TAU: RR 0.84; 95% CI 0.40, 1.77</td>
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<td><strong>Health-related quality of life:</strong> NA</td>
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<td><strong>Adverse events:</strong> Not reported</td>
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<td><strong>Antidepressant use:</strong> Antidepressant reinstatement: MBCT + TAU: 36% TAU: 31%</td>
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<tr>
<td>Study Details</td>
<td>Patients</td>
<td>Intervention/Treatment</td>
<td>Outcomes/Results</td>
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<td>disorder, organic mental disorder, pervasive developmental disorder, borderline personality disorder, dysthymia with onset before age 20, more than four sessions of CBT ever, current psychotherapy or counseling more frequently than once per month, current practice of meditation more than once per week or yoga more than twice per week.</td>
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<td>p=0.78</td>
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</tbody>
</table>
**Study Details**

**Reference:** Britton et al., 2010

**Study design:** Single-site RCT

**ITT analysis:** No

**Purpose:** To examine whether mindfulness meditation was associated with changes in objectively measured polysomnographic sleep profiles and to relate changes in polysomnographic sleep to subjectively reported changes in sleep and depression within the context of a randomized controlled trial

**Country:** United States

**Quality rating:** Poor

<table>
<thead>
<tr>
<th>Study Details</th>
<th>Patients</th>
<th>Intervention/Treatment</th>
<th>Outcomes/Results</th>
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</thead>
<tbody>
<tr>
<td><strong>Number of participants:</strong> 26 initial, 20 final</td>
<td><strong>Method of identifying patients with MDD:</strong> Diagnosis of MDD in past 60 months, but in full or partial remission in the past 8 weeks, as assessed with the Structured Clinical Interview for DSM-IV</td>
<td><strong>Difference in change in depressive symptom score (BDI) in MBCT vs. waitlist:</strong> SMD −1.11; 95% CI −2.07, −0.15</td>
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<tr>
<td><strong>Study design:</strong> Single-site RCT</td>
<td><strong>Baseline depressive symptom score:</strong> BDI: MBCT: 10.3 (6.2); Waitlist control: 8.1 (4.8)</td>
<td><strong>Response:</strong> NA</td>
<td></td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> No</td>
<td><strong>Average age in years (SD):</strong> MBCT: 45.4 (7.1); Waitlist control: 48.1 (9.6)</td>
<td><strong>Remission:</strong> NA</td>
<td></td>
</tr>
<tr>
<td><strong>Purpose:</strong> To examine whether mindfulness meditation was associated with changes in objectively measured polysomnographic sleep profiles and to relate changes in polysomnographic sleep to subjectively reported changes in sleep and depression within the context of a randomized controlled trial</td>
<td><strong>Gender:</strong> MBCT: 30.8% male; Waitlist control: 12.5% male</td>
<td><strong>Relapse:</strong> NA</td>
<td></td>
</tr>
<tr>
<td><strong>Country:</strong> United States</td>
<td><strong>Inclusion criteria:</strong> Met the DSM-IV criteria for major depression in the past 60 months and had a lifetime history of at least three episodes but was in full or partial remission during the past 8 weeks with varying degree of residual symptoms. Partial remission defined as subjective symptom improvement, HRSD$_24$≤20, and the exclusion of individuals with severely depressed mood, severe anhedonia, or active suicidal ideation. Eligible participants reported difficulties with either sleep initiation, sleep maintenance, or early awakening, but not hypersomnia in the past 2 months.</td>
<td><strong>Health-related quality of life:</strong> NA</td>
<td></td>
</tr>
<tr>
<td><strong>Quality rating:</strong> Poor</td>
<td><strong>Exclusion criteria:</strong> History of bipolar disorder, cyclothymia, schizophrenia, schizoaffective disorder, persistent antisocial behavior, repeated self-harm, borderline personality disorder, or organic brain damage; current panic, obsessive compulsive disorder, eating disorder, or substance abuse/dependence; inability to read and write in English; receiving current psychotherapy; already had a regular meditation practice; or had taken antidepressant medication in the past 3 months. Participants were also excluded if they had or suspected an untreated sleep disorder besides insomnia.</td>
<td><strong>Adverse events:</strong> Study authors reported that there were no adverse events.</td>
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<td></td>
<td><strong>MBCT:</strong> Followed standardized protocol (Segal, Williams, and Teasdale, 2002). Focused on cultivating mindfulness or nonjudgmental present-moment awareness of mental content and everyday activities, including sitting, lying down, breathing, walking, and other simple movements. <strong>Dosage:</strong> 8 weekly 3-hour sessions plus one-day retreat and home practice</td>
<td><strong>Antidepressant use:</strong> NA</td>
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<td><strong>Comparator(s):</strong> Waitlist control, no intervention provided during wait time</td>
<td><strong>Follow-up:</strong> At end of intervention</td>
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<tr>
<td>Study Details</td>
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<td>Outcomes/Results</td>
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<tr>
<td>Reference: Chiesa, Mandelli, and Seretti, 2012</td>
<td>Number of participants: 18 initial, 16 final</td>
<td>MBCT: Followed standard manualized protocol (Segal, Williams, and Teasdale, 2002)</td>
<td>Depressive symptoms, HRSD$<em>{21}$: Difference in change in depressive symptom score (HRSD$</em>{21}$) in MBCT plus antidepressants vs. psycho-education plus antidepressants: SMD $-0.81$; 95% CI $-1.83, 0.22$</td>
</tr>
<tr>
<td>Study design: Single-site RCT</td>
<td>Method of identifying patients with MDD: Clinical diagnosis of MDD according to DSM-IV criteria</td>
<td>Dosage: 8 weekly 2-hour sessions; encouraged home practice of 30–45 minutes, 6 times a week</td>
<td>Response: NA</td>
</tr>
<tr>
<td>Purpose: To compare MBCT with a psycho-educational control group for the treatment of patients with major depression</td>
<td>Average age in years (SD): Not reported</td>
<td>Comparator: Psycho-education: Similar to MBCT but no emphasis on mindfulness skills. 8 weekly 2-hour sessions. Encouraged stretching or aerobic activity for 30–45 minutes, 6 times a week</td>
<td>Relapse: NA</td>
</tr>
<tr>
<td>Country: Italy</td>
<td>Gender: Overall: 25% male; MBCT: 22% male; Psycho-education: 29% male</td>
<td>Health-related quality of life: Difference in change in quality-of-life score (Psychological General Well-Being Index) in MBCT plus antidepressants vs. psycho-education plus antidepressants: SMD $-0.81$; 95% CI $-1.84, 0.22$</td>
<td>Adverse events: Not reported</td>
</tr>
<tr>
<td>Quality rating: Fair</td>
<td>Inclusion criteria: Aged 18 years or over; meeting DSM-IV criteria for MDD; being on treatment with antidepressants at adequate dosages for at least 8 weeks; and a failure to achieve remission, defined as HRSD$_{21}$≥8.</td>
<td>Follow-up: At end of intervention</td>
<td>Antidepressant use: NA</td>
</tr>
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<td>Exclusion criteria: Current or past psychosis, bipolar disorder, or substance abuse; severe physical or neurological conditions that could interfere with the engagement in mindfulness practices; and concurrent psychotherapy or engagement in any meditation or yoga practice.</td>
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<thead>
<tr>
<th>Study Details</th>
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<tbody>
<tr>
<td>Reference: Godfrin and van Heeringen, 2010</td>
<td><strong>Number of participants:</strong> 106 initial, 76 final</td>
<td>MBCT: Followed standardized protocol (Segal, Williams, and Teasdale, 2002) with aim to attend, nonjudgmentally and moment-by-moment, to patterns of thoughts, bodily sensations, and feelings</td>
<td><strong>Depressive symptoms, HRSD17:</strong> End of intervention: Difference in change in depressive symptom score in MBCT + TAU vs. TAU + waitlist: SMD = −0.98; 95% CI −1.39, −0.58</td>
</tr>
<tr>
<td><strong>Study design:</strong> Single-site RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> Past history of MDD according to DSM-IV criteria with at least 3 major depressive episodes and the most recent at least 8 weeks prior to study participation</td>
<td><strong>Dosage:</strong> 8 weekly 2.75-hour sessions and at-home exercises 6 times a week for 45 minutes</td>
<td><strong>8 Months:</strong> Difference in change in depressive symptom score in MBCT + TAU vs. TAU + waitlist at 8-month follow-up: SMD = −0.80; 95% CI −1.19, −0.40</td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> Yes</td>
<td><strong>Baseline depressive symptom score:</strong> BDI: MBCT: 17.59 (11.65) TAU + waitlist: 20.44 (12.46)</td>
<td><strong>Comparator(s):</strong> TAU</td>
<td><strong>14 Months:</strong> Difference in change in depressive symptom score in MBCT + TAU vs. TAU + waitlist at 14-month follow-up: SMD = −0.43; 95% CI −0.82, −0.05</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To study the efficacy of MBCT in preventing relapse or recurrence of depression in patients with a history of at least three depressive episodes but who are currently in remission or recovery, MBCT’s effect on the time since study participation until first relapse in depression, and short-term and longer-term effects on mood states and quality of life</td>
<td><strong>HRSD17:</strong> MBCT: 6.59 (3.99) TAU + waitlist: 7.32 (3.65)</td>
<td><strong>Response:</strong> NA</td>
<td></td>
</tr>
<tr>
<td><strong>Country:</strong> Belgium</td>
<td><strong>Average age in years (SD):</strong> MBCT + TAU: 44.9 (10.78); TAU + waitlist: 46.4 (10.37)</td>
<td><strong>Co-interventions:</strong> TAU</td>
<td><strong>Remission:</strong> NA</td>
</tr>
<tr>
<td><strong>Quality rating:</strong> Fair</td>
<td><strong>Gender:</strong> MBCT + TAU: 17.3% male; TAU + waitlist: 20.4% male</td>
<td><strong>Exclusion criteria:</strong> Current DSM-IV-TR diagnoses of chronic depression or dysthymia, substance use disorder, obsessive-compulsive disorder, bipolar disorder, acute psychosis, schizophrenia or schizoaffective disorder, cognitive disorder, organic mental disorder, pervasive developmental disorder, mental retardation, or a primary diagnosis of an axis-II disorder or risk of suicide; an extended experience with zen- or vipassana-meditation (or mindfulness) in the past; more than 1 psychiatric consultation per 3–4 weeks or intensive psychotherapy; meditation practices other than MBCT during the training and/or follow-up; and physical problems that hampered participation in the program. Only patients living in a well-defined study region were included in order to prevent dropout due to</td>
<td><strong>Relapse:</strong> Relapse in MBCT + TAU vs. TAU + waitlist: RR 0.45; 95% CI 0.29, 0.70</td>
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<td><strong>Inclusion criteria:</strong> Aged 18 years or older and had a history of at least 3 depressive episodes according to DSM-IV-TR (text revision) criteria, the end of the last episode being at least 8 weeks before study participation; did not suffer from a current depressive episode according to DSM-IV-TR criteria; HRSD17 ≤ 14.</td>
<td><strong>Inclusion criteria:</strong> Aged 18 years or older and had a history of at least 3 depressive episodes according to DSM-IV-TR criteria, the most recent at least 8 weeks prior to study participation; currently in remission or recovery, MBCT’s effect on the time since study participation until first relapse in depression, and short-term and longer-term effects on mood states and quality of life</td>
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<td>Study Details</td>
<td>Patients</td>
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<td>geographical reasons.</td>
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<td>Mean time to first relapse/recurrence since study participation:</td>
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<td></td>
<td>MBCT + TAU: 39.5 weeks</td>
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<td>TAU + waitlist: 53.7 weeks</td>
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<td>Significant difference between groups in mean time to first relapse (p≤0.001).</td>
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<td>Health-related quality of life (HRQOL):</td>
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<td>Quality of Life in Depression Scale:</td>
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<td>Difference in change in HRQOL in MBCT + TAU vs. TAU + waitlist:</td>
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<td>SMD =−1.02; 95% CI −1.42, −0.61</td>
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<td>8 Months:</td>
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<td>Difference in change in HRQOL in MBCT + TAU vs. TAU + waitlist at 8-month follow-up:</td>
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<td>SMD =−0.67; 95% CI −1.06, −0.28</td>
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<td>14 Months:</td>
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<td>Difference in change in HRQOL in MBCT + TAU vs. TAU + waitlist at 14-month follow-up:</td>
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<td>SMD =−0.68; 95% CI −1.07, −0.29</td>
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<td>Adverse events: Not reported</td>
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<td>Antidepressant use:</td>
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<td>Baseline:</td>
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<td>MBCT + TAU: n=38, 73.1%</td>
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<td>TAU + waitlist: n=33, 61.1%</td>
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<td>End of intervention:</td>
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<td></td>
<td>MBCT + TAU: n=34, 75.6%</td>
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<td>TAU + waitlist: n=29, 60.4%</td>
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<td>8 Months:</td>
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<td></td>
<td>MBCT + TAU: n=27, 64.3%</td>
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<td>TAU + waitlist: n=26, 56.5%</td>
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<td>14 Months:</td>
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<td></td>
<td>MBCT + TAU: n=25, 64.1%</td>
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<td>TAU + waitlist: n=28, 62.2%</td>
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<td>No group time significance reported.</td>
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<td>Study Details</td>
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<tr>
<td>Reference: Hepburn et al., 2009; Crane et al., 2008</td>
<td><strong>Number of participants:</strong> 68 initial, 43 final</td>
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<tr>
<td><strong>Study design:</strong> Participants in remission or recovery with suicidality randomized to MBCT or waitlist control using stratification (suicidal history and past depressive episodes)</td>
<td><strong>Method of identifying patients with MDD:</strong> BDI</td>
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<tr>
<td><strong>Purpose:</strong> To compare short-term effects of MBCT and TAU on thought suppression in individuals with past suicidal depression</td>
<td><strong>Baseline depressive symptom score:</strong> BDI: MBCT: 15.62 (13.84) TAU: 12.83 (9.59)</td>
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<tr>
<td><strong>Country:</strong> United Kingdom</td>
<td><strong>Average age in years (SD):</strong> MBCT: 48.77 (9.04); TAU: 41.24 (9.00)</td>
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<tr>
<td><strong>Quality rating:</strong> Poor</td>
<td><strong>Gender:</strong> 26.5% male</td>
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<td><strong>Inclusion criteria:</strong> Had experienced both depression (minimum one episode) and suicidality (suicide attempt or severe ideation with a plan); met criteria for depression recovery.</td>
<td><strong>Exclusion criteria:</strong> Non-fluent English, receiving CBT without subsequent depressive relapse, and symptoms of substance misuse, psychosis, or mania in the past 6 months.</td>
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<tr>
<td><strong>ITT analysis:</strong> No</td>
<td><strong>MBCT:</strong> Program for suicidality, 2-hour weekly classes plus 1 day-long session and daily homework</td>
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<td><strong>Co-interventions:</strong> Psychotherapy and medication</td>
<td><strong>Dosage:</strong> 8 weekly 2-hour sessions plus one-day retreat</td>
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<td><strong>Comparator(s):</strong> TAU: Including medication and any help-seeking during wait period</td>
<td><strong>Follow-up:</strong> At end of intervention</td>
<td></td>
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<tr>
<td><strong>Depressive symptoms, BDI:</strong> Difference in change in depressive symptom score (BDI) in MBCT + TAU vs. TAU: SMD −0.30; 95% CI −0.91, 0.30</td>
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<td>Response: NA</td>
<td>Remission: NA</td>
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<td>Relapse: NA</td>
<td>Health-related quality of life: NA</td>
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<tr>
<td>Adverse events: Not reported</td>
<td>Antidepressant use: NA</td>
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<td>Study Details</td>
<td>Patients</td>
<td>Intervention/Treatment</td>
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<tr>
<td><strong>Reference:</strong> Keune et al., 2011; Bostanov et al., 2012</td>
<td><strong>Number of participants:</strong> 91 initial, 78 final</td>
<td>MBCT: Followed standardized protocol (Segal, Williams, and Teasdale, 2002)</td>
<td><strong>Depressive symptoms, BDI:</strong> Difference in change in depressive symptom score (BDI) in MBCT + TAU vs. TAU + waitlist: SMD $-1.85$; 95% CI $-2.38$, $-1.31$</td>
</tr>
<tr>
<td><strong>Study design:</strong> Single-site RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> At least three past major depressive episodes, with the most recent episode in remission for at least 4 weeks. Assessed via the German version of the Structured Clinical Interview for DSM-IV.</td>
<td>Dosage: 8 weekly sessions</td>
<td><strong>Response:</strong> NA</td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> No</td>
<td><strong>Baseline depressive symptom score:</strong> BDI: MBCT: 9.05 (8.60); TAU + Waitlist: 12.70 (9.19)</td>
<td>Co-interventions: TAU</td>
<td><strong>Remission:</strong> NA</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To explore the psychological and psychophysiological effects of MBCT in recurrently depressed patients, especially the effect of MBCT on rumination and mindfulness as indicators of global cognitive style, as well as on depressive symptomatology</td>
<td><strong>Average age in years (SD):</strong> MBCT: 48.93 (9.68); TAU + Waitlist: 45.24 (10.50)</td>
<td>Comparator(s): Waitlist control: Advised to consult with their medical doctor or other sources of help if needed</td>
<td><strong>Relapse:</strong> NA</td>
</tr>
<tr>
<td><strong>Country:</strong> Germany</td>
<td><strong>Gender:</strong> Overall: 26% male; MBCT: 25% male; TAU + waitlist: 27% male</td>
<td>Follow-up: At end of intervention</td>
<td><strong>Health-related quality of life:</strong> NA</td>
</tr>
<tr>
<td><strong>Quality rating:</strong> Poor</td>
<td><strong>Inclusion criteria:</strong> Ages 18 to 65; met criteria for at least three major depressive episodes in the past; in at least partial remission (defined as not meeting the minimum criteria for a major depressive episode within the past 4 weeks); had stopped using medication at least 4 weeks prior to the interview; agreed not to start medication during the course of the study, unless advised otherwise by a psychiatrist. If medicated, medication had to be stable for at least one month, and participants needed to agree not to change medication or dose during the course of therapy until the completion of the last electroencephalogram assessment, unless dose or type was recommended to be changed by a psychiatrist.</td>
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<td><strong>Adverse events:</strong> Not reported</td>
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<td><strong>Exclusion criteria:</strong> Not giving or withdrawing informed consent, presence or history of substance abuse, eating or obsessive-compulsive disorder during the past three years, a history of schizophrenia or schizoaffective disorder, any neurological disorder, and borderline personality disorder. Participants also were not included if they had ever practiced any form of meditation on a regular basis.</td>
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<td><strong>Antidepressant use:</strong> NA</td>
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<td>Study Details</td>
<td>Patients</td>
<td>Intervention/Treatment</td>
<td>Outcomes/Results</td>
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<tr>
<td><strong>Reference:</strong> Kuyken, Byford, et al., 2008; Kuyken, Watkins, et al., 2010</td>
<td><strong>Number of participants:</strong> 123 initial, 104 final</td>
<td><strong>MBCT:</strong> Followed standardized protocol (Segal, Williams, and Teasdale, 2002). Content included guided mindfulness practices, inquiry into patients' experience of these practices, review of weekly homework, and teaching/discussion of cognitive-behavioral skills, plus support for tapering and discontinuation of m-ADM after 4–5 weeks of treatment.</td>
<td><strong>Depressive symptoms, HRSD$_{17}$:</strong> 3 Months: Difference in change in depressive symptom score (HRSD) in MBCT + m-ADM vs. m-ADM at 3 months: SMD = −0.30; 95% CI −0.66, 0.05 15 Months: Difference in change in depressive symptom score in MBCT + m-ADM vs. m-ADM at 15 months: SMD = −0.23; 95% CI −0.58, 0.13</td>
</tr>
<tr>
<td><strong>Study design:</strong> Single-site RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> Clinical diagnosis of MDD in full or partial remission according to DSM-IV criteria</td>
<td><strong>Dosage:</strong> 8 weekly 2-hour sessions plus 4 follow-up sessions in the following year</td>
<td><strong>Depressive symptoms: BDI-II</strong> 3 Months: Difference in change in depressive symptom score in MBCT + m-ADM vs. m-ADM at 3 months: SMD = −0.36; 95% CI −0.72, 0.00 15 Months: Difference in change in depressive symptom score in MBCT + m-ADM vs. m-ADM at 15 months: SMD = −0.33; 95% CI −0.69, 0.03</td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> Yes</td>
<td><strong>Baseline depressive symptom score:</strong> BDI-II: MBCT: 18.51 (10.91) m-ADM: 20.15 (12.86) HRSD$_{17}$: MBCT: 5.62 (4.3) m-ADM: 5.76 (4.69)</td>
<td><strong>Co-interventions:</strong> Antidepressants tapered over course of MBCT</td>
<td><strong>Response:</strong> NA <strong>Remission:</strong> NA</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To examine whether MBCT provides an alternative approach to maintenance antidepressant medication (m-ADM) in preventing depressive relapse/recurrence and to compare MBCT and m-ADM in terms of residual depressive symptoms, comorbid psychiatric diagnoses, quality of life, and cost-effectiveness</td>
<td><strong>Average age in years (SD):</strong> MBCT: 48.95 (10.55); m-ADM: 49.37 (11.84)</td>
<td><strong>Comparator(s):</strong> m-ADM: Patients’ physicians were asked to manage m-ADM in line with standard clinical practice and ensure that the dose remained within therapeutic limits</td>
<td><strong>Relapse for ITT Analysis</strong> <strong>Mean total # of relapses/recurrences:</strong> MBCT: 1.45 (95% CI 1.21, 1.69) m-ADM: 1.57 (95% CI 1.32, 1.81) <strong>Duration of relapses/recurrences (in months):</strong> MBCT: 3.36 (95% CI 2.2, 4.5) m-ADM: 3.0 (95% CI 2.1, 3.9) <strong>Severity of relapses/recurrences (DSM–IV severity specifier, 0–4):</strong> MBCT: 1.79 (95% CI 1.56, 2.02) m-ADM: 1.72 (95% CI 1.48, 1.95)</td>
</tr>
<tr>
<td><strong>Country:</strong> United Kingdom</td>
<td><strong>Gender:</strong> MBCT: 23%; m-ADM: 24%</td>
<td><strong>Follow-up:</strong> 3, 6, 9, 12, and 15 months after baseline</td>
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<tr>
<td><strong>Quality rating:</strong> Fair</td>
<td><strong>Inclusion criteria:</strong> Three or more previous episodes of depression meeting criteria for depression according to the DSM-IV; 18 years of age or older; on a therapeutic dose of m-ADM in line with the British National Formulary for at least the previous 6 months; and in either full or partial remission from the most recent episode of depression.</td>
<td><strong>Exclusion criteria: Comorbid diagnoses of current substance dependence; organic brain damage; current/past psychosis; bipolar disorder; persistent antisocial behavior; persistent self-injury requiring clinical management/therapy; unable to engage with MBCT for physical, practical, or other reasons (e.g., very disabling physical problem, unable to comprehend materials); and formal concurrent psychotherapy.</strong></td>
<td><strong>Relapse in MBCT + m-ADM vs. m-ADM at 15 months after baseline</strong></td>
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<td>Study Details</td>
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<td>Intervention/Treatment</td>
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<td>month follow-up:</td>
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<td>RR 0.80; 95% CI 0.57, 1.11</td>
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<td><strong>Health-related quality of life:</strong></td>
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<tr>
<td><strong>WHO Quality of Life – Brief, Physical:</strong></td>
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<td>3 Months:</td>
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<td>Difference in change in physical HRQOL in MBCT + m-ADM vs. m-ADM at 3 months: SMD −0.10; 95% CI −0.46, 0.25</td>
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<td>15 Months:</td>
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<td>Difference in change in physical HRQOL in MBCT + m-ADM vs. m-ADM at 15 months: SMD −0.08; 95% CI −0.44, 0.27</td>
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<td><strong>WHO Quality of Life – Brief, Psychological:</strong></td>
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<tr>
<td>3 Months:</td>
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<td>Difference in change in psychological HRQOL in MBCT + m-ADM vs. m-ADM at 3 months: SMD −0.16; 95% CI −0.51, 0.19</td>
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<td>15 Months:</td>
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<td>Difference in change in psychological HRQOL in MBCT + m-ADM vs. m-ADM at 15 months: SMD −0.13; 95% CI −0.48, 0.22</td>
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<tr>
<td><strong>WHO Quality of Life – Brief, Social:</strong></td>
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<tr>
<td>3 Months:</td>
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<td>Difference in change in social HRQOL in MBCT + m-ADM vs. m-ADM at 3 months: SMD −0.21; 95% CI −0.56, 0.15</td>
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<tr>
<td>15 Months:</td>
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<td>Difference in change in social HRQOL in MBCT + m-ADM vs. m-ADM at 15 months: SMD −0.08; 95% CI −0.44, 0.27</td>
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<td><strong>Adverse events:</strong></td>
<td>Study authors reported that there were no adverse events recorded through the oversight of the Trial Steering Committee.</td>
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<td><strong>Antidepressant costs:</strong></td>
<td>Mean difference of MBCT vs. m-ADM: −$103 (95% CI −$191, −$14)</td>
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<td>Study Details</td>
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<tr>
<td>Reference: Ma and Teasdale, 2004</td>
<td><strong>Number of participants:</strong> 75 initial, 68 final</td>
<td><strong>MBCT:</strong> Followed standardized protocol (Segal, Williams, and Teasdale, 2002)</td>
<td><strong>Depressive symptoms:</strong> NA</td>
</tr>
<tr>
<td>Study design: Single-site RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> History of recurrent MDD according to DSM-IV criteria, currently in remission or recovery</td>
<td><strong>Dosage:</strong> 8 weekly 2-hour sessions plus daily homework; follow-up meetings 1 and 6 months after intervention</td>
<td><strong>Response:</strong> NA</td>
</tr>
<tr>
<td>ITT analysis: Yes</td>
<td><strong>Baseline depressive symptom score:</strong> BD; MBCT: 13.49 (7.16) TAU: 15.13 (9.51)</td>
<td><strong>Co-interventions:</strong> TAU</td>
<td><strong>Remission:</strong> NA</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To compare response to MBCT in a group of patients with three or more episodes of depression versus a group with only two (recent) episodes</td>
<td><strong>HRSD; MBCT: 5.70 (3.02) TAU: 5.68 (2.97)</strong></td>
<td><strong>Comparator(s):</strong> TAU: Instructed to seek help as usual</td>
<td><strong>Relapse:</strong> Full sample (2+ previous major depressive episodes) in ITT sample: Relapse in MBCT + TAU vs. TAU: RR 0.63; 95% CI 0.39, 1.01</td>
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<tr>
<td>Country: United Kingdom</td>
<td><strong>Average age in years (SD):</strong> MBCT 42.9 (8.4); TAU: 46.1 (9.3)</td>
<td><strong>Follow-up:</strong> At the end of the intervention and 3, 6, 9, and 12 months postintervention</td>
<td><strong>2 previous major depressive episodes in the ITT sample:</strong> Relapse in MBCT + TAU vs. TAU: RR 2.50; 95% CI 0.60, 10.34</td>
</tr>
<tr>
<td>Quality rating: Good</td>
<td><strong>Gender:</strong> MBCT: 27% male; TAU: 21% male</td>
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<td><strong>3 or more previous major depressive episodes in the ITT sample:</strong> Relapse in MBCT + TAU vs. TAU: RR 0.46; 95% CI 0.27, 0.79</td>
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<td><strong>Inclusion criteria:</strong> 18–65 years of age; meet enhanced DSM–IV criteria for a history of recurrent major depression—these normally require a history of two or more previous episodes of DSM–IV major depression in the absence of a history of mania or hypomania; at least two episodes of major depression occurred within the past 5 years, and at least one of those episodes was within the past 2 years; had a history of treatment by a recognized antidepressant medication, but off antidepressant medication and in recovery/remission at the time of baseline assessment and for at least the preceding 12 weeks; and HSRD&lt;10 at baseline assessment.</td>
<td><strong>Health-related quality of life:</strong> NA</td>
<td><strong>Adverse events:</strong> Not reported</td>
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<td></td>
<td><strong>Exclusion criteria:</strong> History of schizophrenia or schizoaffective disorder, current substance abuse, borderline personality disorder, organic mental disorder or pervasive developmental delay, current obsessive-compulsive disorder, current eating disorder, dysthymia before age 20, more than four lifetime sessions of CBT, and current psychotherapy or counseling more frequently than once per month.</td>
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<td><strong>Antidepressant use during study period:</strong> 2 previous major depressive episodes: MBCT + TAU: 13%; TAU: 36%; p&gt;0.10</td>
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<td>3 or more previous major depressive episodes: MBCT + TAU: 21%; TAU: 33%; p&gt;0.10</td>
<td>2 previous major depressive episodes: MBCT + TAU: 27.0 (0); TAU: 27.5 (14.5); p&gt;0.10</td>
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<td>3 or more previous major depressive episodes: MBCT + TAU: 25.4 (8.2); TAU: 34.6 (20.2); p&gt;0.10</td>
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<tr>
<td>Study Details</td>
<td>Patients</td>
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<td><strong>Dosage SSI (mg)</strong></td>
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<td>2 previous major depressive episodes:</td>
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<td></td>
<td>MBCT + TAU: 26.7 (0); TAU: 22.5 (5.0)</td>
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<td>p&gt;0.10</td>
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<td>3 or more previous major depressive episodes:</td>
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<td>MBCT + TAU: 27.0 (5.4); TAU: 23.6 (8.9)</td>
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<td>Study Details</td>
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<tr>
<td>Reference: Manicavasgar, Parker, and Perich, 2011</td>
<td>Number of participants: 69 initial, 45 final</td>
<td>MBCT: Modified MBCT protocol (Segal, Williams, and Teasdale, 2002). Yoga instruction and DVD-based mindfulness-based stress reduction program were omitted. Purchase of program book made optional rather than compulsory.</td>
<td>Depressive symptoms, BDI-II: Postintervention: Difference in change in depressive symptom score in MBCT + TAU vs. CBT + TAU: SMD −0.15; 95% CI −0.74, 0.44</td>
</tr>
<tr>
<td>Study design: Participants in eight of the 11 treatment groups were randomly assigned to the CBT or MBCT condition. Three of the 11 treatment groups were run according to therapist availability, and group participants were assigned sequentially.</td>
<td>Method of identifying patients with MDD: Met DSM-IV criteria for MDD as assessed by the computerized version of the Composite International Diagnostic Interview</td>
<td>Dosage: 8-week course, group sessions for 2–2.5 hours 1 time a week, plus home practice</td>
<td>6 Months: Difference in change in depressive symptom score in MBCT + TAU vs. CBT + TAU at 6 months: SMD 0.70; 95% CI −0.26, 1.65</td>
</tr>
<tr>
<td>ITT analysis: No</td>
<td>Baseline depressive symptom score: BDI-II: MBCT: 32.42 (9.01) CBT: 36.23 (11.11)</td>
<td>Comparator: CBT based on standardized protocol (Beck et al., 1979), 8 weekly sessions of 2–2.5 hours, plus home practice</td>
<td>12 Months: Difference in change in depressive symptom score in MBCT + TAU vs. CBT + TAU at 15 months: SMD 0.18; 95% CI −0.58, 0.93</td>
</tr>
<tr>
<td>Purpose: To examine the comparative effectiveness of MBCT and CBT as treatments for nonmelancholic depression</td>
<td>Average age in years (SD): MBCT: 47 (13.84); CBT: 45 (12.94)</td>
<td>Follow-up: At end of intervention and 6 and 12 months postintervention</td>
<td>Response: NA</td>
</tr>
<tr>
<td>Country: Australia</td>
<td>Gender: MBCT: 37% male; CBT: 34% male</td>
<td>Co-interventions: TAU</td>
<td>Remission: NA</td>
</tr>
<tr>
<td>Quality rating: Poor</td>
<td>Inclusion criteria: Aged 18 years or over; meeting DSM-IV criteria for MDD on the computerized version of the Composite International Diagnostic Interview; BDI-II ≥20 at telephone screening; reporting low mood for at least three preceding months; being proficient in English; not having engaged in CBT, mindfulness, or meditation/relaxation (operationalized as more than four sessions of regular meditation/relaxation) over the preceding 12 months; being under supervision of a case manager/clinician; not commencing antidepressant medication or, if medicated, not changing their antidepressant medication regime over the preceding three months; and preparedness to commit to an 8-week group program.</td>
<td>Adverse events: Not reported</td>
<td>Relapse: NA</td>
</tr>
<tr>
<td>Exclusion criteria: Current diagnosis of melancholic depression or bipolar disorder; a history of any psychotic illness; dementia; current active suicidal ideation; being hospitalized; concurrent treatment using medication or CBT; drug/alcohol dependence; daytime anxiolytic medication (which could potentially impair concentration); current antenatal or postnatal depression (which could be related to hormonal factors); currently in receipt of antipsychotic or mood stabilizing medication; and history of treatment with more than two antidepressant drugs.</td>
<td></td>
<td>Health-related quality of life: Social and Occupational Functioning Scale: Difference in change in health-related quality of life score in MBCT + TAU vs. CBT + TAU: SMD −0.04; 95% CI −0.63, 0.56</td>
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Antidepressant use: NA
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<th>Intervention/Treatment</th>
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<tbody>
<tr>
<td>Reference: Omidi et al., 2013</td>
<td>Number of participants: 90 initial, 90 final</td>
<td>MBCT: Standardized MBCT program (Segal, Williams, and Teasdale, 2002) with the addition of behavioral enhancement components of CBT for depression</td>
<td>Depressive symptoms, Brief Symptom Inventory Depression Scale: Difference in change in depressive symptom score in MBCT + TAU vs. TAU: SMD $\sim 1.53$; 95% CI $\sim 2.11, -0.96$</td>
</tr>
<tr>
<td>Study design: Single-site RCT</td>
<td>Method of identifying patients with MDD: Clinical diagnosis of MDD</td>
<td>Dosage: 8 2-hour sessions, once a week</td>
<td>Difference in change in depressive symptom score in MBCT + TAU vs. CBT + TAU: SMD $\sim 0.00$; 95% CI $\sim 0.51, -0.51$</td>
</tr>
<tr>
<td>ITT analysis: NA, no drop out</td>
<td>Baseline depressive symptom score: Brief Symptom Inventory, depression subscale: MBCT: 2.05(0.84) CBT: 2.18 (0.57) TAU: 2.18(0.85)</td>
<td>Co-interventions: Usual care</td>
<td>Response: NA</td>
</tr>
<tr>
<td>Purpose: To evaluate the efficacy of MBCT and traditional CBT with TAU to reduce psychiatric symptoms in a sample of patients with MDD</td>
<td>Average age in years (SD): MBCT: 32 (6.3); CBT: 30 (5.2); TAU: 35 (4.8)</td>
<td>Comparators (2): CBT: Standardized treatment protocol developed by Emery (2000) TAU: Continued under the care of a therapist and/or psychiatrist</td>
<td>Remission: NA</td>
</tr>
<tr>
<td>Country: Iran</td>
<td>Gender: MBCT: 20% male; CBT: 34% male; TAU: 47% male</td>
<td>Follow-up: At end of intervention</td>
<td>Relapse: NA</td>
</tr>
<tr>
<td>Quality rating: Poor</td>
<td>Inclusion criteria: Meet DSM-IV criteria for MDD.</td>
<td>Health-related quality of life: NA</td>
<td>Adverse events: Not reported</td>
</tr>
<tr>
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<td>Exclusion criteria: BMD (acronym undefined), psychosis, drug abuse, organic history, eating disorder, and suicidality.</td>
<td>Antidepressant use: NA</td>
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<td>Study Details</td>
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<tr>
<td><strong>Reference:</strong> Segal et al., 2010</td>
<td><strong>Number of participants:</strong> 64 initial, 64 final</td>
<td>MBCT: Followed standardized protocol (Segal, Williams, and Teasdale, 2002). Antidepressants discontinued via 4-week taper.</td>
<td><strong>Depressive symptoms:</strong> NA</td>
</tr>
<tr>
<td><strong>Study design:</strong> 2-stage study</td>
<td><strong>Method of identifying patients with MDD:</strong> Prior to stage 1, diagnosis of MDD as assessed with the Structured Clinical Interview for DSM-IV 17</td>
<td><strong>Dosage:</strong> 8 weekly 2-hour sessions, plus a retreat and daily at-home exercises</td>
<td><strong>Response:</strong> NA</td>
</tr>
<tr>
<td><strong>Stage 1:</strong> acute treatment of depression with antidepressants</td>
<td><strong>Baseline depressive symptom score:</strong> HRSD17; m-ADM: 2.0 (2.3); MBCT: 3.0 (2.8); Pla + Clin: 3.3 (3.0)</td>
<td><strong>Comparator(s):</strong> 2 comparison groups: (1) m-ADM: Remained on same drug regimen at maximum tolerated effective dose (2) Pla + Clin: Patients tapered off antidepressant with placebo replacements, plus clinical management</td>
<td><strong>Remission Relapse:</strong> Structured Clinical Interview for DSM-IV (assessing relapse): Relapse in MBCT vs. m-ADM: RR 0.80; 95% CI 0.39, 1.62</td>
</tr>
<tr>
<td><strong>Stage 2:</strong> Among stage 1 participants who remitted, RCT with 3 arms: (1) maintenance antidepressant medication (m-ADM), (2) discontinuation of antidepressant and addition of MBCT, and (3) discontinuation of antidepressant, substitution with placebo pills and clinical management (Pla + Clin)</td>
<td><strong>Quick Inventory of Depressive Symptomatology:</strong> m-ADM: 3.0 (1.7); MBCT: 3.4 (2.4); Pla + Clin: 2.9 (2.3)</td>
<td>Follow-up: At the end of the intervention, monthly for the next 3 months, and bimonthly for the remainder of the 18-month maintenance phase</td>
<td>Relapse in MBCT and clinical management vs. placebo and clinical management: RR 0.65; 95% CI 0.34, 1.62</td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> Yes</td>
<td><strong>Average age in years (SD):</strong> Overall: 44 (11); m-ADM: 45.8 (11.4); MBCT: 44.8 (9.4); Pla + Clin: 41.9 (11.6)</td>
<td></td>
<td>In stable remitters (maintained an HRSD17 score of 7 or less across this interval): Relapse in MBCT vs. m-ADM: RR 1.06; 95% CI 0.54, 2.07</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To test the relative efficacy of MBCT, m-ADM, and placebo plus clinical management for prevention of relapse or recurrence in patients with recurrent depression who have achieved remission through antidepressant pharmacotherapy</td>
<td><strong>Gender:</strong> Overall: 42% male; m-ADM: 29% male; MBCT: 50% male; Pla + Clin: 33% male</td>
<td></td>
<td>Relapse in MBCT and clinical management vs. placebo and clinical management: RR 1.25; 95% CI 0.54, 2.07</td>
</tr>
<tr>
<td><strong>Country:</strong> Canada</td>
<td><strong>Inclusion criteria:</strong> Diagnosis of MDD according to DSM-IV criteria; a score of 16 or higher on the HRSD17; 2 or more previous episodes of MDD (to ensure that those randomized would have a minimum of 3 past episodes); age between 18 and 65 years; English-speaking; and the ability to provide informed consent.</td>
<td></td>
<td>In unstable remitters (achieved an HRSD17 score of 7 or less but had occasional elevated scores between 8 and 14 across this interval): Relapse in MBCT vs. m-ADM vs. RR 1.02; 95% CI 0.30, 3.45</td>
</tr>
<tr>
<td><strong>Quality rating:</strong> Fair</td>
<td><strong>Exclusion criteria:</strong> Current diagnosis of bipolar disorder, substance abuse disorder, schizophrenia, or borderline or antisocial personality disorder; a trial of electroconvulsive therapy within the past 6 months; depression secondary to a concurrent medical disorder; current or planned pregnancy within the 6 months of acute-phase treatment; and current practice of meditation more than once per week or yoga more than twice per week.</td>
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<td>Relapse in MBCT and clinical management vs. placebo and clinical management: RR 0.39; 95% CI 0.17, 0.88</td>
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<td><strong>Follow-up:</strong></td>
<td>Health-related quality of life: NA</td>
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<td>Adverse events: Not reported</td>
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<td>Antidepressant use: NA</td>
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<td>Study Details</td>
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<tr>
<td><strong>Reference:</strong> Shahar et al., 2010</td>
<td><strong>Number of participants:</strong> 52 initial, 45 final</td>
<td><strong>MBCT:</strong> Followed standardized protocol (Segal, Williams, and Teasdale, 2002). Sessions focused on cultivating mindfulness or nonjudgmental present-moment awareness of mental content and everyday activities, including sitting, lying down, breathing, walking, and other simple movements.</td>
<td><strong>Depressive symptoms, BDI:</strong> Difference in change in depressive symptom score (BDI) in MBCT + TAU vs. TAU + waitlist control: SMD $-1.14$; 95% CI $-1.78$, $-0.51$</td>
</tr>
<tr>
<td><strong>Study design:</strong> Single-site RCT</td>
<td><strong>Method of identifying patients with MDD:</strong> Diagnosis of MDD in the past 60 months, with lifetime history of at least 3 episodes, as assessed by the Structured Clinical Interview for DSM-IV. In partial remission in last 2 months.</td>
<td><strong>Response:</strong> NA</td>
<td><strong>Response:</strong> NA</td>
</tr>
<tr>
<td>ITT analysis: No</td>
<td><strong>Baseline depressive symptom score:</strong> BDI: MBCT: 9.10 (6.10) Waitlist control: 10.16 (6.20)</td>
<td><strong>Remission:</strong> NA</td>
<td><strong>Remission:</strong> NA</td>
</tr>
<tr>
<td><strong>Purpose:</strong> To examine the immediate (pre- to postintervention) effects of MBCT on reductions in depressive symptoms</td>
<td><strong>Average age in years (SD):</strong> MBCT: 46.58 (7.77); Waitlist control: 46.74 (11.70)</td>
<td><strong>Relapse:</strong> NA</td>
<td><strong>Relapse:</strong> NA</td>
</tr>
<tr>
<td>Country: United States</td>
<td><strong>Gender:</strong> MBCT: 23.08% male; Waitlist control: 5.26% male</td>
<td><strong>Health-related quality of life:</strong> NA</td>
<td><strong>Health-related quality of life:</strong> NA</td>
</tr>
<tr>
<td>Quality rating: Poor</td>
<td><strong>Inclusion criteria:</strong> Met DSM-IV criteria for major depression in the past 60 months and had a lifetime history of at least 3 episodes, but was in partial remission during the past 8 weeks with a varying degree of residual symptoms. Partial remission was defined by a subjectively reported improvement in symptoms in the past 2 months, HRSD$_{24}$$\leq20$, and the exclusion of severely depressed mood, severe anhedonia, or active suicidal ideation. No change in antidepressant type or dose during the 3 months prior to enrollment or during the active phase of the study.</td>
<td><strong>Adverse events:</strong> Authors reported that there were no adverse events during the trial.</td>
<td><strong>Antidepressant use:</strong> NA</td>
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<td><strong>Exclusion criteria:</strong> History of bipolar disorder, cyclothymia, schizophrenia, schizoaffective disorder, persistent antisocial behavior or repeated self-harm, borderline personality disorder, organic brain damage; current panic, obsessive-compulsive disorder, eating disorder, or substance abuse/dependence; inability to read and write in English; receiving current psychotherapy; already had a regular meditation practice.</td>
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**Dosage:** 8 weekly 3-hour sessions, plus a one-day retreat and at-home practice Co-interventions: TAU Comparator(s): Waitlist control group Follow-up: At end of intervention
### Study Details

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<tr>
<td><strong>Study design:</strong> Multisite (3) RCT. Patients randomized to MBCT + TAU or TAU + waitlist control at three sites. Randomization stratified by “recency of recovery from last episode of depression and number of previous episodes of MDD.”</td>
</tr>
<tr>
<td><strong>ITT analysis:</strong> Yes</td>
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<tr>
<td><strong>Purpose:</strong> To evaluate MBCT as a mediator for relapse/recurrence</td>
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<td><strong>Country:</strong> Canada/United Kingdom</td>
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<td><strong>Quality rating:</strong> Good</td>
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### Patients

| **Number of participants:** 145 initial, 137 final |
| **Method of identifying patients with MDD:** HRSD_{17}\leq 10, BDI, Clinical diagnosis |
| **Baseline depressive symptom score:** NA |
| **Average age in years (SD):** MBCT: 40.7 (10.3); TAU: 46.2 (9.6) |
| **Gender:** MBCT: 26% male; TAU: 22% male |
| **Inclusion criteria:** 18 to 65 years of age; meeting enhanced DSM-III criteria for a history of recurrent major depression—these normally require a history of two or more previous episodes of DSM-III major depression in the absence of a history of mania or hypomania; at least two episodes of major depression within the past 5 years, with at least one of those episodes within the past 2 years; a history of treatment by a recognized antidepressant medication, but off antidepressant medication; in recovery/remission at the time of baseline assessment and for at least the preceding 12 weeks (it was not possible to determine the adequacy of treatment by antidepressant medication; rather, this criterion was used as an indicator that, in the naturalistic course of service delivery, patients had been judged as appropriate for pharmacotherapy by a treating physician); and, HRSD_{17}\leq 10 at baseline assessment. |

### Intervention/Treatment

| **MBCT:** Manualized 2-hour weekly sessions + daily homework, weekly for first 8 weeks, and monthly for final 4 sessions |
| **Dosage:** 12 sessions |
| **Co-interventions:** Care from general practitioner, psychiatric treatment (out/inpatient), counseling, medication |
| **Comparator(s):** TAU: Instructed to seek help as needed |
| **Follow-up:** Bimonthly for 1 year |

### Outcomes/Results

<p>| <strong>Depressive symptoms:</strong> NA |
| <strong>Response:</strong> NA |
| <strong>Remission:</strong> NA |
| <strong>Relapse:</strong> 2 episodes of depression (23% of sample): Relapse in MBCT + TAU vs. TAU: RR 1.80; 95% CI 0.77, 4.19 |
| **3 or more episodes of depression (77% of sample): Relapse in MBCT + TAU vs. TAU: RR 0.61; 95% CI 0.41, 0.89 |
| <strong>Health-related quality of life:</strong> NA |
| <strong>Adverse events:</strong> Not reported |
| <strong>Antidepressant use:</strong> MBCT: 40% TAU: 45% p=0.10 |</p>
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<th>Study Details</th>
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<th>Intervention/Treatment</th>
<th>Outcomes/Results</th>
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</table>
| **Reference:** Van Aalderen et al., 2012 | **Number of participants:** 219 initial, 205 final | **MBCT:** MBCT was delivered according to guidelines (Segal, Williams, and Teasdale, 2002) | **Depressive symptoms, HRSD17:**
| **Study design:** Single-site RCT | **Method of identifying patients with MDD:** Recurrent depression according to the Structural Clinical Interview for DSM-IV | **Dosage:** 9 sessions, 8 weekly 2.5-hour sessions and a silent day of 6 hours of meditation. Home practice 6 times a week for 45 minutes. | Full sample:
| **ITT analysis:** Yes | **Baseline depressive symptom score:** HRSD17: MBCT + TAU: 9.5 (6.2) TAU: 9.2 (5.6) | **Difference in change in depressive symptom score in MBCT + TAU vs. TAU:** SMD $\sim$0.47; 95% CI $\sim$0.75, −0.20 |
| **Purpose:** To examine the efficacy of MBCT in a representative sample of patients with recurrent depression; to examine whether MBCT was effective for patients with or without a current depressive episode; and to investigate rumination, worry, and mindfulness skills as possible mediators for the reduction of depressive symptoms in the MBCT condition | **BDI:** MBCT + TAU: 14.9 (9.2) TAU: 16.2 (9.4) | Currently depressed subgroup:
| **Country:** Netherlands | **Average age in years (SD):** MBCT: 47.3 (11.5); TAU: 47.7 (11.1) | **Difference in change in depressive symptom score in MBCT + TAU vs. TAU:** SMD $\sim$0.43; 95% CI $\sim$0.71, −0.15 |
| **Quality rating:** Poor | **Gender:** MBCT: 30% male; TAU: 28% male | **Comparator:** TAU, including antidepressants | **Depressive symptoms, BDI:**
| **Inclusion criteria:** Three or more previous depressive episodes according to DSM-IV criteria. Patients using antidepressant medication were required to be on a stable dose for at least 6 weeks and were asked to maintain this dosage for the study period. | **Follow-up:** At end of intervention | Full sample:
| **Exclusion criteria:** Any previous (hypo)manic episodes according to DSM-IV criteria; current alcohol or drug abuse; urgent need for psychiatric treatment—for example, suicidality or psychotic symptoms; problems impeding participating in a group, such as severe borderline personality disorder; problems impeding completing the questionnaires, such as cognitive dysfunctions. | **Difference in change in depressive symptom score in MBCT + TAU vs. TAU:** SMD $\sim$0.30; 95% CI $\sim$0.03, 0.25 |
| **Country:** Netherlands | **WHO Quality of Life – Brief, Physical:** | Currently depressed group:
<p>| <strong>Quality rating:</strong> Poor | <strong>Full sample:</strong> | <strong>Difference in change in depressive symptom score in MBCT + TAU vs. TAU:</strong> SMD $\sim$0.63; 95% CI $\sim$0.35, −0.91 |
| <strong>WHO Quality of Life – Brief, Psychological:</strong> | <strong>Full sample:</strong> | <strong>Response:</strong> NA |
| | <strong>Difference in change in physical HRQOL score in MBCT + TAU vs. TAU:</strong> SMD $\sim$0.38; 95% CI $\sim$0.66, −0.11 | <strong>Remission:</strong> NA |
| | <strong>Currently depressed subsample:</strong> | <strong>Relapse:</strong> NA |
| | <strong>Difference in change in physical HRQOL score in MBCT + TAU vs. TAU:</strong> SMD $\sim$0.17; 95% CI $\sim$0.44, 0.11 | <strong>WHO Quality of Life – Brief, Psychological:</strong> |
| | <strong>Full sample:</strong> | <strong>Full sample:</strong> |
| | <strong>Difference in change in psychological HRQOL score in MBCT + TAU vs. TAU:</strong> SMD $\sim$0.42; 95% CI $\sim$0.70, −0.14 | <strong>Difference in change in psychological HRQOL score in MBCT + TAU vs. TAU:</strong> SMD $\sim$0.42; 95% CI $\sim$0.70, −0.14 |</p>
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<td>Currently depressed subsample:</td>
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<td>Difference in change in psychological HRQOL score in MBCT + TAU vs. TAU:</td>
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<td>SMD $-0.49; 95% \text{ CI } -0.77, -0.21$</td>
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<td>WHO Quality of Life – Brief, Social:</td>
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<td>Full sample:</td>
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<td>Difference in change in social HRQOL score in MBCT + TAU vs. TAU:</td>
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<td>SMD $-0.09; 95% \text{ CI } -0.36, 0.18$</td>
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<td>Currently depressed subsample:</td>
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<td>Difference in change in social HRQOL score in MBCT + TAU vs. TAU:</td>
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<td></td>
<td>SMD $-0.26; 95% \text{ CI } -0.53, 0.02$</td>
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<td><strong>Adverse events:</strong> Not reported</td>
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<td><strong>Antidepressant use:</strong> NA</td>
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</table>
Reference: Williams, Crane, et al., 2014

**Study design:** Multisite RCT

**ITT analysis:** No

**Purpose:** To compare MBCT with both cognitive psychological education (CPE) and TAU in preventing relapse to MDD in people currently in remission following at least 3 previous episodes, using time to relapse to major depression as the main outcome.

**Country:** United Kingdom

**Quality rating:** Poor

**Number of participants:** 274 initial, 255 final

**Method of identifying patients with MDD:** Diagnosis of MDD currently in remission as assessed with the Structured Clinical Interview for DSM-IV.

**Baseline depressive symptom score:**
- HRSD: MBCT: 3.17 (3.61), CPE: 3.55 (3.50), TAU: 2.57 (3.47)
- BDI: MBCT: 7.72 (6.68), CPE: 8.86 (9.27), TAU: 7.05 (6.94)

**Average age in years (SD):** 43 (12)

**Gender:** 28% male

**Inclusion criteria:** Age between 18 and 70 years; history of at least three episodes of major depression meeting DSM-IV criteria, of which two must have occurred within the past 5 years, and one within the past 2 years; remission for the previous 8 weeks, with potential trial participants deemed not to be in recovery or remission, and hence ineligible, if they reported that at least 1 week during the previous 8 they experienced either a core symptom of depression (depressed mood, anhedonia) or suicidal feelings and at least one other symptom of depression, which together were not attributable to bereavement, substances, or medical condition, but were impairing functioning; informed consent from participants and their primary care physicians.

**Exclusion criteria:** History of schizophrenia, schizoaffective disorder, bipolar disorder, current abuse of alcohol or other substances, organic mental disorder, pervasive developmental delay, primary diagnosis of obsessive-compulsive disorder or eating disorder, or regular nonsuicidal self-injury; positive continuing response to CBT—that is, no relapse to MDD at the end of the intervention and 3, 6, 9, and 12 months postintervention.

**MBCT:** Manualized group skills training program (Segal, Williams, and Teasdale, 2002) that integrates psychological educational aspects of CBT for depression with mediation components of mindfulness-based stress reduction. Followed MBCT manual, except for greater emphasis on factors that might be associated with suicidal planning and actions.

**Dosage:** 8 weekly 2-hour classes, plus 2 follow-up classes

**Co-interventions:** Encouraged participants to continue current medication and attend their mental health practitioners or other services as usual during the trial (TAU)

**Comparators (2):**
- CPE: Manualized MBCT program excluding the experiential cultivation of mindfulness through meditation practice
- TAU: Not specified, but therapist stressed the importance of seeking treatment as needed

**Relapse (meeting relevant Structured Clinical Interview for DSM-IV criteria for at least 2 weeks since previous assessment):**
- Relapse in MBCT + TAU vs. TAU: RR 0.88; 95% CI 0.63, 1.22
- Relapse in MBCT + TAU vs. CPE + TAU: RR 0.93; 95% CI 0.70, 1.24

**Follow-up:** At the end of the intervention and 3, 6, 9, and 12 months postintervention

**Health-related quality of life:** NA

**Adverse events:** 15 severe adverse events were reported to the research team (MBCT=5, CPE=10).

There was only 1 "serious adverse reaction"—an episode of serious suicidal ideation following discussion of different coping responses to low mood in CPE. There were 14 overnight admissions, 13 for physical health problems and 1 following an overdose during follow-up in a patient who had received MBCT. 1 participant died from an unrelated medical condition after partially withdrawing from trial follow-up due to illness.

**Antidepressant use:** NA

**Depressive symptoms:** NA

**Response:** NA

**Remission:** NA

**Quality rating:** Poor
<table>
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<td>depression since treatment with CBT, due to the known effects of CBT in reducing risk of relapse; current psychotherapy or counseling more than once a month; regular meditation practice (meditating more than once per month); or inability to complete research assessments through difficulty with English, visual impairment, or cognitive difficulties.</td>
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NOTES: Unless otherwise noted, numbers in parentheses are standard errors. CPE = cognitive psychological education; HRQOL = health-related quality of life; m-ADM = maintenance antidepressant medication; MADRS = Montgomery-Åsberg Depression Rating Scale; NA = not available; SD = standard deviation.
References


Godfrin, K. A., and C. Van Heeringen, “The Effects of Mindfulness-Based Cognitive Therapy on Recurrence of Depressive Episodes, Mental Health, and Quality of Life: A Randomized


