

## Effects of Mindfulness-Based Cognitive Therapy on Depression and Anxiety in Late Life: A Meta-Analysis

### ABSTRACT

**Objective:** This study aims to assess the efficacy of mindfulness-based cognitive therapy (MBCT) in alleviating depression in older adults.

**Methods:** A comprehensive search was conducted in 4 electronic databases and 1 registered database from inception up to July 2021 to identify relevant trials. The meta-analysis employed Hedge's  $g$ , along with its 95% CI, and associated  $z$  and  $P$ -values for the included studies, utilizing Comprehensive Meta-Analysis software.

**Results:** Qualitative synthesis was performed on 5 eligible studies. Evaluation of methodological quality and bias risk across the papers involved scrutiny of key variables due to the heterogeneous research formats. Our findings indicated a significant moderating effect of MBCT against current depressive symptoms in older adults ( $g=0.53$ , 95% Confidence Intervals (CI) =0.31-0.75) and a similar effect size for anxiety ( $g=0.43$ , 95% CI=0.20-0.65). However, caution is warranted due to the limited number of studies and potential publication bias. Further extensive research with longer follow-up measures and larger sample sizes is essential.

**Conclusion:** This study underscores the effectiveness of MBCT as a treatment for anxiety and despair in older individuals. Mindfulness-based cognitive therapy should be recommended for its positive impact on older adults with depression, and the involvement of authorized psychiatric nurses is crucial for conducting successful MBCT interventions. However, caution is warranted due to the limited number of studies and potential publication bias. Further extensive research with longer follow-up measures and larger sample sizes is essential.

**Keywords:** Mindfulness-based cognitive therapy (MBCT), late-life depression, older adults

### Introduction

Depression represents the third leading cause of the global burden of disease, with a prevalence among older adults ranging from 4.6% to 9.3%.<sup>1</sup> Over the years, late-life depression (LLD) has become increasingly prevalent, significantly impacting the physical and mental health of older individuals and imposing a substantial economic burden on medical service systems.<sup>2</sup> Recognized as a critical global public health issue, LLD is often accompanied by comorbidities, such as hypertension, coronary heart disease, diabetes, and cognitive impairment. Importantly, LLD can hinder the prognosis of primary diseases due to reduced treatment adherence associated with depressive symptoms.<sup>3,4</sup> Clinical responses to LLD treatment with medication are often unsatisfactory, with approximately 40%-60% of patients showing responsiveness to pharmacotherapy and a notable recurrence rate. Moreover, antidepressant use during the maintenance period has limitations, including adverse effects and recurring depressive symptoms in a significant percentage of patients over a 2-year period.<sup>5-7</sup> Consequently, there is a growing demand for evidence-based, non-pharmacological treatments such as psychotherapy.<sup>8,9</sup>

Various psychological therapies, including cognitive therapy (CT), interpersonal therapy, behavioral activation therapy, and brief psychodynamic therapy, have demonstrated

Junrong Ye<sup>1\*</sup> 

Yuanxin Pan<sup>1,2\*</sup> 

Chenxin Wu<sup>1,2\*</sup> 

Zhanhua Hu<sup>3</sup> 

Shengwei Wu<sup>4</sup> 

Wen Wang<sup>1,2</sup> 

Jianxiang Guo<sup>5</sup> 

Aixiang Xiao<sup>1,2,6</sup> 

<sup>1</sup>Geriatric Neuroscience Center, Affiliated Brain Hospital of Guangzhou Medical University, Guangzhou, China

<sup>2</sup>Guangzhou Medical University, School of Nursing, Guangzhou, China

<sup>3</sup>Sun Yat-sen University, School of

Pharmaceutical Sciences, Guangzhou, China

<sup>4</sup>Department of Traditional Chinese Medicine, Affiliated Brain Hospital of Guangzhou Medical University, Guangzhou, China

<sup>5</sup>Department of Chronic Diseases, Affiliated Brain Hospital of Guangzhou Medical University, Guangzhou, China

<sup>6</sup>Department of Nursing Administration, Affiliated Brain Hospital of Guangzhou Medical University, Guangzhou, China

\*Chenxin Wu, Junrong Ye, and Yuanxin Pan are co-first author, who contributed equally to the study.

### Corresponding author:

Jianxiang Guo or Aixiang Xiao

✉ 543061910@qq.com or jxguonet01@126.com

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effectiveness in treating LLD.<sup>10,11</sup> Mindfulness-based CT (MBCT), an 8-week group training that combines mindfulness meditation techniques with elements of cognitive-behavioral therapy, has emerged as a promising approach. Mindfulness-based CT aims to help participants recognize and disengage from maladaptive cognitive patterns while fostering a nonjudgmental and compassionate attitude toward their thoughts and feelings.<sup>12</sup> As the third wave of CT, MBCT has shown great promise in reducing the relapse and recurrence of depressive episodes among individuals who have recovered from major depression. Notably, MBCT stands out from other mindfulness-based interventions (MBIs), such as mindfulness stress reduction. Theoretically, operating as a manualized therapy, MBCT has the potential to enhance patients' metacognitive awareness while mitigating cognitive and emotional rumination, thereby contributing to the amelioration of depressive symptoms.<sup>8,9</sup>

Existing meta-analyses have consistently demonstrated the feasibility of MBIs in mitigating depressive symptoms. A meta-analysis incorporating 31 randomized controlled trials with 2532 participants experiencing acute depressive symptoms revealed a mean effect size of  $-0.76$  (95% Confidence Intervals (CI),  $-0.95$ - $0.56$ ,  $P < .01$ ) for MBCT compared to individuals on a waitlist or receiving no treatment. Over time, the mean treatment effect size remained substantial at  $-0.97$  (95% CI,  $-1.68$ - $0.26$ ,  $P = .01$ ) based on 4 included studies.<sup>13</sup> Thimm et al<sup>14</sup> found that the effects of MBCT on depression, assessed using the Hamilton Depression Rating Scale or the Beck Depression Inventory (BDI), were consistently effective, with the effect size showing no moderation based on the time of publication.<sup>14</sup> Kishita et al<sup>15</sup> reported a significant moderate effect size for depression ( $g = 0.5$ , 95% CI,  $0.34$ - $0.75$ ) and a significant overall effect size for anxiety in older adults undergoing MBCT and acceptance and commitment therapy ( $g = 0.58$ , 95% CI,  $0.27$ - $0.88$ ).<sup>15</sup>

However, previous meta-analyses have predominantly focused on adults, with older adults receiving less attention. Nonetheless, there is evidence supporting the efficacy of MBCBTs, including acceptance and commitment therapy and MBCT, in treating depression in adults.<sup>15</sup> Consequently, it is reasonable to infer that MBCT could improve depressive symptoms in older adults. Existing research has demonstrated that MBCT strengthens functional and structural connections between the amygdala and the medial frontal gyrus, and this increase in communication correlates with improvements in clinical symptoms.<sup>16</sup> Summarizing research on MBCT aids in ascertaining its effectiveness and exploring further clinical promotion.

## MAIN POINTS

- Mindfulness-based cognitive therapy (MBCT) treatment of depression in the elderly is beneficial for improving their emotional health.
- Mindfulness-based cognitive therapy is effective in improving depressive symptoms in the elderly.
- Mindfulness-based cognitive therapy is effective in improving anxiety symptoms in the elderly.
- The effect of MBCT in treating depression has some implications for mental health nursing.
- The use of MBCT in nurses can improve their abilities to take care of patients with emotional disorders.

Therefore, this meta-analysis aimed to comprehend the impact of exclusively utilizing MBCT in older adults with current depression. Acknowledging the limitations of inadequate high-quality randomized controlled studies, this study also considered pre-post studies without a control group. The objective of this study was to determine whether the published research supports a call for additional studies to elucidate the effectiveness of MBCT in reducing depressive symptoms in older adults.

## Material and Methods

### Inclusion and Exclusion Criteria

The inclusion criteria were as follows: (a) participants aged  $\geq 60$  years old; (b) exclusive use of MBCT as an intervention; (c) inclusion of active or passive control for comparison; (d) examination of the effects of MBCT pre- and post-intervention for LLD; (e) peer-reviewed publication; (f) provision of sufficient information for effect size computation; and (g) publication in English. Exclusion criteria encompassed: (a) recruitment of participants diagnosed with severe physical diseases; (b) lack of examination of treatment outcomes for depression; or (c) comparison with findings from other systematic reviews or meta-analyses.

### Search Strategies

A comprehensive search was conducted in electronic databases, including PubMed (title and abstract), EBSCOhost (abstract), Scopus (title, abstracts, and keywords), and Cochrane Central Register of Controlled Trials (title, abstracts, and keywords) in July 2021. The search terms "mindfulness-based cognitive therapy" and "older adult population" were employed in PubMed, and "depression" was added to other databases for precision (Table 1). ClinicalTrials.gov was also searched for ongoing or unpublished articles, and manual searches of references from identified trials and systematic reviews were performed.

### Study Selection

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 guidelines for systematic review reporting, the initial step involved eliminating duplicates from the total number of identified records using EndNote X9. Subsequently, the abstracts of the remaining records underwent screening to identify publications eligible for full-text evaluation. The screening aimed to select research meeting the predefined inclusion criteria. This process was carried out independently by 2 authors. Any uncertainties or discrepancies in the eligibility of specific papers were resolved through a discussion with a third person to reach a consensus. Throughout the screening procedure, all relevant features of studies deemed ineligible for inclusion were comprehensively documented. The systematic review was registered at INPLASY (<https://inplasy.com>) (Registration No: INPLASY202210121).

### Data Collection Process

Eligible studies underwent coding based on the first author's name and publication year. The characteristics and findings of the enrolled studies were systematically organized and presented in Table 2. Information extracted from eligible studies included country, treatment target, sample source, participant age range, characteristics of control and intervention groups, format of MBCT, length of follow-up, measurements, outcomes, and therapist training experiences. The data extraction process was independently conducted by the

Table 1. Search Strategy

Name	Search Strategy	Number
PubMed	("mindfulness-based cognitive therapy"[Title/Abstract] OR "mindfulness based cognitive therapy"[Title/Abstract] OR "MBCT"[Title/Abstract]) AND (Elder*[Title/Abstract] OR old adults [Title/Abstract] OR aging [Title/Abstract] OR elder [Title/Abstract] OR older [Title/Abstract] OR aged [Title/Abstract] OR geriatric [Title/Abstract] OR senile [Title/Abstract] OR "late life"[Title/Abstract] OR late-life [Title/Abstract])	51
Scopus	(TITLE-ABS-KEY ({mindfulness-based cognitive therapy}) OR "mindfulness based cognitive therapy" OR MBCT) AND TITLE-ABS-KEY (depression OR depressive OR mood OR depress* OR "depressive disorder" OR "mood disorder" OR "Dysthymic disorder") AND TITLE-ABS-KEY (elder* OR "old adults" OR aging OR elder OR older OR aged OR geriatric OR senile OR "late life" OR "old* adult*")	246
EBSCOhost	(TITLE-ABS-KEY ({mindfulness-based cognitive therapy}) OR "mindfulness based cognitive therapy" OR MBCT) AND TITLE-ABS-KEY (depression OR depressive OR mood OR depress* OR "depressive disorder" OR "mood disorder" OR "Dysthymic disorder") AND TITLE-ABS-KEY (elder* OR "old adults" OR aging OR elder OR older OR aged OR geriatric OR senile OR "late life")	32
Cochrane Central Register of Controlled Trails	(TITLE-ABS-KEY ({mindfulness-based cognitive therapy}) OR "mindfulness based cognitive therapy" OR MBCT) AND TITLE-ABS-KEY (depression OR depressive OR mood OR depress* OR "depressive disorder" OR "mood disorder" OR "Dysthymic disorder") AND TITLE-ABS-KEY (elder* OR "old adults" OR aging OR elder OR older OR aged OR geriatric OR senile OR "late life" OR "old* adult*")	34
ClinicalTrials.gov	(([Condition or disease] "mindfulness based cognitive therapy") AND ([Other term] "depression"))	31

first author and subsequently passed to other authors for thorough evaluation and discussion to mitigate potential errors.

All controlled studies reporting means, Standard Deviations (SD), and sample sizes at both pretest and posttest stages were compiled. When available, data was retrieved from intent-to-treat (ITT) samples using the last observation carried forward technique. Preference was given to studies utilizing symptom-specific depression scales such as the BDI-II and the Patient Health Questionnaire-9. Additionally, studies employing broader measures of depression symptoms, such as the Depression Anxiety Stress Scales, were considered. In instances where data or other relevant information for analysis were not available, efforts were made to contact study authors for the necessary details, and papers with inaccessible data were excluded.

#### Risk of Bias Within/Across Studies

Methodological quality assessment included the following information extracted from each trial:<sup>17</sup> (a) the procedure for tracking treatment adherence; and (b) follow-up outcome assessments. In controlled trials, additional information was collected on (a) the type of data analysis, (b) research design methodology, (c) whether assessors were blinded to group allocations, and (d) whether the duration of treatment was consistent across all groups. While the quality of studies did not determine eligibility, bias potential was evaluated by the first author, reexamined by the other author, and subsequently discussed among all authors.

#### Statistical Analysis

Comprehensive Meta-Analysis (CMA) software 2.0 was employed for data analysis (National Institutes of Health, Bethesda, Maryland, USA). Effect sizes were determined using means, SDs, and sample sizes to calculate Hedge's *g*, a variant of Cohen's *d*, which adjusts for biases resulting from small sample sizes (Hedges & Olkin, 1985).<sup>17</sup> For each included study, CMA was utilized to ascertain the corresponding *z* and *P* values, along with the 95% CI. When correlations between pretreatment and posttreatment outcomes were unknown, a conservative estimate ( $r = 0.7$ ) suggested by Rosenthal (1986)<sup>18</sup> was utilized.

Heterogeneity analysis employed *Q* and *I*<sup>2</sup> indicators, where *I*<sup>2</sup> denotes the percentage of variance between studies in the population

variance (*I*<sup>2</sup> = 25%, 50%, and 75% representing low, medium, and high heterogeneity, respectively). A random-effects model was selected when the *I*<sup>2</sup> value was  $\geq 75\%$  and *Q* indicated substantial heterogeneity, and vice versa.<sup>19</sup>

To evaluate publication bias, Rosenthal's fail-safe *N* test was selected. This method involves calculating the number of missing papers that would need to be retrieved and included in the analysis to reduce the overall effect size to a non-significant level. A larger fail-safe *N* (*N*<sub>fs</sub>) suggests a lower likelihood of bias. However, if *N*<sub>fs</sub> is less than  $5k + 10$  (where *k* is the number of original studies), the possibility of publication bias cannot be ignored.

## Results

### Study Selection

The study's selection process is illustrated in Figure 1. Our search yielded 315 citations; duplicates (*n* = 50) were automatically removed, and incomplete articles (*n* = 29) on clinical trials were excluded. Subsequently, 239 articles were screened based on titles and abstracts, making 118 reports available for full-text screening. However, only 5 studies met the inclusion criteria. Two studies<sup>20,21</sup> were excluded due to unavailable data for meta-analysis, and 1 study<sup>22</sup> was included despite having participants under 65 years old, as they were caregivers for older adults. Disagreements were resolved through discussion with other authors.

### Characteristics of Included Studies

Table 2 and Table 3 present the key features of the studies incorporated into this meta-analysis. The study encompassed a cohort of 196 elderly participants engaged in mindfulness-based cognitive studies (treatment, *n* = 109; control, *n* = 65). Five studies were identified, comprising 2 controlled studies and 3 pre-post studies. Among the controlled studies, 1 employed a double-blind randomized controlled trial design utilizing treatment as usual as controls during treatment, while the other utilized a waitlist control group for comparative purposes.

The mean age of participants across the 5 studies ranged from 65 to 77 years. The primary focus of the included articles was on addressing

Table 2. Characteristic of Studies

Study Code	Country (Design)	Treatment Target	Sample	Age Range (Years) (Mean)		Control (N) <sup>c</sup>	Therapy Format	Depression Measurements	Other Measurements
				Treatment (N) <sup>c</sup>	Control (N) <sup>c</sup>				
Torres, 2019	Canada (a blind, 2-arm RCT)	LLA/LLD	5 primary care centers	≥60 (67.8)	MBCT (PP-27)	TAU(26)	Group	PHQ-9	GAD-7, EQ-5D
O'Connor, 2014	Denmark (a non-randomized, controlled pilot design)	Long-term bereavement-related distress.	The Danish Central Person Register (CPR)	65-80 (77)	MBCT (ITT-18); MBCT (PP-12)	WLC(18)	Group	BDI-II	HTQ, ICG-R; CES
Splevins, 2009	Northwest England (a pre-post within-subjects design)	Moderate levels of depression, anxiety, and stress	In response to advertisements or referral by medical staff	49-79 (65) (4 carers under 65 included reasonably)	MBCT (PP-22)	N	Group	DASS-21	KIMS
Meeten, 2015	UK (a mixed methodology study)	Older people in recovery from recurrent depression and/or experiencing mild chronic depression	Older People's Mental Health Services (OPMHS)	65-78 (71.25)	MBCT (PP-13)	N	Group	DASS-21	Ryff Well-being scale; MBCT Rating Questions
Labbé, 2016	Canada (a retrospective case series)	Acute anxiety and depression	Outpatient	66-82 (74.5)	MBCT (PP-4*)	N	Group	BDI-2	BAI; MoCA

BAI, Beck Anxiety Inventory; BDI-2, Beck Depression Inventory 2; BDI-II, The Beck Depression Inventory; CES, The Centrality of Event Scale; DASS-21, The Depression, Anxiety and Stress scales; EQ-5D, EuroQol Five Dimension Scale questionnaire; GAD-7, Generalized Anxiety Disorder-7; HTQ, The Harvard Trauma Questionnaire—Part IV; ICG-R, The Inventory of Complicated Grief—Revised; KIMS, The Kentucky Inventory of Mindfulness Skills; MBCT, mindfulness-based cognitive therapy; RCT, Randomized controlled trial; LLA, Late-life Anxiety; LLD, Late-life Depression; ITT-18, intention-to-treat-18; MoCA, Montreal Cognitive Assessment; PP, per protocol; PHQ-9, Patient Health Questionnaire-9; Ryff, The Ryff Psychological Well-being Inventory; TAU, Treat as usual; WLC, Wait-list control.

\*4 means completers who have depression scores.

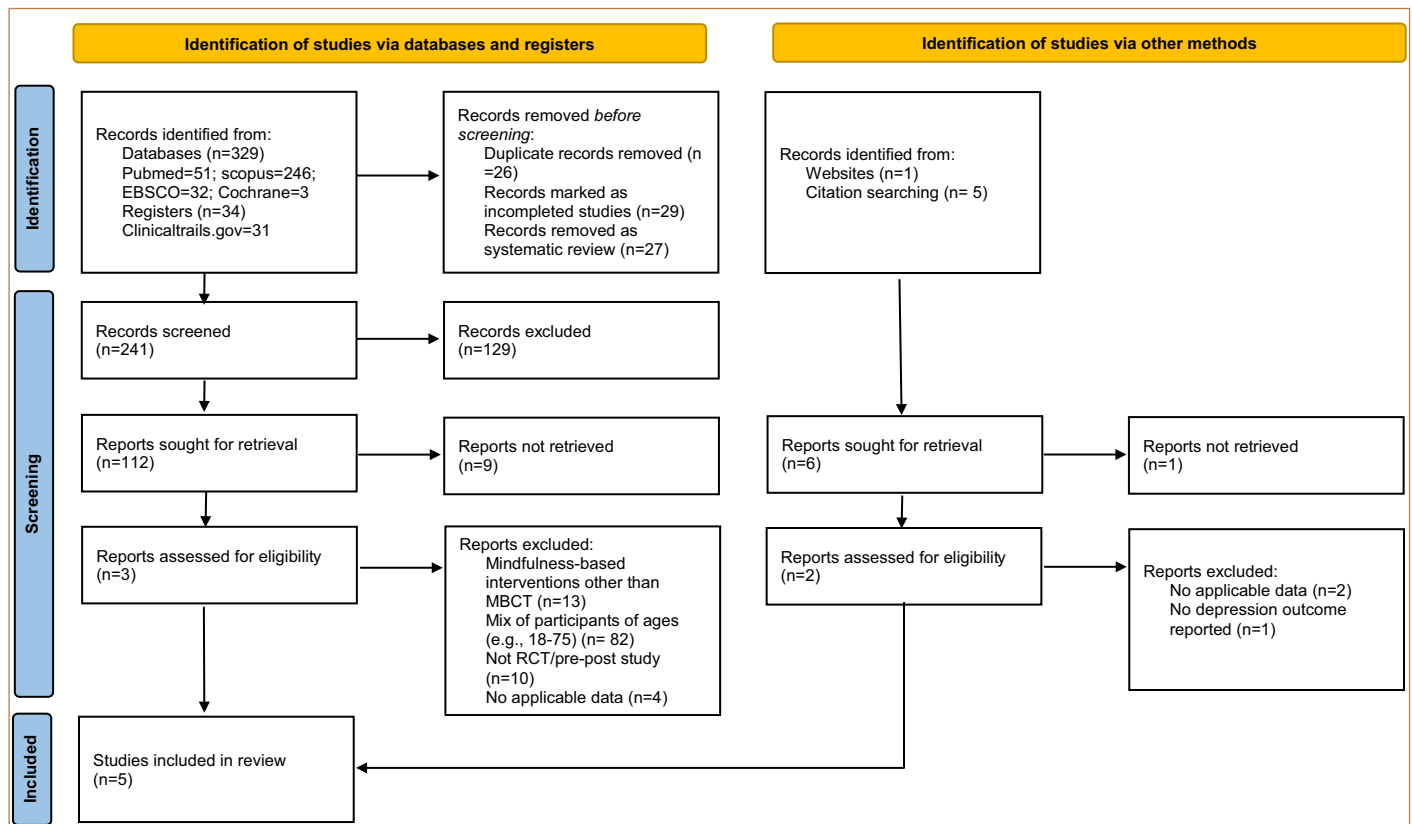


Figure 1. Flow chart. MBCT, Mindfulness-Based Cognitive Therapy; RCT, Randomized controlled trial

depressive symptoms, supplemented by consideration of other emotional indices such as anxiety or stress. Three studies measured additional indices correlated with depression, including mindfulness skills, quality of life, and cognition degree. Predominantly, studies opted for per protocol as the preferred statistical analysis, with only 1 study adopting intention-to-treat (ITT) analysis. Notably, the absence of ITT analysis resulted in a high dropout rate, exceeding 50% in 4 studies, while 1 study reported a 16% dropout rate for the depression index.

All studies uniformly employed a group format for the implementation of MBCT. Only 1 study enlisted therapists trained in geriatric psychology, while the remaining studies predominantly featured psychiatrists or other professionals with substantial experience in MBCT. Although 1 article explored participants' experiences related to cognitive behavior therapy (CBT) or meditation, no significant associations were found between gender, previous related experience, or any outcome variables. Two studies detailed specific adaptations made to the manual's recommendations to ensure suitability for older adults, such

Table 3. Therapist and Treatment Characteristics for Mindfulness-Based Cognitive Therapy Studies with Older Adults

Study Code	Number of Sessions	Training Experiences of Therapist(s) Reported		Training Experiences of Participants		Age-Specific Modifications made to the Standard Manual	Home-Practicing	Follow-Up	Remission Rate (MBCT Group)
		MBCT	Gerontology	CBT	Meditation				
Torres, 2019	2 hours x 8 weeks	YES	NO	N	N	YES, from time to requirements <sup>a</sup>	YES, 25 minutes daily	8 weeks	16%
O'connor, 2014	2 hours x 8 weeks	YES	NO	N	N	YES, reduced the practicing time from 2½ to 2 hours per session;	YES, 40 minutes a day	5 months	55%
Splevins, 2009	2 hours x 8 weeks	N	N	YES (18%)	YES (9%)	N	N	NO	50.0%
Meeten, 2015	2 hours x 8 weeks	YES	NO	N	N	YES	NO	Y, 6 months	56.3%
Labbé, 2016	2 hours x 8 weeks	YES	N	N	N	N	N	N	66.7%

<sup>a</sup>Reducing time of body scan meditation; using chairs; allowing patients to remain seated during yoga practices; encouraging patients to modify postures for safety and well-being; providing pillows; slowing down the pace of walking meditation; projecting loudly; and taking more frequent breaks.

MBCT, Mindfulness-Based Cognitive Therapy; CBT, Cognitive Behavior Therapy; Y, Yes; ITT, intent-to-treat; N, not clearly; PP, per protocol.



as adjusting session lengths, slowing down walking meditation, and encouraging participants to modify comfort postures for enhanced well-being and safety. Additionally, 2 studies reported the incorporation of home practice after group sessions, and 1 study provided insights into the effect size of MBCT practice among older adults.

**Synthesis of Results**

**Effects on Late-Life Depression:** Measurements of depressed symptoms across 5 studies yielded effect sizes ranging from “not effective” ( $g=0.18$ ) to “large and positive” ( $g=0.93$ ) (Figure 2). The fixed-effects model indicated an overall effect size of  $g=0.53$  (95% CI, 0.31-0.75), suggesting a substantial moderating effect of mindfulness-based cognitive treatment on depression symptoms in older individuals ( $z = 4.79, P < .01$ ). Low heterogeneity between study effect sizes was observed ( $Q_{(4)} = 3.56, P > 0.1; I^2 = 0$ ).

**Effects on Late-Life Anxiety:** Four studies assessing anxiety symptoms showed varying effect sizes from ineffective ( $g=0.27$ ) to large and positive ( $g=0.93$ ) (Figure 3). The fixed-effects model yielded an overall effect size of  $g=0.43$  (95% CI, 0.20-0.65), signifying a significant moderating effect of MBCT on anxiety symptoms in the elderly ( $z = 3.77, P < .01$ ). Significant moderate heterogeneity between study effect sizes was identified ( $Q_{(3)} = 4.30, P > 0.1; I^2 = 30.27$ ).

**Publication Bias**

**Studies on Late-Life Depression:** The observed effect sizes for LLD may lack robustness, as indicated by Rosenthal’s fail-safe N method,

estimating that 23 missing studies would be required before the aggregate 2-tailed  $P$ -value exceeded .05. This suggests the potential presence of publication bias, emphasizing the need for caution when interpreting findings related to depression.

**Studies on Late-Life Anxiety:** In studies on late-life anxiety, Rosenthal’s Fail-safe N approach suggested that 16 missing trials would be necessary before the combined 2-tailed  $P$ -value exceeded .05. This implies that the observed effect sizes for anxiety might not be robust, raising concerns about potential publication bias in studies related to anxiety.

**Study Quality:** Table 4 provides an assessment of the study’s quality. Notably, while most studies reported reasons for remission to explore feasibility or acceptability, participant adherence during sessions was often overlooked. High attrition bias, linked to the absence of ITT analyses, was identified in 4 out of 5 studies. Various factors, such as inconvenience due to aging or poor health, contributed to elevated attrition rates. Among the 2 studies, Meeten et al<sup>23</sup> suggested a promising impact on anxiety at follow-up but not on depression. Depression scores tended to revert to baseline levels. O’Connor et al<sup>24</sup> revealed that 29% (5 participants) in the waitlist group, and none in the intervention group, qualified as experiencing exacerbated depressive symptoms at follow-up. All studies demonstrated statistically significant small to large effects in depression from pre- to post-intervention. Torres et al (2019) did not publish their longer-term follow-up measures, but the same group presented these results in Dikaios et al<sup>21</sup>. Similarly, a main randomized controlled trial

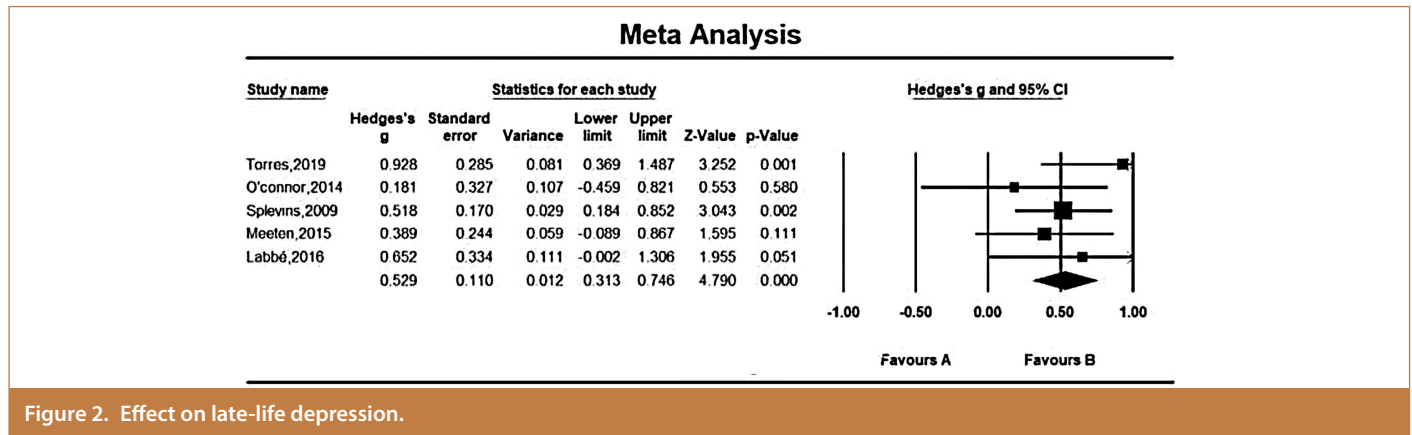


Figure 2. Effect on late-life depression.

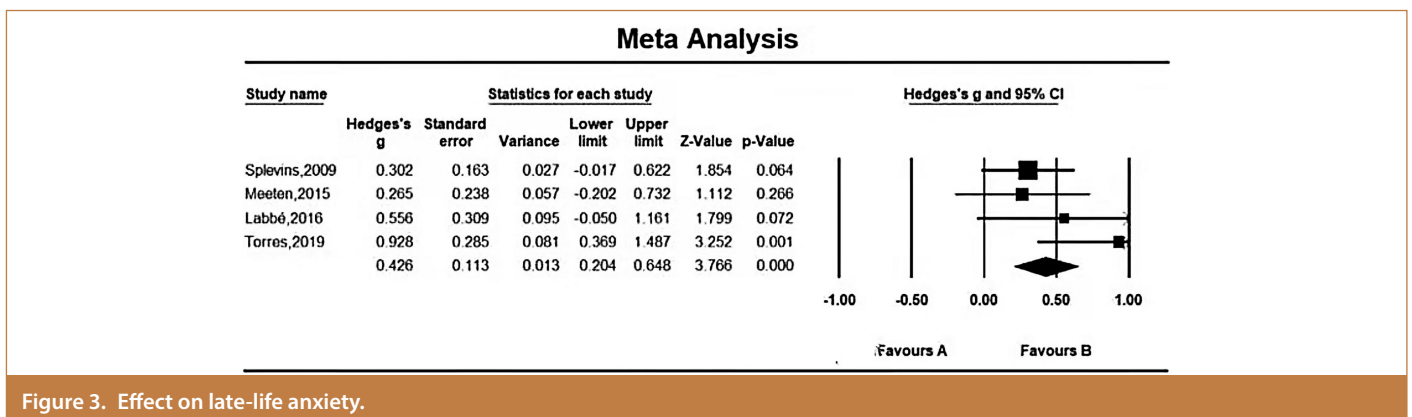


Figure 3. Effect on late-life anxiety.

**Table 4.** Study Quality Assessment

Study Code	Method of Treatment Adherence Reporting	Administration of Measures at Follow-Up	Use of Validated Mindfulness Measures	Using Intent-to-Treat Data Analyses	Randomization Method	Assessors were Blind Regarding Allocation to Group	Treatment Time was Equal Across Groups
Torres, 2019	–	–	–	+	+	+	+
O’connor, 2014	–	+	–	+	–	–	+
Splevins, 2009	–	–	+	–	NA	NA	NA
Meeten, 2015	–	+	+	–	NA	NA	NA
Labbé, 2016	?	–	–	–	NA	NA	NA

Key: present (+), absent (–), unclear (?), not applicable (NA).

paper may not report mindfulness measures, but planned secondary analyses could publish these separately in another paper.

Only 1 study employed an appropriate randomization strategy (e.g., randomization by a third party) and a blinded design (e.g., concealing group allocation from outcome assessors and investigators). The remaining studies measured only the change in scores of emotional well-being pre- and post-interventions, with a few also assessing quality of life or mindfulness ability. Moreover, none of the articles included active control groups.

## Discussion

The findings of this study suggest that adopting MBCT for treating depression in older adults holds potential benefits for enhancing their emotional well-being. We found that this approach was effective in alleviating depressive symptoms, with a total reported effect size of  $g = 0.53$  (95% CI, 0.31%–0.75%). Besides, MBCT exhibited a comparable moderating effect size for anxiety ( $g = 0.43$ , 95% CI, 0.20–0.65). These outcomes align with findings reported by Kishita et al,<sup>15</sup> who documented that mindfulness-based CBTs have a moderately effective overall effect size ( $g = 0.55$ ;  $g = 0.58$ ) for depressive or anxiety symptoms in older adults with diverse physical and psychological conditions, such as chronic pain.<sup>15</sup> However, studies included in our meta-analysis did not provide detailed information about the physical conditions of the participants. Consequently, the effectiveness of MBCT in depressed older adults with somatic diseases remains unclear. Additionally, the presence of publication bias was more prominent compared to the previous meta-analysis. This discrepancy can be attributed to variations in the design of the included studies and the likelihood that negative results were less likely to be published.

The findings of this study provide insights into mental health nursing, revealing that approximately 4.6% to 9.3% of older adults experience LLD, which may be particularly critical in low- and middle-income countries.<sup>1</sup> In recent years, mental health experts have been actively exploring treatments for LLD, while medical policymakers have been diligently working to improve public access to effective LLD treatments. Notably, in Guangdong, one of the largest provinces in China, MBCT has been incorporated into resident medical insurance since 2021.<sup>25</sup> Given the shortage of psychotherapists, mental health nurses who obtain national occupational qualifications as psychotherapists and complete MBCT training are now authorized to conduct MBCT. This policy carries 2 significant implications for mental health nursing. From the perspective of nurses, being qualified to conduct MBCT signifies an enrichment of their professionalism. As supplementary

professionals, mental health nurses authorized to perform MBCT play a crucial role in the treatment of LLD. Furthermore, MBCT, combining mindfulness training and CT, aims to assist individuals in disengaging from negative thinking by recognizing emotional deterioration without judgment or reactive responses.<sup>26</sup> From the standpoint of mental health services, educating nurses in MBCT enhances their post-competency in caring for patients with mood disorders.

Apart from the implications in the nursing field, several recommendations for future research design emerge from this study. First, researchers should be encouraged to conduct randomized controlled trials (RCTs) with ITT analysis to analyze data or explore other types of psychotherapy compared to MBCT in quasi-experimental studies. Second, enhancing study quality could involve researchers incorporating measures of adherence and monitoring adverse events throughout the intervention process, along with including additional relevant outcome measures. Last but not least, future studies should investigate factors that might influence treatment outcomes in older adults, such as the duration of the sessions, the components of the intervention, and other physical health considerations.

A notable strength of the current study is its provision of preliminary support for MBCT in the context of LLD. Despite the majority of participants experiencing depression, with only a few in recovery from recurrent depression and 4 under the age of 65, the study's findings highlight the immediate positive impact of MBCT on depressive symptoms in older adults. However, it is crucial to acknowledge certain limitations of this study. Firstly, due to the current scarcity of relevant RCTs, this meta-analysis focuses on only 1 RCT, with the included studies primarily employing pre- and post-designs and 1 study being a retrospective case series, potentially introducing recall bias. Secondly, insufficient data were available to assess the long-term effects of the MBCT approach in this meta-analysis, leaving uncertainty about the duration of MBCT effects. Despite these limitations and a relatively small sample size, this study provides valuable insights and suggests adaptations and developments for future research.

## Conclusion

Our study demonstrates the efficacy of MBCT as a viable approach for reducing depressive symptoms and improving the well-being of older adults. To our knowledge, this is the first meta-analysis focusing on the impact of MBCT among older adults aged over 65 years with depression. In summary, our findings provide compelling evidence that mindfulness training serves as an effective treatment for a range

of issues affecting older adults, including depression, anxiety, chronic pain, loneliness, and caregiver stress.<sup>27</sup> Future studies could benefit from exploring the specific role of MBCT and its value in the treatment of depression among older adults.

**Availability of Data and Materials:** All data points generated or analyzed during this study are included in this article, and there are no further underlying data necessary to reproduce the results.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – J.Y., Z.H., A.X.; Design – J.Y., A.X.; Supervision – J.G., A.X.; Resources – A.X., J.G.; Materials – J.Y., Y.P., C.W.; Data Collection and/or Processing – C.W., Y.P., S.W., W.W.; Analysis and/or Interpretation – J.Y., J.G.; Literature Search – C.W., Y.P.; Writing – J.Y., Y.P., C.W.; Critical Review – Z.H., S.W., J.G., A.X.

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## References

- Luppa M, Sikorski C, Luck T, et al. Age- and gender-specific prevalence of depression in latest-life--systematic review and meta-analysis. *J Affect Disord*. 2012;136(3):212-221. [\[CrossRef\]](#)
- McCrone P, Dhanasiri S, Patel A, Knapp M, Lawton-Smith S. *Paying the Price: The Cost of Mental Health Care in England to 2026*. London, UK: King's Fund; 2008.
- Alexopoulos GS. Depression in the elderly. *Lancet*. 2005;365(9475):1961-1970. [\[CrossRef\]](#)
- Celano CM, Villegas AC, Albanese AM, Gaggin HK, Huffman JC. Depression and anxiety in heart failure: a review. *Harv Rev Psychiatry*. 2018;26(4):175-184. [\[CrossRef\]](#)
- Almeida OP. Prevention of depression in older age. *Maturitas*. 2014;79(2):136-141. [\[CrossRef\]](#)
- Reynolds CF, 3RD, Dew MA, Pollock BG, et al. Maintenance treatment of major depression in old age. *N Engl J Med*. 2006;354(11):1130-1138. [\[CrossRef\]](#)
- Macqueen G, Santaguida P, Keshavarz H, et al. Systematic review of clinical practice guidelines for failed antidepressant treatment response in major depressive disorder, Dysthymia, and subthreshold depression in adults. *Can J Psychiatry Rev Canadienne Psychiatr*. 2017;62(1):11-23. [\[CrossRef\]](#)
- Kok RM, Reynolds CF, 3RD. Management of depression in older adults: a review. *JAMA*. 2017;317(20):2114-2122. [\[CrossRef\]](#)
- Gu J, Strauss C, Bond R, Cavanagh K. How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clin Psychol Rev*. 2015;37:1-12. [\[CrossRef\]](#)
- Orgeta V, Brede J, Livingston G. Behavioural activation for depression in older people: systematic review and meta-analysis. *Br J Psychiatry*. 2017;211(5):274-279. [\[CrossRef\]](#)
- Cuijpers P, Karyotaki E, Eckshtain D, et al. Psychotherapy for depression across different age groups: A systematic review and meta-analysis. *JAMA Psychiatry*. 2020;77(7):694-702. [\[CrossRef\]](#)
- Cladder-Micus MB, Speckens AEM, Vrijzen JN, T Donders AR, Becker ES, Spijker J. Mindfulness-based cognitive therapy for patients with chronic, treatment-resistant depression: A pragmatic randomized controlled trial. *Depress Anxiety*. 2018;35(10):914-924. [\[CrossRef\]](#)
- Lenz AS, Hall J, Bailey Smith L. Meta-analysis of group mindfulness-based cognitive therapy for decreasing symptoms of acute depression. *J Spec Group Work*. 2016;41(1):44-70. [\[CrossRef\]](#)
- Thimm JC, Johnsen TJ. Time trends in the effects of mindfulness-based cognitive therapy for depression: A meta-analysis. *Scand J Psychol*. 2020;61(4):582-591. [\[CrossRef\]](#)
- Kishita N, Takei Y, Stewart I. A meta-analysis of third wave mindfulness-based cognitive behavioral therapies for older people. *Int J Geriatr Psychiatry*. 2017;32(12):1352-1361. [\[CrossRef\]](#)
- Li H, Yan W, Wang Q, et al. Mindfulness-based cognitive therapy regulates brain connectivity in patients with late-life depression. *Front Psychiatry*. 2022;13:841461. [\[CrossRef\]](#)
- Vøllestad J, Nielsen MB, Nielsen GH. Mindfulness- and acceptance-based interventions for anxiety disorders: a systematic review and meta-analysis. *Br J Clin Psychol*. 2012;51(3):239-260. [\[CrossRef\]](#)
- Rosenthal R. Meta-analytic procedures for social science research. *Educ Res*. 1986;15:18.
- Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ (Clin Res Ed)*. 2003;327(7414):557-560. [\[CrossRef\]](#)
- Foulk MA, Ingersoll-Dayton B, Kavanagh J, Robinson E, Kales HC. Mindfulness-based cognitive therapy with older adults: an exploratory study. *J Gerontol Soc Work*. 2014;57(5):498-520. [\[CrossRef\]](#)
- Dikaios E, Escobar S, Nassim M, Su CL, Torres-Platas SG, Rej S. Continuation Sessions of Mindfulness-Based Cognitive Therapy (MBCT-C) vs. Treatment as usual in late-life depression and anxiety: an open-label extension study. *Int J Geriatr Psychiatry Continuation Sessions of Mindfulness-Based Cognitive Therapy (MBCT-C) vs.* 2020;35(10):1228-1232. [\[CrossRef\]](#)
- Splevins K, Smith A, Simpson J. Do improvements in emotional distress correlate with becoming more mindful? A study of older adults. *Aging Ment Health*. 2009;13(3):328-335. [\[CrossRef\]](#)
- Meeten F, Whiting S, Williams CM. An exploratory study of group mindfulness-based cognitive therapy for older people with depression. *Mindfulness*. 2015;6(3):467-474. [\[CrossRef\]](#)
- O'Connor T. How to set up, run and evaluate a training program based on behavior modeling principles. *Training*. 1979;16(1):64-67.
- Bureau GMS. *Basic Medical Insurance, Industrial Injury Insurance and Maternity Insurance in Guangdong Province Catalogue of Diagnosis and Treatment Projects* (in Chinese); 2021.
- Hofmann SG, Gómez AF. Mindfulness-based interventions for anxiety and depression. *Psychiatr Clin North Am*. 2017;40(4):739-749.
- Jeanne M, Sorrell PRN FAAN. Meditation for older adult- a new look at an ancient intervention for mental health. *J Psychosoc Nurs*. 2015;53(5):15-19.