

Review of Research Progress and Controversy of MBCT, MBSR and Other Mindfulness Interventions in a Variety of Psychological Disorders

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Abstract. With the rising global burden of psychological disorders, traditional interventions show limitations in supporting psychological well-being. Mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) have become a respected, comprehensive, non-pharmacological approach that emphasises self-regulation and sustainable mental health. This review synthesises high-quality randomised controlled trial evidence on the efficacy of MBCT and MBSR in physical and psychological symptoms. Theoretical mechanisms are examined across cognitive, emotional, and neurocognitive levels, highlighting decentering, attention regulation, and emotional acceptance as core transdiagnostic processes. Evidence indicates that MBCT demonstrates robust preventive effects in recurrent depression, while MBSR shows consistent benefits for anxiety and stress-related conditions. However, the contribution of such therapies to non-specific factors, such as long-term maintenance effects, responses to specific diseases, and group support and treatment expectations, remains controversial. By critically discussing the methodological challenges, including heterogeneous interventions, limited active control conditions, and cultural propulsivity, future research directions may include long-term follow-up, mechanism-focused design, biomarker integration, and precision-oriented and digital mindfulness interventions. Overall, Mindfulness-Based Intervention stands as a promising and scalable approach to improve the long-term mental well-being of individuals with the disease, and additional rigorous research is required to elucidate its mechanisms and refine clinical implementation.

1 Introduction

With the continuous increase in the incidence of psychological disorders, traditional intervention models based on drug treatment and cognitive behavioural therapy are gradually showing limitations, prompting researchers to explore more comprehensive and sustainable psychological intervention methods, emphasising self-regulation and well-being. Encourage

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researchers to explore more comprehensive and sustainable psychological intervention methods that emphasise self-regulation and wellness. Mindfulness originates from the Buddhist meditation tradition, which emphasises the understanding and acceptance of the present. Its core concept developed into a series of structured psychological intervention programs.

Among them, Mindfulness-Based Stress Reduction (MBSR) was initially used to address chronic stress and physical and mental symptoms, and later expanded into the field of psychological disorders. Mindfulness-Based Cognitive Therapy (MBCT) systematically integrates the theoretical assumptions about depressive recurrence in cognitive behavioural therapy based on MBSR, which is mainly used for the prevention of recurrent depression [1]. These two intervention models constitute the core of contemporary mindfulness intervention research and practice.

From the perspective of public health, psychological disorders have become an important part of the global burden of disease. Depression and anxiety have a high incidence and a high recurrence rate worldwide and cause serious dysfunction in patients. At the same time, physical and mental diseases such as chronic pain are often accompanied by severe psychological pain, further aggravating the social and medical burden [2]. Against this background, non-conscious intervention is seen as a potential public health strategy due to its self-regulation, non-drug methods, and scalability.

In recent years, although numerous randomised controlled trials (RCTs) and systematic reviews have assessed the effectiveness of mindfulness-based interventions, inconsistencies in the findings remain [3]. Therefore, it is necessary and meaningful to systematically review the research progress, action mechanisms and controversies of mindfulness interventions for different psychological disorders within a rigorous evidence-based framework.

This review aims to focus on high-quality RCT evidence on the efficacy of MBCT and MBSR compare their cross-disorder applications; and discuss the central controversies in current research regarding mechanism interpretation and methodology.

2 Overview of the theoretical mechanism of mindfulness intervention

Mindfulness-based interventions (MBIs) have been widely adopted in contemporary psychotherapy and have increasingly attracted scholarly attention regarding their underlying mechanisms of action. The three-factor model of mindfulness proposed by Shapiro et al. provides a systematic framework for understanding the psychological mechanisms of mindfulness interventions, emphasising that mindfulness is not a single technique but comprises core components, multiple interactions, and their derivative processes [4].

Current theories typically suggest that the core elements of mindfulness encompass present-moment awareness and a non-judgmental attitude of acceptance [4]. Present awareness refers to the individual's conscious focus on current internal and external experiences, rather than falling into automatic rumination or worry. Non-judgmental acceptance emphasises treating experience with openness and curiosity rather than evaluation or avoidance. This attitude is believed to help break the emotional reactive cycle, so that individuals no longer immediately respond defensively to uncomfortable experiences.

At the cognitive level, mindfulness interventions enhance the individual's ability to control cognitive resources through attention regulation, making it easier to perceive the flow of attention and actively return it to the present [5]. The improvement of this ability is believed to weaken the maintenance of negative thinking and rumination in mood disorders.

At the emotional level, mindfulness training emphasises observing and tolerating emotions rather than suppressing or avoiding them, thereby fostering greater emotional flexibility. Teasdale et al. proposed that mindfulness exerts its therapeutic effects primarily

by enhancing metacognitive awareness [1]. That is, individuals can realise that ideas are just psychological events, not an accurate reflection of reality. This decentering ability is considered to be a key mechanism for reducing emotional susceptibility across depressive and anxiety disorders.

At the neurocognitive level, mindfulness training has been associated with reduced activity in the default mode network (DMN) and enhanced prefrontal regulation of limbic regions, such as the amygdala [6]. These neurological changes are considered to reflect the more effective adjustment of the self-reference processing process. They may constitute the neural basis for the lasting clinical benefits of mindfulness practice, thereby supporting its maintenance of efficacy to some extent.

Although MBCT and MBSR differ in intervention targets and clinical populations, they share fundamentally similar psychological mechanisms. MBCT systematically integrates the theory of depression recurrence in cognitive behavioural therapy based on MBSR, emphasising the awareness and decentralisation of negative automatic thinking [1]. The evidence from the systematic review shows that the two types of interventions are highly consistent in their mechanisms of action, and the main differences are more reflected in clinical application contexts and treatment focus, rather than in the essence of the underlying psychological process [6].

In summary, the mechanisms of mindfulness intervention at the cognitive, emotional, and neurocognitive levels show clear convergence, pointing to the core cross-diagnostic process of decentralisation. This process enables individuals to withdraw from the uncomfortable self-reference processing mode and the automated emotional response, thereby achieving more flexible psychological adjustment. The resulting integrated mechanism provides an intrinsically consistent explanation framework for understanding the cross-diagnostic treatment effect of mindfulness-based intervention (MBI) in mood disorders and anxiety disorders.

3 Research progress and controversy of MBCT and MBSR in specific psychological disorders

3.1 Depression

3.1.1 Overview of major RCT evidence

Among psychological disorders, depression represents the clinical area with the strongest empirical support for MBCT. Teasdale et al. found in a landmark RCTs that MBCT can significantly reduce the risk of recurrence in those with a history of recurrent depression, defined as three or more episodes [7]. Since then, many RCTs have repeatedly confirmed the conclusion and gradually increased sample sizes. Subsequent randomised controlled trials conducted across diverse clinical settings and populations have consistently replicated these findings and progressively expanded sample sizes.

The large, multicenter RCT directly compared MBCT with maintenance antidepressant treatment [8]. The results showed that the two interventions were equally effective in preventing the recurrence of depression. This study provides strong evidence for MBCT as an alternative to drug-sustained treatment and significantly enhances MBCT's position in the evidence-based medical system.

3.1.2 Risk Reduction of Recurrence and Residual Symptom Improvement

The evidence consistently suggests that MBCT's primary clinical value lies not in acute symptom reduction, but in modifying vulnerability processes associated with depressive relapse [9]. In addition, MBCT can also effectively improve residual symptoms, such as rumination tendency, emotional reaction and cognitive rigidity, which are themselves essential predictors for depression recurrence. By enhancing metacognitive awareness, MBCT may enable individuals to alter their relationship with negative thoughts, thereby reducing the emotional impact of maladaptive cognitive patterns.

3.1.3 Controversial points and limitations

Although the short- and medium-term efficacy of MBCT has been consistently supported, its maintenance effect remains controversial. Some studies suggest that the intervention's effect may weaken over time, especially as the frequency of mindfulness exercises decreases. In addition, there are differences in the applicability of MBCT to different severities of depression. Its effect on mild, moderate and recurrent depression is the most stable, while the evidence of its efficacy on patients with severe acute depression is limited [8].

Methodologically, a notable limitation of the existing literature is the frequent reliance on waitlist or treatment-as-usual control conditions. Some studies use the waiting list or routine treatment as a control condition, which may overestimate the specific effect of the intervention.

3.2 Anxiety disorder: generalised anxiety and social anxiety

Kabat-Zinn et al. first found through clinical research that MBSR can significantly reduce the anxiety level of patients with anxiety disorders [9]. Subsequently, Hoge et al. carried out an RCT in patients with generalised anxiety disorder, and found that mindfulness meditation significantly influences anxiety symptoms and improves functional impairment [10].

In social anxiety disorder, Goldin et al. compared group-based CBT with MBSR and found that both interventions produced comparable improvements in anxiety symptom severity and functional outcomes. However, the authors highlighted distinct mechanisms of change: CBT primarily targets maladaptive cognitions and avoidance behaviours, whereas MBSR emphasises emotional acceptance and altered self-referential processing.

In general, both MBSR and MBCT have been proven to alleviate anxiety symptoms and improve an individual's quality of life effectively. Existing studies further indicate that mindfulness-based interventions have distinct mechanistic advantages in reducing emotional avoidance, enhancing emotional acceptance, and improving self-awareness. In contrast, cognitive behavioural therapy (CBT) mainly focuses on cognitive reconditioning and behavioural exposure, which are the core treatment strategies for changing maladaptive cognitive and behavioural patterns.

The current research controversy centres on whether mindfulness intervention is significantly more effective than non-specific psychological support. Some studies suggest that the observed therapeutic effects may, to some extent, stem from common therapeutic factors, such as group support and treatment expectations, rather than the mindfulness-specific mechanism itself. In addition, different anxiety disorder subtypes also have different responses to mindfulness interventions, among which patients with extensive anxiety disorders may get more significant benefits than patients with fear-related disorders [10].

Evidence further indicates that treatment outcomes are strongly influenced by intervention dose and adherence to home practice. However, maintaining high-frequency

mindfulness practice poses substantial challenges in real clinical settings, which may constrain the effectiveness and broader dissemination of MBIs.

4 Cross-disorder comparison: similarities and differences in intervention effectiveness and mechanisms

4.1 Comparison of therapeutic effects in different psychological disorders

Systematic review from the perspective of cross-disciplines show that mindfulness-based intervention (MBI) generally has a moderate effect in alleviating psychological symptoms related to depression, anxiety and chronic pain. Still, its therapeutic effect varies between different diseases. In general, mindfulness cognitive therapy (MBCT) has shown a particularly significant and stable effect in the prevention of recurrent depression, which is not only reflected in the results of follow-up visits, but also in the continuous reduction of cognitive vulnerability associated with relapse. In contrast, the effect of MBSR on anxiety symptoms and chronic pain-related psychological distress shows higher consistency among different studies.

4.2 Consistency and differences in treatment mechanisms

Although there are differences in the clinical manifestations of mindfulness interventions across different diseases, its potential mechanisms still show a certain degree of cross-diagnostic consistency, especially in key processes such as emotional regulation, attention control, and decentralisation. It is generally believed that the improvement of emotional regulation ability constitutes the core mechanism of mindfulness intervention in depression and anxiety. In contrast, attention regulation and physical awareness may play a more fundamental role in chronic pain and physical and mental diseases. This model shows that mindfulness-based intervention may have differentiated effects on various obstacles through distinct configurations of sharing mechanisms and obstacle-specific mechanisms, thereby highlighting the importance of customising interventions based on the action mechanism.

4.3 Common controversy: non-specific factors and specific mechanisms

In cross-disability studies, a key ongoing controversy is the extent to which the therapeutic effect of mindfulness-based interventions comes from specific psychological mechanisms rather than non-specific treatment factors (e.g., group support, treatment expectations or therapist effects). Because it is difficult to achieve a strict double-blind design in practice for mindfulness interventions, this methodological limitation makes it particularly difficult to distinguish between specific mechanism effects and common therapeutic factors, and it is common in studies of different obstacles. Therefore, how to effectively analyse and distinguish these sources of action under the framework of cross-hurdles has become one of the core challenges facing contemporary mechanism-oriented research.

5 Methodological considerations and controversies

5.1 Research on design-level problems

The research on mindfulness intervention faces many methodological challenges. Among them, it is particularly difficult to establish active control conditions that match the time and

intensity of the intervention in practice. Because of this limitation, many studies still use a standby list or routine treatment as a control, and such control designs may, to some extent, overestimate the true efficacy of the intervention. Secondly, the reporting of randomisation procedures, assessor blinding, and outcome assessment bias is insufficient in some studies, affecting the reliability of the research conclusions.

5.2 Sample-related questions

The sample size and subject selection bias are also important limitations in mindfulness research. On the one hand, small sample studies are still common in the field of mindfulness, which limits the statistical power; on the other hand, most of the subjects are voluntary participants and mainly have Western cultural backgrounds; most of the subjects are voluntary participants and mainly have Western cultural backgrounds, which may affect external validity and limit the generalisability of findings across cultural and diagnostic contexts, which may affect the external validity and cultural universality of the results.

However, the efficacy of these digital intervention models and participants' compliance still need to be verified through high-quality randomised controlled trials, and key methodological issues (e.g., the selection of a control condition and compliance maintenance), need to be further addressed. Finally, cultural sensitivity should also be considered an important factor in promoting the implementation of MBIs, as individuals' cultural beliefs and value systems may deeply affect their acceptance and participation in mindfulness practice.

6 Conclusion

This review systematically examines MBIs, focusing on the application of MBCT and MBSR in depression, anxiety and related psychological and physical diseases. Overall, cumulative evidence from randomised controlled trials and meta-analysis shows that mindfulness-based intervention is an effective and clinically significant treatment method, especially in decreasing the risk of recurrence of recurrent depression and alleviating anxiety and stress-related symptoms. Its emphasis on self-regulation ability, non-drug active participation and psychological skills cultivation is highly consistent with the core goal of mental health maintenance.

From a mechanistic perspective, the research findings across the cognitive, emotional, and neurocognitive levels are gradually converging, pointing to a core cross-diagnostic process of decentralisation. By enhancing current awareness, emotional acceptance, and metacognitive awareness, mindfulness intervention can help individuals move away from the uncomfortable self-referential processing mode and automated emotional responses. Although there are differences between MBCT and MBSR in clinical objectives and application contexts, they are highly consistent in their basic mechanisms of action, suggesting that their therapeutic effects primarily arise from shared psychological processes rather than relying solely on specific disease-oriented technical components.

Although the above evidence demonstrates the multifaceted advantages of mindfulness interventions, some important limitations remain. Methodological problems such as insufficient effective control conditions, heterogeneity of interventions, limited follow-up data, and sample heterogeneity limit the interpretability and external generalisability of existing research conclusions to a certain extent. In addition, the ongoing debate over the relative contributions of mindfulness-specific mechanisms and non-specific treatment factors has further highlighted the need for more rigorous, mechanism-oriented research and design.

Future research should prioritise promoting systematic investigation in long-term longitudinal and cross-cultural contexts, integrating biological and behavioural indicators,

and developing a mindfulness intervention model oriented towards precision and digital delivery. Effectively addressing the above challenges is crucial to consolidating the evidence base and to giving full play to the value of mindfulness-based interventions as a sustainable and scalable strategy within the modern mental health service system.

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