

Impact of Mindfulness Meditation on Craving Control and Sleep Quality among Individuals with Substance Use Disorders: A Systematic Review

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Abstract

Substance use disorders (SUDs) are often associated with patients' experiencing cravings, risk of relapse and poor sleep quality, all of which significantly affect their chance of recovery. In the present research, a systematic review has been used to evaluate the effectiveness of mindfulness-based interventions (MBIs) in reducing substance cravings and improving sleep quality among clients with substance abuse. PRISMA guidelines have been followed, and a structured search has been carried out across all major databases to identify 290 records. Inclusion and exclusion criteria have been maintained for selecting a total of 18 articles published between the year 2017 and 2026. The findings of the research have indicated the significant impact of MBIs in reducing craving levels, better emotional regulation and enhanced sleep. A number of studies in the research have also shown neurocognitive improvements and higher relapse prevention among patients who received the MBI treatment. Overall, MBIs demonstrate strong potential as a complementary approach in addiction treatment, though further standardised and longitudinal research is required.

Keywords

Craving, drug addiction, mindfulness therapy, rehabilitation centre, sleep disturbances, substance abuse.

INTRODUCTION

Substance use disorders (SUDs) are a significant global public health concern that affects individuals' mental health, causes economic, social and legal problems, further impacting the individual, their families and society as a whole. While drug addiction has been a problem for several years, the increase in drug trafficking has led to the spread of substance abuse among adolescents and teens at an alarming rate [1]. Evidence shows there exists a strong link between cravings and the use of illegal substances. Cravings are one of the major reasons behind an individual's relapse and a cause of sleep difficulties. Cravings are known for negatively impacting sleep, as individuals experience decreased willpower due to lack of sleep, they find it hard to resist temptation, and it pushes them closer to relapse [2]. Drug abuse is linked to a reduction of sleep latency, duration and quality, and with continued use, these problems become more severe, leading to abstinence, insomnia and other negative effects [3]. Sleep impairments further lead to other cognitive dysfunctions among addicted individuals.

The problems of substance abuse and drug addiction are usually addressed through rehabilitation, and rehabilitation centres are therefore important for improving the medical and socio-economic conditions of clients with addiction. While the treatment process differs according to the addiction, the process generally involves detoxification, rehabilitation and recovery [4]. Studies have shown that interventions for SUDs

are necessary, as without any form of support, patients are more likely to continue their compulsive drug use. Involvement of family is considered a positive aspect in this regard, as it supports a journey of recovery and self-discovery [5]. In recent years, mindfulness-based interventions (MBIs) have gained increasing attention as a complementary therapeutic approach in addiction treatment. MBI-based treatments have been proven to be successful across the board as studies show them to reduce dependence on drugs, cravings and other symptoms; they are also known for improving depression, anxiety and stress. The combination of MBI with treatment, therefore, has a significant impact on patients, and it is thus necessary to ensure awareness and acceptance of both results among individuals [6]. The aim of the present research is therefore to critically examine empirical studies published within the last decade to assess the impact of MBIs on substance cravings and sleep quality among individuals with SUDs.

METHODS

The present research has adopted a systematic review approach in order to evaluate the effectiveness of MBIs in reducing cravings and improving sleep among addicted individuals. The review has been conducted by following established systematic review guidelines [7]. The "Preferred Reporting Items for Systematic Reviews and Meta-analyses" (PRISMA) guidelines have been followed for systematic data extraction, providing detailed accounts of every step. A

comprehensive literature search was conducted across multiple electronic academic databases, this includes database such as “Web of Science, PubMed, Scopus and Google Scholar.” The goal of the search has been to identify articles that are peer-reviewed and have been published within the last ten years (2017-2026). This has been done to ensure that only recently published articles are included, and those that are relevant to the research. Keywords and MESH terms have been used to refine the search, such as: “mindfulness meditation,” “mindfulness-based intervention,” “substance use disorder,” “addiction,” “cravings,” and “sleep quality.” Additional filters have been used in the following PRISMA to ensure only articles that have been published in English are included. The results have found that mindfulness interventions have been applied in a wide range of addictions, including both drug and substance abuse, but the studies have not always linked the findings with cravings and sleep disturbances. The initial search resulted in a total of 290 records, which were manually evaluated to remove duplicates.

After the initial identification process, all of the duplicate articles were removed, resulting in a total of 250 unique

articles. Title and abstract screening were then carried out on the articles in order to identify the relevance of the articles and their research objectives. Articles that were published before 2017 or written in languages other than English were eliminated at this stage, and a total of 200 records were screened, while 110 articles were removed due to lack of relevance. The remaining 90 articles were assessed against predefined eligibility criteria; studies were included if they investigated MBI or other interventions, focused on individuals who have been suffering from SUD or substance abuse in general and employed empirical research designs for the research outcomes. However, articles that did not directly focus on addiction were eliminated (n=15), articles not assess cravings or sleep disturbances were also removed (n=25). Articles not including MBIs were removed (n=10), articles that were only reviews and not primary were removed (n=5), and finally articles that did not have measurable results were also removed (n=10). Following this process, a final total of 18 studies were found to be eligible for the systematic review. The structured methodological approach helps in maintaining transparency of the findings and a reliable synthesis of MBI treatments for substance abuse individuals.

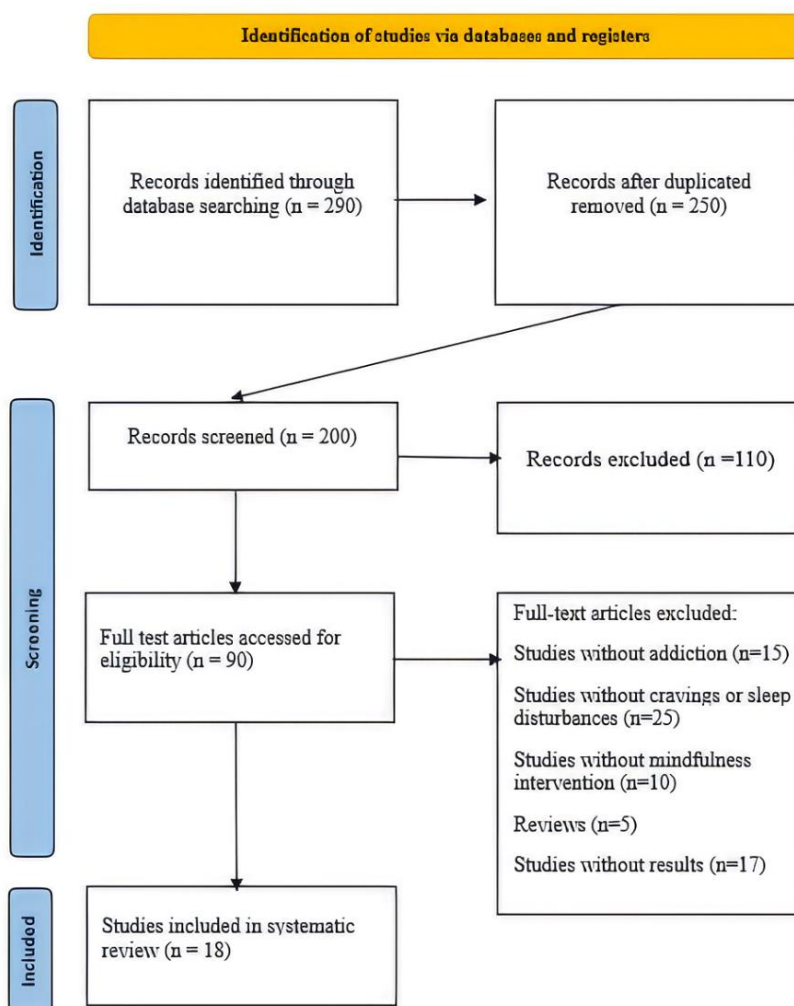


Figure 1. PRISMA Table
(Source: Self-developed)

FINDINGS

Table 1. Systematic Review

Source	Objectives	Findings	Significance	Methodology Used
[8]	The purpose of the research has been to evaluate the impact of MBI on patents with SUDs and test whether it has considerable clinical effects.	The findings of the research show SUD patients who have received MBIs have experienced a significant change in their distress tolerance levels. Higher brain function in the prefrontal cortex has also been found among patients receiving MBI compared to those on normal treatment.	The findings of the research are significant as it shows the important role which MBI has in SUD treatment. The study has found that mindfulness reduces cravings.	Structural magnetic resonance imaging data of a total of 19 patients were gathered before and after 4 weeks of treatment.
[9]	The objective of the research has been to test the ability of MBIs in decreasing the cravings of people suffering from substance abuse in rehabilitation centres.	The findings of the research have shown that the use of MBIs has significantly decreased cravings among the participants and a high mindfulness score compared to the participants who did not receive MBIs as part of their treatment.	The study makes significant contributions by showing how MBIs help reduce cravings and improve the rehabilitation process of the patients.	50 participants have been selected for the research, 25 being in the controlled group receiving rehabilitation centre treatment and 25 MBI-focused treatment.
[10]	The study aimed to determine the impact of mindfulness treatment on racially and ethnically diverse women and its ability to reduce the relapse rate among SUD recovery patients.	The findings of the research show that when MBI treatment is combined with residential treatment, patients experience higher relapse prevention. The development of mindfulness skills helps with increasing awareness and acceptance of these women. Mindfulness training has also been found to reduce the urge using substance.	The findings of the study are significant as it has particularly prioritised women in the POC category. The findings of the research are also far more accurate as it has observed the participants for over a period of 8 months.	An RCT-based method has been used with 30 participants to track patients for up to 8 months; 15 received normal SUD prevent treamtmet provided by the facility, while the other 15 received SUD with mindfulness interventions.
[11]	The objective of the research has been to test the success rate of the MMWR treatment method, which is a form of MBI, on women in residential treatment for SUD.	The findings showcase that while both groups that received SUD treatment in the long run, the ones that received MMWR had improved mindfulness, better distress tolerance and positive affect scores.	The findings are significant as patients who received MBI treatments showed higher psychological flexibility and lower substance craving scores.	A sample size of 200 females, with 100 being in the control group and the other 100 in the experimental group.
[12]	The research has aimed to improve the mindfulness-based relapse prevention (MBRP) method for individuals suffering from alcohol abuse and substance use.	The findings of the research show patients actively using the MBI skills that they have learned in their everyday activities to address their cigarette and alcohol goals. The results show growth among the participants as they had positive feedback about the treatment.	The research makes contributions by using MBI treatments on individuals trying to overcome their cigarette and alcohol consumption.	The research was initially carried out with a pilot study with 21 participants, followed by an RCT with 64 participants.
[13]	The objective of this research has been to examine the potential of using the MBRP outpatient treatment for SUD among vulnerable communities of Brazil.	Despite initial misperceptions, the findings of the research have shown people to positively accept the mental health benefits MBRP provides. Health outcomes have been shown to include fewer cravings, traits of mindfulness and self-compassion.	The findings of the research are significant as it has emphasised the need for integrating MBI in the public healthcare system to provide vulnerable people with cost-benefit treatment.	A mixed-methods design has been adopted across 8 rehabilitation centres in São Paulo with 24 healthcare professionals and 17 MBRP intervention groups.

Source	Objectives	Findings	Significance	Methodology Used
[14]	The goal of the study has been to reduce cravings among people suffering from SUD with the help of MBI and transcranial direct current stimulation (tDCS).	The findings have shown that the combination of two treatment procedures can drastically reduce cravings and improve executive functions among patients, including their memory, risk-taking behaviour, inhibitory control and cognitive flexibility.	The study contributes by presenting the effectiveness of combining tDCS with MBI in improving cognitive and affective processes among patients.	80 young boys aged between 18 and 21 in the early abstinent from methamphetamine abuse have been selected for the research.
[15]	The focus of the research has been to test the effect of short-term Mindfulness-Based Stress Reduction (MBSR) on sleep quality in male patients suffering from alcohol abuse after withdrawal.	The 2-week MBSR has been found to increase the total sleep time and stable sleep among the participants, showing the potential of mindfulness techniques in improving sleep disturbances. These interventions can be provided to the patients over a short time, thus making them cost-effective. There is also less stigma attached to this method of treatment than to other mental health therapies.	The findings are significant as it shows short-term to improve sleep quality among patients with AUD.	A total of 91 male patients with AUD have been selected after 2 weeks of withdrawal treatment. Participants have been divided into two groups: participant group (n=50) and control group (=41).
[16]	The research aims to assess the impact of MBRP in reducing hypnotic use and chronic insomnia among women.	The findings show the efficiency of MBI in reducing the dependency on sleeping pills for women suffering from insomnia. The findings have shown that the dosage of sleep pills was reduced two months after MBI.	The findings of the research are beneficial as they show the impact which MBRP has in reducing insomnia among people suffering from SUD.	An RCT has been carried out with 34 participants in the intervention group and 36 in the control group.
[17]	The research has explored the potential of MBI in reducing substance use among medical students.	Substance abuse is generally linked to craving and withdrawal symptoms. The study shows that students who received MBI treatment had a slight decrease in their alcohol and tobacco usage decreased slightly. Simultaneously, they have also reported lower stress and anxiety.	The study is significant as the downward trend of alcohol and tobacco consumption that has been found can be further studied for better improvement.	A simple random sampling has been used for an experimental study of two groups comprising 320 students.
[18]	The research has aimed to evaluate the effect of MBI on sleep problems and emotional symptoms among university students in China.	Sleep problems in the research have been linked to behavioural problems such as substance abuse, and the results of the research have revealed significant intervention effects on sleep quality.	The significance of the research lies in expanding the understanding of MBIs' role in addressing sleep problems among university students.	For the research, 21 university students not on medication have been recruited who have been experiencing sleep problems and 24 others have been in a controlled group for the RCT.
[19]	The objective of the research has been to evaluate functional connectivity defects among Chinese patients suffering from substance abuse and the impact of the MBRP program.	The findings have shown that compared to normal people, people abusing ATS have lower functional connectivity. However, after MBRP treatment, higher levels of mindful awareness have been observed.	The study is significant because it shows that although functional connectivity is impaired in ATS disorder, MBRP can help treat the condition.	40 ATS patients were selected for the RCT research, 20 were placed in the experimental group and 20 in the control group.

Source	Objectives	Findings	Significance	Methodology Used
[20]	The goal of the study has been to assess the adoption of MBI among office-based patients with substance abuse.	The findings have shown the clinical benefits of MBI; health, well-being, sleep and other treatment outcomes have been found to have improved. Anxiety levels, depressive symptoms and substance consumption have all also been found to be reduced.	The study contributes by showing the high adoption rate of MBI among patients who have been prescribed buprenorphine in OBOT.	A 23-item, semi-structured cross-sectional survey has been carried out with 72 patients enrolled for the MBI treatment.
[21]	The study aims to use the MBI on patients suffering from SUD, particularly targeting individuals with frequent cannabis use.	The findings show that introducing MBI through mobiles reduces problematic cannabis consumption in adults, as consumers of cannabis are reluctant to seek help; this form of intervention is highly effective for them	The study has provided important insight into the effectiveness of mobile-based MBIs to reduce cannabis use.	The study has included a total of 630 participants divided into 3 groups for the research. An RCT has been used for the data analysis process.
[22]	The research has aimed to examine brain activity during cannabis use, and the reduction of it with MBI.	The findings of the research have shown that CUD has an overlapping neurobiology with other SUDs, and therefore interventions that help in reducing SUD are also applicable for reducing CUD.	The findings are significant as it shows how cannabis affects different brain activities and the reduction of its effects during brief engagement with reduced cannabis use.	The study has been carried out in two portions, the first section focusing on a systematic review while a second focusing on the brain activity of 49 adults.
[23]	The aim of the research has been to test the potential of MBI in improving the seven skills of living mindfully.	The findings have shown patients not only improving but also thriving with the integration of MBI in the treatment procedure.	The study is significant as it has shown a reduction in cravings among the participants and therefore the study establishes MBIs to be effective treatment for SUD.	The focus of the study has been MIR and 12-step facilitation therapy, a total of 29 participants were selected.
[24]	The goal of the study has been to use mindfulness interventions of young adolescent patients aged between 15-19 suffering from CUD in Germany to reduce the relapse rate.	The findings of the study show a significant reduction in cannabis consumption, while other benefits of the treatment were also observed among the patients, the reduction in CUD and cravings have been the most significant aspect of the research.	The study is significant as it shows both the potential of TAU and MBI in reducing CUD.	A total of 84 participants were selected for the study, 42 were provided with TAU and the other 42 received mindfulness-based interventions.
[25]	The study has been set out to explore the effectiveness of MBIs in improving sleep quality among university students.	The findings show university students often suffer from sleep disorders and addictive behaviour due to the increased stress they experience. MBI introduction into their routine has shown better coping results and improved outcomes.	The findings of the study are significant as it has shown MBIs to enhance quality of sleep among the students and also reduce digital addiction.	The SPSS method has been used within the research and a total of 370 participants have been selected.

DISCUSSION

All the secondary studies selected for the systematic review have aimed at evaluating the effectiveness of MBIs in reducing cravings, improving sleep quality or both among individuals suffering from substance abuse. The 18 different studies that have been synthesised for the research have all

shown a consistent pattern of showcasing the effectiveness of MBI on SUD patients. A key finding across all of the literature has been the significant reduction of cravings following MBIs. Studies consistently show that participants who have received MBIs experience lower overall craving levels [8] [9] [11]. Research has shown that patients who have received MBIs experience higher bilateral striatal and

prefrontal network strength [8]. The research shows that when patients are provided with MBI during their recovery stage, it causes brain changes, making them better at decision-making and other salience attributes. Similarly, it is argued that combining MBI with transcranial direct current stimulation (tDCS) also improves the cognitive functions of a person; they are less prone to experience cravings, improved memory, higher risk-taking ability, better inhibitory controls and cognitive flexibility compared to other patients from the control groups that have not received the same treatment [14]. These findings show that MBIs not only change the subjective experience of a person but also cause neurological changes.

Mindfulness is therefore seen as a comprehensive recovery program that supports the recovery process of the patients and prevent relapse to SUDs. Research findings have revealed that introducing MBIs in the treatment procedure reduces the overall cravings, among those that received treatment, reports of cravings were reduced drastically [23]. Along with craving reduction, the patients have also reported increased attention span, wisdom and compassion. Thus, integration of MBI in the drug abuse treatment of rehabilitation centres have more potential in treating patients compared to the traditional methods. Past studies also establish that the role of mindfulness-based treatments is essentially to strengthen the awareness and attention among patients, but this also reduces craving, distress and drug seeking behaviour [26] [19]. The result of intervention generally shows a reduction on impulse substance abuse and negative emotions. As MBI improves the self-efficiency and impulse control of the patients, they are able to better resist cravings. The study has found MBIs to be particularly effective on children and the adolescents, as they have better chances of improving their cognition and mental health through these interventions. Another study argued that compared to the 12-step program, MBIs are much more effective in reducing craving levels [24]. MBIs teaches patients to meditate and use different form of exercise to become more mindful and this helps in improving their interpersonal relationships and other problems they face in life.

Another important theme emerging from the review is the role of MBIs in relapse prevention and behavioural regulation. Certain studies applied MBI-based treatment on different demographics of people and have found people to be more accepting of MBI and other MBI-based treatments, such as mindfulness-based relapse prevention (MBRP) and reporting higher success [10] [12]. The ability of participants to actively apply mindfulness skills in real-life situations is symbolic of MBIs having long-term behavioural change. In addition to craving reduction, a significant amount of literature has also focused on the role of MBIs in reducing sleep disturbances experienced by patients with SUDs. Research findings have also reported that even the use of short-term mindfulness-based stress reduction (MBSR) can significantly help among patients with a drug use history

[15]. Patients in the study have reported improved sleep after only two weeks of treatment, as their quality of sleep has improved drastically with MBIs. Similarly, studies found MBI-based treatment leading to less use of sleeping pills or hypnotics among patients [16]. Other research studies in the area have also reported MBIs to have caused enhanced sleep outcomes and reduction of anxiety and depressive symptoms [18] [20]. The results of the review are consistent with other researchers, as it shows students with substance abuse experience increased mindfulness and experience less daytime dysfunction.

MBI is often related to better sleep quality, research by finds that MBI reduces post-traumatic stress among patients, the treatment of MBI recognizes and reduces the urge of substance abuse and increase their awareness [27]. The use of the randomized controlled trials in the research has been significant in showing the reduced alcohol consumption and decreased cravings. However, the study mentions that although interventions are not aimed at improving sleep quality directly, the support recovery process helps in improving sleep. This is also supported past studies [25], as it shows that MBIs usefulness in reducing arousal during the pre-sleep period, higher self-control, relaxation and compulsive behaviour. MBI teaches better coping mechanisms in the educational settings, leading to improved outcomes. Researchers have also argued better sleep quality to be associated with effective MBI as patients that received MBI tend to show better physical functions [28]. Other research studies also agree with these findings as patients report improved quality, psychological parameters, and work performance after MBI based treatments [29]. MBI also helps in strategizing and reducing other internet based additive behaviour.

The articles reviewed have also shown the high flexibility and adaptability of MBIs; findings have shown the potential of combining internet- and mobile-based interventions (IMIs) with MBIs [21]. The study notes that treatment for substance abuse is met with prejudice and resistance, but providing patients with IMIs can lead to client satisfaction, increased mindfulness and lesser consumption of cannabis. Past findings have also highlighted the effective role which MBI plays in helping patients developing skills that helps them in managing their discomforts, sleep problems, negative emotions and cravings [30]. In doing so, they learn adaptive responses for self-regulating these situations. Researchers have also emphasised the applicability of MBIs in community and public health settings, particularly for people belonging to vulnerable sections of society [13]. While other research studies expand the findings by including university students who are more prone to substance abuse [17] [18]. MBIs have been found to improve stress and anxiety issues, high intentions to continue and satisfaction. However, while some of the studies report positive outcomes, the degree of improvement varies across the board, as researchers only observed a slight reduction in substance use [17], while the another study focuses more on the neurobiological

mechanism instead of behavioural outcomes, which can limit clinical practice [22]. Overall, the findings of this systematic review indicate MBIs to have promising effect on the treatment of disorders. The studies have found MBIs and meditation to help reduce cravings, improve sleep, and prevent relapse.

CONCLUSION

As concluding remarks for the research, the systematic review has critically evaluated the effectiveness of MBIs and meditation as part of treatment procedures to treat patients suffering from SUDs. Based on the 18 articles that have been synthesised within the research, the findings show MBIs to be valuable in treating addiction. The studies have been carried out across diverse populations and settings; however, there remains consistency in the results and the potential of MBIs in reducing craving intensity, enhancing emotional regulation, and improving sleep-related outcomes. These findings are particularly significant due to the strong interrelationship which exists between cravings, sleep disturbances and risk of relapse during recovery. However, despite the potential, there are significant limitations to the research. There is heterogeneity across the included studies in the sample size and participant characteristics that have been selected for the study. While some of the studies have introduced randomised controlled trial designs, others have used small and mixed methods. The MBI methods used in the research are also very diverse, as researchers have used MBSR, MBRP, and IMIs, which makes it difficult to determine standardised approaches. Simultaneously, while RCTs have been used as the standard form of testing across the studies, a number of studies reported short-term outcomes, which makes it harder to evaluate the long-term effects and potential for relapse.

Future research carried out on the subject would first need to address these gaps in the study by conducting a large-scale longitudinal study with intervention protocols that are standardised for achieving results that are consistent. There is also a need for carrying out primary research using RCT and interviewing patients suffering from SUD directly to understand the exact problems they face and how substance abuse negatively affects their lives. The integration of MBI with other treatment methods, such as medicinal or digital health problems, can further enhance both the accessibility and effectiveness of the treatment. Expanding the research across demographics in future research can further strengthen the applicability of the findings and observations.

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