

Effect Of Mindfulness Based Relapse Prevention Therapy on Uncontrolled Aggression Among Individual with Amphetamine use Disorder: a Systematic Review

Aftab Hussain¹, Prof. Dr. Muhammad Saleem²

¹PhD Scholar at Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan

²Professor/Chairman of Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan

Email: ¹aftab_hussain12@yahoo.com, ²muhammad.saleem@iub.edu.pk

ABSTRACT

Mindfulness-based relapse prevention (MBRP) is an approach that incorporates cognitive behavioral relapse prevention with mindfulness practice. The present research indicates that MBRP can effectively minimize craving in people with substance use disorder (SUD). The purpose of this review was to examine the efficacy Mindfulness-Based Relapse Prevention (MBRP) strategies to mitigate uncontrolled aggression in individuals with amphetamine use disorder. In the context of a systematic review, this paper proposes a research project to investigate the effect of mindfulness based relapse prevention therapy on uncontrolled aggression among individual with amphetamine use disorder. Selection of studies, data extraction, and risk of bias assessment were carried out. PRISMA protocol was applied to ensure a standardized review strategy. No ethical approval was required. Review indicated that mindfulness training intervention as MBRP was successful for individuals with amphetamine use disorder. This preventive strategy has helped them improve their ability to deal with temptation and high-risk behaviors, such as uncontrolled aggression

Keywords

Amphetamine use disorder, Mindfulness, Prevention, Aggression, MBRP

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

Amphetamine is a psycho-stimulant drug and it is present in crystal, powder, and pill form, but the most common route of administration is intranasal, which has a longer duration of action (McKetin et al. 2006). Methamphetamine hydrochloride is a medically available drug for attention deficit hyperactivity disorder treatment (Pates, 2019). These drugs have marked central and peripheral stimulating effects on people, and prolonged use results in a series of mental and physical symptoms, including anxiety, confusion, insomnia, mood disorders, cognitive decline, paranoid delusions and hallucinations (Brewer, 2019). Further, amphetamine use disorder is described as the illicit use of amphetamine as a drug of abuse. Amphetamine is an inhibitor of the dopamine, norepinephrine, and serotonin re-uptake. Intoxication results in hyper-alert, excited condition characterized by feelings of euphoria and enhanced libido (Rhemtulla et al. 2016). Amphetamine use is often correlated with insomnia, anxiety with hysteria, dry mouth with tooth loss, and memory deficits (Rhemtulla et al. 2016).

The use of amphetamine as an illicit drug of abuse is becoming increasingly prevalent in both the United States and the world. An estimated 2 percent of the US population has used amphetamine drugs. There are especially high abuse rates in the Midwestern and Western regions (Parnian et al. 2016). There is an increased risk of developing amphetamine use disorder in people with underlying psychological problems, mood disorders, and ADHD. Low education, early age of substance use, and underlying disability are linked to abuse disorder (Kirisci et al. 2015). Therefore, training strategies of treatment that

teach people the ability to control emotions tend to be successful in avoiding the risk of addiction and decreasing dependency, relapse and related emotional problems such as aggression (Brewer, 2019).

Mindfulness-based prevention of relapse is a modern cognitive-behavioral method based on relapse prevention studies and mindfulness-based interventions that were proposed for the treatment of use disorders by Witkiewitz, Marlatt and Walker (2005). The aim of this therapy is to provide awareness and encourage individuals to acknowledge thoughts, feelings and emotions through practice of mindfulness and use it in the face of high-risk situations as a coping strategy. Mindfulness is a state of motivated attention and knowledge of what is going on at the moment that enables the person to control his emotions (Brewer, 2019).

Stimulants of the amphetamine type, including methamphetamine, amphetamine and dextro-amphetamine, are highly addictive synthetic drugs showing increasing abuse rates among people with large socio-demographic profiles (Pates, 2019). The use, production and distribution of amphetamine is a major problem in globally and now it's the second most common illicit drug globally after cannabis. Statistical data from the United Nations Office on Drugs and Crime (UNODC) show that between 25 million and eighty million people use amphetamine drugs worldwide (UNODC, 2012). The prevalence of drug addiction is growing at an alarming rate in Pakistan. Pakistan has 6 million drug users, according to the United Nations Office on Drugs and Crime (UNODC, 2014). UNODC (2014) estimates that more than 1 million Pakistanis aged 15 to 64 years use amphetamine on a regular basis. The abuse of amphetamine is a major public health

concern given that initial exposure can progress to dependency as quickly as in a single week (Clark et al. 2016).

The problematic patterns of the usage of amphetamine-type stimulants are characterized by amphetamine use disorders, which involve both abuse and dependency, contributing to the development of addiction and withdrawal symptoms (McKetin et al. 2016). Further, the routine use of amphetamine drugs may result in adverse physical, psychological, and social consequences. The use of amphetamine is often related to social impacts, such as abuse, aggression and illegal activity (Semple et al. 2005). There are currently no approved drugs for the treatment of use disorder. Psychosocial therapies have seen promising outcomes, however results are inconsistent with the continuation of treatment and several reports indicate significant reduction in drug use at the follow up (Kirisci et al. 2015).

Mindfulness-Based Relapse Prevention (MBRP)

Mindfulness-based prevention of relapse is a modern cognitive-behavioral intervention based on dependency relapse prevention studies and mindfulness-based interventions (Witkiewitz et al. 2005). The aim of this therapy is to lead people to accept thoughts, feelings and emotions through practice of mindfulness and use it in the face of high-risk situations as a coping strategy. The program lasts for eight weeks and may have a maximum of six to 12 participants in group size (Enkema, 2016). Each session consists of a maximum of two hours. Several clinical findings in diverse populations indicate that the eight-week MBRP program is useful for the reduction of relapses in addictive behavior. Each MBRP session is progressively established and has a particular objective and consequence (Priddy et al. 2018). Recovery is a lifelong process and participants are made to realize the significance of determination and diligence. Having a system of help will assist the participant to continue such practice (Groves, 2014).

Mindfulness and Aggression

Although the current research literature on aggression and mindfulness is sparse, researchers have hypothesized that approaches focused on mindfulness could be an effective alternative or complementary intervention for aggressive behavior (Fix & Fix, 2013). In particular, it is assumed that mindfulness-based strategies minimize impulsive behavior, increase the control of adaptive emotions, and thus reduce the negative influence of all identified triggers of aggression. Additionally, there is an ongoing need for substantive research into the relationship between mindfulness and aggression, particularly among clinical populations, to determine whether there is a sufficient correlation between trait mindfulness and aggression to justify evaluating mindfulness-based interventions as an intervention for aggressive behavior. Because aggression among drug abuse treatment seekers is highly prevalent (Stuart et al. 2009), trait awareness among drug abuse treatment seekers is lower compared to other populations (Priddy et al. 2018), and mindfulness-based interventions

have proven effective in reducing relapse to substance use among people seeking drug abuse therapy (Bowen et al. 2017), individuals receiving services for substance use constitute a large group in which the association between mindfulness and aggression can be studied.

Mindfulness-Based Relapse Prevention (MBRP) Steps

- The first session examines the concept of the automatic pilot in which participants are given an idea of how without thinking one behaves and its link to relapse. To bring this perception where the person is made to know what is taking place in his/her mind and body, Mindfulness is introduced. The raisin exercise allows participants to grasp the notion of mindfulness during which the participants are exposed to the body scan meditation. The first session involves thorough discussions about any sort of reservations about the method. Participants are then asked to choose and carefully perform one everyday activity and report their experiences.
- The second session introduces the individual to the stimuli. Triggers are those experiences in the participants that trigger cravings. Participants are instructed on how not to respond to these stimuli. As a sequence of stimuli, the feelings, emotions and actions of causes are added and reactive behavior is given light to. Using urge surfing, stimuli are dealt with where participants are thought to remain with the craving and not react to it. In order to add uncertainty to any distress caused by urgent surfing, mountain meditation is implemented.
- The participants are encouraged to practice mindfulness during the day throughout the third session by paying attention to their breath, which allows them to concentrate on the here and now. This causes lower levels of reactivity and higher levels of comprehension of perceptions, feelings and thoughts, resulting in reactive actions being decreased. The participants are introduced to SOBER (Stop, Observe, Breath, Expand, Respond) breathing space.
- The fourth session discusses circumstances in which the individual has in the past resorted to drug use. Participants are taught how to look differently at conditions that trigger such urges and learn how not to respond to such challenging circumstances.
- The fifth session is called acceptance and skillful intervention, where one explores how a person can consider conditions that may be stressful or frustrating, which may have triggered the drug use in the past.
- Participants are made to realize in the sixth session that thoughts are ideas and that one does not become their thoughts and thus does not have to behave or act on them. As a part of the relapse period, participants are often made to look at thoughts and values.
- In the seventh session, participants are made to look at their lives from a wider perspective, looking at a healthy lifestyle. The participants can be encouraged to heal by looking at a lifestyle that engages in nourishing activities. Participants are prepared for the conclusion of therapy and become more comfortable with mindfulness practice on their own.

- The final session is entitled Social Support and Continuing Practice. Participants are made to realize the value of a support group and how it is important to continue practice to prevent relapse.

Significance of MBRP in Amphetamine use Disorder

It is evident from literature that in amphetamine-dependent individuals, MBRP interventions have a positive effect on craving reduction. Mindfulness-based intervention may increase the ability of the patient to cope with the cravings and symptoms of withdrawal (Hicks, 2016). Moreover, this therapy, instead of challenging and avoiding unpleasant thoughts and emotions caused by the cessation or use of substances to relieve them, establish a different style of communication without reactions and a new method of treatment that admits information, thoughts and feelings of distress without judgment and evaluation (Hussain, 2015).

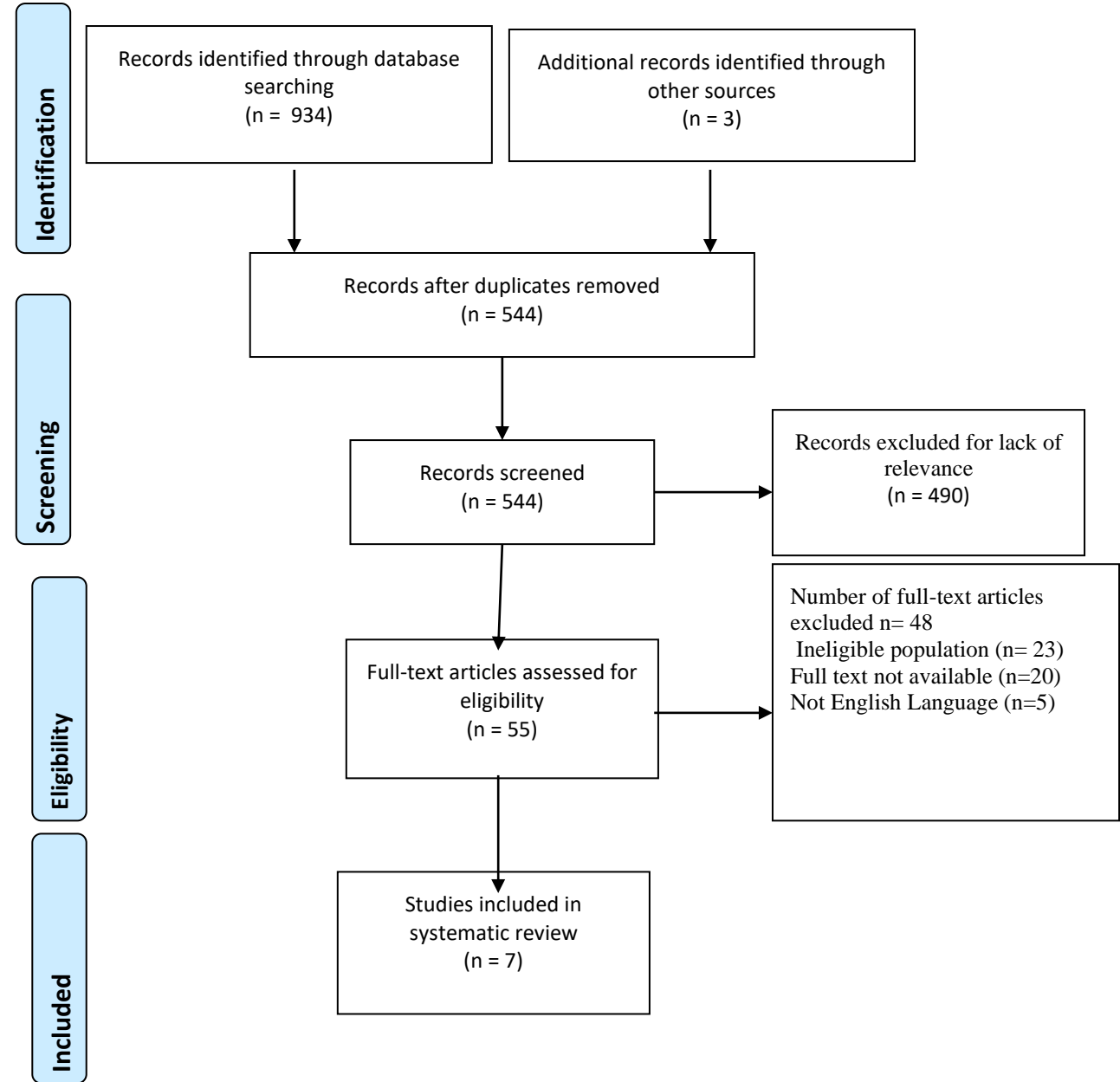
Objective Of The Study

The goal of this study was to evaluate the effectiveness of MBRP therapy to reduce aggression among individuals with amphetamine use disorder.

Research Methodology

Review Construction

A PRISMA protocol was utilized to ensure a standardized approach to the development of this systematic review (Liberati et al. 2009). The PRISMA protocol is an evidence-based minimum set of entities for reporting in systematic reviews and meta-analyses. This review takes the form of a descriptive analysis as the studies present epidemiological data of a cross-sectional design.



Search Strategy

Electronic databases NCBI, PubMed, UpToDate, ResearchGate, Medline, Embase, CINAHL, Cochrane and Web of Science were evaluated to identify relevant studies that were published during January 2016 to January 2021. The search strategy involved the key terms pertaining to the concepts; to reach maximum sensitivity, a combination of the terms “Amphetamine use disorder”, “Mindfulness, Prevention”, “Aggression”, “MBRP”, “Uncontrolled aggression”, and “Amphetamine” were considered. Studies were retrieved and were involved after reading the title and abstract of the study. Author further evaluated the reference lists of chosen studies to assess any additional studies.

Selection Criteria

This study has used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to make the basis of selection criteria using the PICO (P - Populations/People/Patient/Problem, I - Intervention(s), C - Comparison, O - Outcome) worksheet and search strategy as shown in table 1. Further, randomized controlled trials, case-control studies, and cohort studies fulfilling the following criteria were included: (1) English language, (2) studies from the last 5 years (3) studies conducted on Humans only, and (4) report of any considered outcomes (5) studies in inclusion of amphetamine type stimulant users. If multiple trials or studies were published by the same center, only the most complete and recent one was included. Studies that were excluded include: (1) studies with more than 5 years of publication (unless publication has extreme relevance up to this day) (2) non-relevant articles by abstract and content and (3) case reports, editorials, letters, and studies having duplicate data or already published data.

Assessment of Quality and Risk of Bias

The author himself chose the studies. There was no inclusion of studies which were not in the public domain. Studies generated by the search have been evaluated for relevance. In order to reduce the risk of developing bias in the results examined, potentially relevant papers were retrieved in full and assessed by the reviewer. In order to determine the validity and the consistency of the article, the full text of the included studies was extensively reviewed. The probability of bias assessment was considered in accordance with the parameters of the Newcastle-Ottawa Quality Assessment Scale.

Table 1: PICO (Patients, Intervention, Comparison, Outcome) Worksheet

1.	Population	Individuals with substance use disorder.
2.	Intervention	Mindfulness based relapse prevention therapy.
3.	Comparison	Direct comparison with other management methods.
4.	Outcome	Reduction of uncontrolled aggression.

Findings & Discussion

The literature search as detailed above was limited in its success in terms of finding peer-reviewed literature that dealt with the specific PICO statements identified during the problem formulation stage. As previously mentioned, this required the researcher to utilize other publications in determining responses to the research objectives. Inference from studies conducted with similar populations along with examination of grey literature were conducted to help with developing a greater understanding. The results of the review are divided across several themes that integrate the different types of evidence and literature included to help address the study objectives. First, included in the table 2 below are studies that best fit the PICO framework defined in the study methodology. This evidence is sadly scant, yet was able to help develop several key themes that relate to the objectives of the research report. Finally, inference from evidence published internationally was conducted, in order to try and lend more credence to identify the factors leading to compassion fatigue and burn out. These are combined where applicable below and related to study objectives as appropriate.

The search strategy for this integrative review resulted in the inclusion of seven scholarly journal articles reporting primary research. Fifty five studies were retrieved that provided answers to the target questions. Abstracts were re-evaluated and excluded forty four of them either due to irrelevance to the study topic or absence of clear data required in our inclusion criteria. Thus, seven studies were included in the final review (Table 2). These seven studies were arranged in table constructed to aid data review and analysis. Data analysis was performed, and then the conclusion and implications for future research were generated based on the review.

Seven cross sectional studies were selected for inclusion. The small number of studies selected for inclusion represents yet again the limited volume of peer-reviewed evidence addressing this topic. However, in spite of the limited number of such, several key themes emerged with regards to the factors affecting aggression in amphetamine use disorder. As revealed in the evaluation of these studies, overlaps occurred in the key areas of focus of certain studies. Table 2 below summarizes the results of the integrative review by concentrating on the points of convergence and divergence in the findings of the study.

Table 2: Characteristics of Included Studies

Authors	Place of Study	Primary and Secondary Outcomes	Study Population (n)	Study Design	Acceptability Measured
Davis et al. 2018	USA	MBRP individuals abstained from substance use immediately after intervention and maintained a flat trajectory through the study. Only MBRP demonstrated significant improvements in stress levels and aggression.	n=79 Male=65% Female=35%	Prospective, randomized comparative trial	Yes
Glasner et al. 2017	USA	Aggression severity decreased during/after treatment with MBRP.	n=63 Age: 22-67 Male=45.3 Female=54.7	A pilot RCT Length: 2 years	Yes
Gryczynski et al. 2018	USA	Reductions in Craving and Craving related adverse behaviours.	n=66 Age: 43 (M) Gender: Male=65% Female=35%	Non-randomized pilot study. Length: 2 years	Yes
Abed et al. 2019	Iran	Differences among the scores of craving, desire, aggression and lapse occurrence.	60 adult Iranian males Age: between 27 and 50	Randomised Controlled Trial Length: 2 years	Yes
Witkiewitz et al. 2017	USA	Consequences lower in the MBRP group.	n=105 Age:35.8 (M) Gender: Female	A pilot RCT. Length: 2 years plus 15-week follow up period.	Yes
Bowen et al. 2019	USA	Acceptance & acting with awareness increased in MBRP and aggression decreased to greater extent.	n=286 Age: 18-70 Gender: Male (71.5%) Female (28.5%)	Randomized controlled trial Length: 4 years	Yes
Amaro et al. 2017	Australia	The feasibility and acceptability for integrating an MBRP intervention into SUD management.	n=318 Age: 18-58 (34 M)	Single group repeated measures design Length: 3 years	Yes

Bowen et al. (2014) conducted the randomized controlled trial (RCT) to evaluate MBRP intervention with the aim of discovering the feasibility and initial efficacy of MBRP intervention by assessing substance use outcomes, cravings, aggression and acceptance. The 12-month follow-up found that participants in MBRP reported 31 per cent fewer days

of drug abuse and a significantly higher likelihood of not having uncontrolled aggression and cravings (Bowen et al. 2019). Further, in a study by Davis et al. (2018) the effects MBRP were evaluated plus additional 12-step meetings to assess perceived stress, emotional behavior, craving and substance use. Davis et al. (2018) reported that, at the end of therapy, individuals in MBRP refrained from substance use following treatment and maintained a flat trajectory throughout the rest of the study. During the treatment phase, MBRP individuals showed statistically significant progress in their stress levels (Davis et al. 2018).

Amaro et al. (2017) assessed the feasibility, acceptability and potential benefits of integrating the MBRP-W program into amphetamine use disorder for a culturally diverse, low-income group of women. Changes in psychological distress over time varied significantly by exposure to MBRP therapy, with scores declining by an average of 1.7 points per 6-month survey among people involved. However, Witkiewitz, et al. (2017) examined the relative efficacy of MBRP and RP in preventing relapse of substance use during intensive treatment of residential substance abuse for women referred by the criminal justice system. MBRP participants had 96 percent fewer days of drug use and aggression. The effects of drug use were found to be lower in the MBRP group (39 per cent) although this was not statistically significant.

The incremental effectiveness and results of MBRP for stimulant-dependent adults showing uncontrolled cravings and irritability were shown in a two-year study by Glasner et al. (2017). Pairwise contrasts revealed an advantage for MBRP over anxiety severity at 1-month follow-up. Psychiatric severity improved significantly with MBRP therapy over time. Additionally, Abed & Shahidi (2019) performed an eight-week experiment compared MBRP to usual treatment strategies for Iranian males. Major reductions in craving, aggression and urge to use were recorded by participants in the MBRP therapy. During the three-month follow-up, lower levels of positive urinalysis tests were recorded among MBRP participants; however, no significance testing was performed.

Research analysis supports a wide variety of developments related to meditation-based therapies. Major improvements were seen in cravings and aggression among individuals with amphetamine use disorder (Amaro et al. 2017; Bowen et al. 2019; Davis et al. 2018; Witkiewitz et al. 2014). Improvements in major negative impact and stress have also been reported (Amaro et al. 2017; Glasner et al. 2017). MBRP steps have a beneficial effect on the reduction of cravings in individuals dependent on amphetamine. As shown by the results of the tables, MBRP therapy had a major impact on reducing aggressive behavior. Such reports are consistent with previous studies. MBRP has significantly enhanced the efficacy of treatment for drug dependence to improve patients' psychological health. Mindfulness-based intervention may significantly raise the ability of the patient to cope with the cravings and symptoms of withdrawal. MBRP intervention can increase craving control and decrease the stress and aggression associated with amphetamine use disorder (Van Dijke et al. 2018).

MBRP makes addicts conscious of their emotions and directs the thoughts of addicted individuals to other aspects, such as breathing, walking with the presence of the mind

and the sounds of the environment, and thereby minimizing urge (Verdejo-Garcia et al. 2008). MBRP strategies have a beneficial effect on reducing amphetamine-dependent individuals' aggression. As the results shown in the table show, MBRP had a significant effect on the reduction of aggression. Increasing studies indicate its usefulness and acknowledge the effectiveness of mindfulness and its beneficial effect on behavioral abnormalities such as aggression. Consistency of meditative practice and continued support have been identified as a key factor in long-term success (Gryczynski et al. 2018). The decreased severity of the aggression may be explained by increased awareness of the thoughts, sensations, and emotions that accompany the aggression, and acceptance of non-reactivity to the aggressive response (Bowen et al. 2019; Davis et al. 2018).

Glasner et al. (2017) evaluated the usefulness of mindfulness in the improvement of symptoms of depression in MBRP participants. This suggests that the use of mindfulness-based interventions for people with addictions may be greatest for those with clinically significant negative effects. Acquiring coping skills that emphasize the acceptance of negative effects and discomfort in MBRP may replace maladaptive behavior patterns (Glasner et al. 2017). Reductions in stress mediating the correlation between MBRP treatment assignment and reduced substance use suggest that reducing stress can act as an effective element in the recovery (Amaro et al. 2014; Davis et al. 2018). The findings indicate that continued practice of mindfulness over time may enhance the ability to monitor and address factors that contribute to well-being, thereby encouraging long-term outcomes. Continued support following treatment with MBRP may be necessary to ensure long-term success (Bowen et al. 2009; Bowen et al. 2014; Davis et al. 2018). Mindfulness practices adapted to relapse prevention programs have shown to be most effective in reducing cravings and stress and promoting longevity of substance use disorder (Price et al. 2018). To determine precision in the longevity of outcomes and to further refine program designs as needed, detailed studies with longer follow-up periods are required. With the widespread occurrence of amphetamine use disorders and related health problems, it is imperative that nurses play an active role in understanding successful management strategies.

Conclusion

Results of the present study reveal that mindfulness-based prevention therapy has a significant effect on the reduction of aggression in the individuals with amphetamine use disorder. Individuals learn to avoid high-risk situations and behaviors by developing new skills such as denial of admission, aggression and control of temptations, effective communication and decisive behavior. Learning cognitive strategies also helps patients shift their focus away from stimulating thoughts to drugs in the short term and, in the long run, they are encouraged to avoid recurrence. Future research should support the full implementation of this program over an extended period of time with a number of populations to determine the effectiveness of the program. It is suggested that the efficacy of this treatment in substance users should be addressed in future research and

compared with other group therapies, such as dependency management and matrix treatment.

Limitations of the Study

The study has a few limitations. First of all, the retrospective nature of the most of included studies leads to an inevitable selection bias. Secondly, the data retrieved were based on searching all available clinical databases and electronic records, but there remains the potential for operations that were falsely coded and therefore may have been missed from the analysis. Thirdly, regarding adverse effects, only a few studies showed a complication rate for the analyzed procedures. Lastly, decision of choice of MBRP was made on an individual case-by-case basis by the attending healthcare professional, making group allocation and randomization difficult to achieve. It can cause reduced external validity.

References

- [1] Abed, M., & Ansari Shahidi, M. (2019). Mindfulness-based relapse prevention to reduce lapse and craving. *Journal of Substance Use*, 24(6), 638-642.
- [2] Amaro, H., Spear, S., Vallejo, Z., Conron, K., & Black, D. S. (2017). Feasibility, acceptability, and preliminary outcomes of a mindfulness-based relapse prevention intervention for culturally-diverse, low-income women in substance use disorder treatment. *Substance Use & Misuse*, 49(5), 547-559.
- [3] Bowen, S., Witkiewitz, K., Clifasefi, S. L., Grow, J., Chawla, N., Hsu, S. H., Larimer, M. E. (2014). Relative efficacy of mindfulness-based relapse prevention, standard relapse prevention, and treatment as usual for substance use disorders: A randomized clinical trial. *JAMA Psychiatry*, 71(5), 547-556.
- [4] Brewer, J. (2019). Mindfulness training for addictions: has neuroscience revealed a brain hack by which awareness subverts the addictive process?. *Current opinion in psychology*, 28, 198-203.
- [5] Clark, S. L., Gillespie, N. A., Adkins, D. E., Kendler, K. S., & Neale, M. C. (2016). Psychometric modeling of abuse and dependence symptoms across six illicit substances indicates novel dimensions of misuse. *Addictive Behaviors*, 53, 132-140.

- [6] Davis, J. P., Berry, D., Dumas, T. M., Ritter, E., Smith, D. C., Menard, C., & Roberts, B. W. (2018). Substance use outcomes for mindfulness based relapse prevention are partially mediated by reductions in stress: Results from a randomized trial. *Journal of Substance Abuse Treatment*, 91, 37–48.
- [7] Enkema, M. C. (2016). Mindfulness practice moderates the relationship between craving and substance use in a clinical sample (Order No. 10138425). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (1820916911).
- [8] Fix, R. L., Fix, S. T. (2013). The effects of mindfulness-based treatments for aggression: A critical review. *Aggression and Violent Behavior*, 18, 219–227.
- [9] Glasner, S., Mooney, L. J., Ang, A., Garneau, H. C., Hartwell, E., Brecht, M.-L., & Rawson, R. A. (2017). Mindfulness-based relapse prevention for stimulant dependent adults: A pilot randomized clinical trial. *Mindfulness*, 8(1), 126–135.
- [10] Groves, P. (2014). Buddhist approaches to addiction recovery. *Religions*, 5(4), 985–1000.
- [11] Gryczynski, J., Schwartz, R. P., Fishman, M. J., Nordeck, C. D., Grant, J., Nidich, S., ... O'Grady, K. E. (2018). Integration of Transcendental Meditation® (TM) into substance use disorder (SUD) treatment. *Journal of Substance Abuse Treatment*, 87, 23–30.
- [12] Hicks, S. (2016). Mindfulness-based relapse prevention for mothers recovering from substance use disorders: A grant proposal (Order No. 10007422). Available from ProQuest Central; ProQuest Dissertations & Theses Global. (1763003378).
- [13] Hussain, D. (2015). Meta-cognition in mindfulness: A conceptual analysis. *Psychological Thought*, 8(2), 132–141. doi:10.5964/psyct.v8i2.
- [14] Kirisci, L., Tarter, R., Ridenour, T., Reynolds, M., Horner, M., & Vanyukov, M. (2015). Externalizing behavior and emotion dysregulation are indicators of transmissible risk for substance use disorder. *Addictive Behaviors*, 42, 57–62.
- [15] Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gotzsche, P. C., Ioannidis, J. P., Clarke, M., Devereaux, P. J., Kleijnen, J., Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med*.
- [16] McKetin, R., Kelly, E., & McLaren, J. (2006). The relationship between crystalline methamphetamine use and methamphetamine dependence. *Drug and Alcohol Dependence*, 85(3), 198–204.
- [17] Parnian, K. M., Bafandeh, G. H., Shalchi, B. (2016). Comparison of sustained attention between methamphetamine addicts, heroin addicts, and normal people. *Journal of Research on Addiction*, 10(39), 147–62.
- [18] Pates, R., Riley, D. (2019). Interventions for amphetamine misuse. Oxford: Wiley-Blackwell.
- [19] Price, C. J., Crowell, S. E., Pike, K. C., Cheng, S. C., Puzia, M., & Thompson, E. A. (2019). Psychological and autonomic correlates of emotion dysregulation among women in substance use disorder treatment. *Substance use & misuse*, 54(1), 110–119.
- [20] Priddy, S. E., Howard, M. O., Hanley, A. W., Riquino, M. R., Friberg-Felsted, K., & Garland, E. L. (2018). Mindfulness meditation in the treatment of substance use disorders and preventing future relapse: neurocognitive mechanisms and clinical implications. *Substance Abuse and Rehabilitation*, 9, 103.
- [21] Rhemtulla, M., Fried, E. I., Aggen, S. H., Tuerlinckx, F., Kendler, K. S., & Borsboom, D. (2016). Network analysis of substance abuse and dependence symptoms. *Drug and Alcohol Dependence*, 161, 230–237.

- [22] Semple, S., Patterson, T., Grant, I. (2015). Methamphetamine use and depressive symptoms among heterosexual men and women. *J Use*, 10(1), 31-47.
- [23] Stuart, G. L., O'Farrell, T. J., & Temple, J. R. (2009). Review of the association between treatment for substance misuse and reductions in intimate partner violence. *Substance Use & Misuse*, 44(9-10), 1298-1317.
- [24] Van Dijke, A., Hopman, J. A. B., & Ford, J. D. (2018). Affect dysregulation, psychoform dissociation, and adult relational fears mediate the relationship between childhood trauma and complex posttraumatic stress disorder independent of the symptoms of borderline personality disorder. *European Journal of Psychotraumatology*, 9(1).
- [25] Verdejo-García, A., Lawrence, A. J., & Clark, L. (2008). Impulsivity as a vulnerability marker for substance-use disorders: review of findings from high-risk research, problem gamblers and genetic association studies. *Neuroscience & Biobehavioral Reviews*, 32(4), 777-810.
- [26] Witkiewitz, K., Marlatt, G. A., & Walker, D. (2005). Mindfulness-based relapse prevention for alcohol and substance use disorders. *Journal of Cognitive Psychotherapy*, 19(3), 211-228.
- [27] Witkiewitz, K., Warner, K., Sully, B., Barricks, A., Stauffer, C., Thompson, B. L., & Luoma, J. B. (2014). Randomized trial comparing mindfulness-based relapse prevention with relapse prevention for women offenders at a residential addiction treatment center. *Substance use & misuse*, 49(5), 536-546.