Mindfulness: can cannabis increase effectiveness?

Depression and anxiety are commonplace on college campuses across the world. Anxious and depressive symptoms among college students are even more widespread. With an environment that tends to foster higher amounts of reported stress, it is not surprising that this is true. However, the impacts of these symptoms on individuals can be severe and develop into more serious disorders if left untreated (Beiter et al., 2015). These symptoms take a toll on mental health, physical health and overall well-being. Addressing these symptoms and teaching people ways to deal with them is of the utmost importance.

Mindfulness based interventions have been proven to help decrease the amount of perceived stress, depression and anxiety (Carmody & Baer, 2008; Querstret, Cropley, & Fife-Schaw, 2018). Mindfulness can be defined as the acceptance and non-judgement awareness of the present moment (Greeson, 2009). Interventions with focus on these principles have proven to be influential in creating a more healthy and effective manner of dealing with anxiety provoking stimuli (Greeson, 2009). More recently, these studies have been tested through online delivery options. These results have shown promise with only one published article thus far that has been unable to find any significant results. However, the other studies that have been published have shown very promising results using this method of delivery.

The primary difference between face-to-face mindfulness interventions and the online mindfulness interventions tend to be the presence of a mindfulness instructor as well as the presence of other participants. Participants can frequently learn from one another and this can influence the positive reaction to mindfulness interventions. A few studies have found that

online participants in mindfulness interventions report similar decreases in perceived stress, anxiety and depression as those in face-to-face interventions. This method of delivery could help increase availability of mindfulness-based interventions to people that otherwise are unable to access them because of cost, time or transportation factors.

One of the primary issues that many people face when it comes to meditation is that it can be hard to get one's brain to calm down long enough to focus or fully concentrate. One of the principle traits of mindfulness is non-judging. Mindfulness incorporates this principle by teaching participants to simply note their thoughts without judgement. To notice the thought and then come back to the meditation and to do this as many times as necessary throughout the process. Taking this stance of non-judgement helps alleviate some of the shame or aggravation that can present itself otherwise in meditation practices. Perhaps, if people felt more relaxed from the start, it may help them be better able to focus on meditation.

Cannabis is known to have a calming or relaxing effect. It is thought that this effect is potentially produced because there are cannabinoid receptors in the brain within the hippocampus, cerebellum and the basal ganglia (Kuhn, Swartzwelder, & Wilson, 2014). Most people report a sense of euphoria or mental stimulation. One of the possible side effects that has been reported from therapeutic users of cannabis is an anxiolytic effect to decrease anxiety and depressive symptoms (Walsh et al., 2013).

The introduction of cannabis in combination with mindfulness may have an even greater effect on the reduction of anxious or depressive symptoms. The relaxing effect caused by cannabis may prove to promote the same non-judgement that mindfulness teaches. The aim of this study is to first study the effect that mindfulness alone has on decreasing anxious and depressive symptoms in adult (21+) college students. Secondly, this study aims to determine if self-reported cannabis use appears to increase the effectiveness of mindfulness on these same traits. It is hypothesized that mindfulness itself will produce a statistically significant effect on decreasing anxious or depressive symptoms. It is also hypothesized that participants that self-report as cannabis users will either report a lower level of initial anxious or depressive symptoms or show an even larger decrease in anxious and depressive symptoms than non-cannabis users when exposed to mindfulness meditation.

Literature Review

Mindfulness has been a popular form of meditation for many years. It was first introduced through Buddhism. However, it began to gain secular popularity about 40 years ago. Within the psychological community, mindfulness has proven to reduce stress, anxiety and depression. Programs have been developed using mindfulness principles that are starting to become more and more popular such as Mindfulness-Based Cognitive Therapy (MBCT), Mindfulness-Based Stress Reduction (MBSR) techniques, and various other mindfulness interventions that practitioners have begun to employ. Most of the methods of mindfulness that are currently used involve face-to-face sessions with a mindfulness guide.

Multiple studies have been conducted on the effectiveness of MBSR. Carmody and Baer (2007) investigated the effect that learning mindfulness had on both medical and psychological symptoms. The study consisted of 174 participants in nine different MSBR groups. The Mindfulness Based Stress Reduction programs consisted of an eight-week program that met once a week. Participants were given a pre-test and post-test that included demographic questions as well as; the Five Facet Mindfulness Questionnaire, the Brief Symptom Inventory, the Medical Symptom Checklist, the Perceived Stress Scale and the Scales of Psychological Well-Being. Participants were also asked to fill out weekly logs between sessions to determine how much time participants spent doing formal and informal mindfulness exercises between meetings. It was found that the mindfulness interventions had no effect on medical symptoms. However, mindfulness was determined to increase well-being, decrease perceived stress and psychological symptoms (Carmody & Baer, 2007). This is just one of many of the existing body of literature that supports the use of MSBR to reduce perceived stress, anxiety, depression and other psychological symptoms.

To determine the impact of Mindfulness-Based Stress Reduction on overall psychological health, Bergen-Cico, Possemato, and Cheon (2013) conducted a study. A total of 119 undergraduate students from two classes taught by the same professor were placed into either the treatment group (72 participants) or a comparison group (47 participants). The treatment group utilized MSBR (five weeks) structured into the class itself, whereas the comparison group was given weekly didactic lectures. The researchers measured mindfulness, anxiety and self-compassion. Both groups were given

pre-test and post-test questionnaires to fill out. Measures used included; the Kentucky Inventory of Mindfulness, the Philadelphia Mindfulness Scale, the Self-Compassion Scale and the Spielberger State-Trait Anxiety Inventory-Trait Form Y-2. The researchers found that there was a significant increase in mindfulness and self-compassion but not significant change in the amount of anxiety the treatment group experienced (Bergen-Cico, Possemato, & Cheon, 2013). These findings regarding anxiety are dissimilar to most other published studies.

As an example of the effect that mindfulness can have on anxiety, the MBSR was studied to explore the effect of stress reduction in patients with anxiety disorders (Vøllestad, Siversten, & Neilsen, 2011). The study included 106 participants and measures utilized included the Beck Anxiety Inventory, the PennState Worry Questionnaire, the Spielberger State-Trait Anxiety Inventory, Beck Depression Inventory, Symptom Checklist 90 (Revised Edition), Bergen Insomnia Scale and the Five-Factor Mindfulness Questionnaire. A randomized control trial was run and the researchers found that MBSR had an affect on all measures for anxiety and depression. However, there was no significant difference in sleep disturbance between the treatment and the control groups. The results of this study indicate that within a self-reported clinical population, Mindfulness Based Stress Reduction effectively seemed to decrease both anxious and depressive symptoms (Vøllestad, Siversten, & Neilsen, 2011).

The effect of Mindfulness Based Stress Reduction has also been researched regarding the change in trait anxiety and the role of self-compassion. Bergen-Cico and Kumar (2017) examined the causal relationship between

mindfulness, self-compassion and trait anxiety. There were 109 participants in the MBSR treatment group and 94 participants in the control group. The groups were determined via course selection. Students in two classes were given the option to participate, one of which became the control group and the other became the treatment group. Not only was a pre-test/post-test design employed but the researchers also utilized mid-test data collection to determine the causal links. It was found that MBSR effectively cultivated self-compassion and mindfulness while reducing trait anxiety. Changes in these variables at the mid-intervention collection point contributed to the changes post-intervention (Bergen-Cico & Kumar, 2017). However, more studies are now being conducted on the effectiveness of potential online delivery methods for mindfulness interventions.

The pilot study done on the effectiveness of an online delivery method of mindfulness was conducted by Glück and Maercker (2011). The aim of the study was to test the effectiveness of a brief version of mindfulness delivered online. The study examined the potential effects on distress, perceived stress, mood and emotional regulation. The participants study consisted of 49 participants, 28 in the treatment group and 21 in the waitlist control group. The measures used included the Global Score of the German Brief Symptom Inventory, the short version of the Symptom Checklist-90-R, the Perceived Stress Questionnaire, the Freiburg Mindfulness Inventory and the EMO-CHECK/SEK-27 (Glück & Maercker, 2011). The study found no significant results. It is important to note that to date, this is the only published article not stating significant results for online methods of mindfulness. However, the researchers did seem optimistic about future

research in this area, believing that it was possible for mindfulness delivered online to be effective despite the results of this initial study.

A study conducted in the following year by Krusche, Cyhlarova, King, and Williams (2012) was one of the first to study the effects of an online mindfulness course and the impact that it had on stress and find significant results. The researchers utilized a pre-test/post-test within group design to determine if the online intervention decreased the amount of perceived stress (using the Perceived Stress Scale) the participants experienced after the intervention was complete. In the sample of 100 participants, a statistically significant result was found for a reduction in reduced perceived stress after completing the program. These results were also found to be maintained a month after the intervention was over. However, the study had no control group which presented a major limitation (Krusche, Cyhlarova, King, & Williams, 2012).

This limitation was shared by a study conducted by Wahbeh and Oken (2016) to examine the effect of an online mindfulness intervention on the general public's quality of life, sleep disturbance, self-efficacy, perceived stress, mindfulness and depressive symptoms. Participants were sorted into two different treatment groups; 16 participants completed the Internet Mindfulness Meditation Intervention which included guided weekly sessions with a mindfulness practitioner as well as access to all the online resources and 15 participants completed the general mindfulness condition which included access to all the online materials for mindfulness but not the additional sessions. The measures used were; the Center for Epidemiologic Studies Depression Scale-5, the Five-Factor Mindfulness Questionnaire, the

Pittsburg Sleep Quality Index, the Perceived Stress Scale and the SF36v2. This study attempted to determine if an online mindfulness intervention would be feasible and acceptable. In this regard, the study found that it was. However, because the study was not designed to compare the groups to one another or to a comparison group there were no noted differences between the groups other than the amount of time spent meditating. It was found that the group with access to weekly sessions meditated more frequently than those participants in the other group. This tells us that for a general population, mindfulness online interventions are likely a good idea. However, without testing for the limitations that this study and the previous one had, it is hard making statements about generalization.

The most significant limitation presented by these studies left room for replication and extension. In a more recent study conducted by Querstret et al. (2018) similar results were found. However, the researchers utilized the same online mindfulness course conducted the experiment as a randomized waitlist control trial. The sample was comprised of 118 participants, 60 in the treatment group and 58 in the control group. Participants were given the Perceived Stress Scale, the Patient Health Questionnaire, the Generalized Anxiety Disorder 7-Item Scale and the Five Facet Mindfuless Questionnaire Short form as pre-test/post-test measures. These measures were also completed three-months and six-months after the intervention was completed. It was found that the online mindfulness course had a statistically significant effect on perceived stress, anxiety and depression. It was also found that the non-judging aspect of mindfulness had the biggest influence in producing those results (Querstret et al., 2018).

Similarly, Cavanagh et al. (2018) conducted a study to examine the effectiveness of a shorter version of an online mindfulness-based intervention on perceived stress, perseverative thinking and anxious and depressive symptoms in a non-clinical population. The study included 105 participants that were randomly assigned to either a treatment group or a control group. The treatment group was given access to a two-week online intervention of mindfulness. Pre-test and post-test data were collected using the Five-Facet Mindfulness Questionnaire, the Perceived Stress Scale, the Patient Health Questionnaire for Depression and Anxiety, the Perseverative Thinking Questionnaire and the Engagement and Experience Questionnaire. It was found that participation within the mindfulness-based intervention were correlated with significant changes on all the items measured and that no significant changes occurred within the control group (Cavanagh et al., 2018).

With the success that online intervention methods for mindfulness have displayed thus far, it is also important to note that a study was conducted to determine preferences for mindfulness delivery methods. Wahbeh, Svalina, and Oken (2014) ran a study to determine if participants would prefer group exercises, exercises one-on-one with a mindfulness practitioner or an internet method. The study utilized an online survey and was conducted on a primary clinical population. Based on screening questions, 71% of participants were identified as having PTSD, 76% were identified to have depression and 65% were found to have comorbid PTSD and depression. In total, there were 500 participants included. This study found that participants were more interested in internet or individual interventions than

group mindfulness interventions. Out of the three options, internet was rated as the first choice for most (43%) participants (Wahbeh et al., 2014). This indicates that that there is interest from individuals that would likely benefit from mindfulness interventions in internet delivery options.

Increasing the effectiveness of any mindfulness delivery option could be largely beneficial to large populations of people. Self-report studies have indicated that cannabis users perceive cannabis to have an anxiolytic effect, to increase their mood and even to reduce the symptoms associated with Post-Traumatic Stress Disorder (PTSD) (Walsh et al., 2013; Bitencourt & Takahashi, 2018). There are two primary active components of cannabis, Tetrahydrocannabinol (THC) and Cannabidiol (CBD). THC is the psychoactive ingredient in cannabis and CBD is the primary non-psychotomimetic ingredient. While Cannabidiol produces the effect of relaxation on the body, it does not produce a psychoactive high. Cannabidiol is not associated with the potential negative effects of THC like withdrawal symptoms or developing a tolerance (Bitencourt & Takahashi, 2018). There have been an increasing number of studies that support the potential use of Cannabidiol as a therapeutic intervention, particularly within PTSD research. However, more studies need to be conducted to determine what benefits cannabis could have both medically and therapeutically.

With medicinal and therapeutic cannabis use being legalized in more and more places, it is important for practitioners to know the potential effects of cannabis for therapeutic purposes. This prompted Walsh et al. (2013) to conduct a study to determine the potential reasons people were using cannabis products and what symptoms cannabis was effective at treating as

self-reported by the participants. The study included 628 participants; 87 recruited from a local medical dispensary and 541 online participants who all self-identified as current cannabis users for therapeutic purposes (CTP). The survey consisted of 414 questions without forced response and asked questions about access, patterns of use, perceived effectiveness, history of cannabis use, medical diagnoses, symptoms, mood and demographics. It was found that the most common symptoms participants used cannabis to treat were pain, anxiety and sleep disturbances/problems. Approximately 96% of participants reported that cannabis effectively treated the symptoms either always (72%) or often (24%) (Walsh et al., 2013). This provides evidence that cannabis use may be able to effectively help reduce the symptoms of anxiety and other psychiatric disorders but more research needs to be done examining this relationship.

References

- Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders, 173* , 90-96.
- Bergen-Cico, D., & Kumar, A. (2017). Examining the processes of change associated with mindfulness-based meditation and reductions in trait anxiety. *Journal of Depression and Anxiety Disorders* , *1* (1), 1-11.
- Bergen-Cico, D., Possemato, K., & Cheon, S. (2013). Examining the efficacy of a brief mindfulness-based stress reduction (brief mbsr)

program on psychological health. *Journal of American College Health, 61* (6), 348-360.

- Bitencourt, R., & Takahashi, R. (2018). Cannabidiol as a therapeutic alternative for post-traumatic stress disorder: From bench research to confirmation in human trials. *Frontiers in Neuroscience, 12* (502).

- Carmody, J., & Baer, R. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine* , *31* (1), 22-33.

- Cavanagh, K., Churchard, A., O'Hanlon, P., Mundy, T., Votolato, P., Jones, F., Gu, J., & Strauss, C. (2018). A randomised controlled trail of a brief online mindfulness-based intervention in a non-clinical population: Replication and extension. *Mindfulness, 9* (4), 1191–1205.

- Glück, T., & Maercker, A. (2011). A randomized controlled pilot study of a brief web-based mindfulness training. *BMC Psychiatry, 11* , 175.

- Greeson, J., & Brantley, J. (2009). Mindfulness and anxiety disorders: Developing a wise relationship with the inner experience of fear. In F. Didonna (Eds.), *Clinical handbook of mindfulness* , (pp. 171-188). New York, Springer-Verlag: New York.

- Krusche, A., Cyhlarova, E., King, S., & Williams, J. (2012). Mindfulness online: A preliminary evaluation of the feasibility of a web-based mindfulness course and the impact on stress. *BMJ Open 2012, 2* , e000803 doi: 10. 1136/bmjopen-2011-000803.

- Kuhn, C., Swartzwelder, S., & Wilson, W. (2014). *Buzzed: The straight up facts about the most used and abused drugs from alcohol to ecstasy.* New York: W. W. Norton.

- Querstret, D., Cropley, M., & Fife-Schaw, C. (2018). The effects of an online mindfulness intervention on perceived stress, depression and anxiety in a non-clinical sample: A randomised waitlist control trial. *Mindfulness* . doi: 10. 1007/s12671-018-0925-0

- Vøllestad, J., Siversten, B., & Nielsen, G. (2011). Mindfulness-based stress reduction for patients with anxiety disorders: Evaluation in a randomized controlled trial. *Behaviour Research and Therapy.* doi: 10. 1016/j. brat. 2011. 01. 007

- Wahbeh, H., & Oken, B. (2016). Internet mindfulness meditation intervention for the general public: Pilot randomized controlled trial. *JMIR Mental Health, 3* (3). doi: 10. 2196/mental. 5900

- Wahbeh, H., Svalina, M., & Oken, B. (2014). Group, one-on-one, or internet? Preferences for mindfulness meditation delivery format and their predictors. *Open Medicine Journal* , *1* (1), 66-74.

- Walsh, Z., Callaway, R., Belle-Isle, L., Capler, R., Kay, R., Lucas, P., & Holtzman, S. (2013). Cannabis for therapeutic purposes: Patient characteristics, access, and reasons for use. *International Journal of Drug Policy.* doi: 10. 1016/j. drugpo. 2013. 08. 010