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Mindfulness-based meditation and its effects on college students

Jordan Sieja

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Mindfulness-based meditation and its effects on college students

Abstract
Mindfulness-based meditation is a practice that has been proven to have many physiological and psychological health benefits such as positive lifestyle habits, increased mindfulness, decrease in substance use, decrease in stress, better mood states, and enhanced coping strategies. University students undergo many different types of stressors at one time such as financial instability, identity development, academic pressures, parental expectations, and racial/cultural differences (Kadison & Geronimo, 2004). Intense stress when it is not coped with effectively can lead to many different health problems physically and mentally. The current study evaluates the effects of mindfulness meditation with undergraduate students and it was expected that practicing mindfulness meditation would 1) reduce perceptions of stress, 2) increase perceptions of mindfulness, and 3) increase rates of acceptability in relation to mindfulness and meditation. It was also expected that an increase in compliance and acceptance would occur after experiencing the intervention. Thirty-one undergraduate students participated in an intervention, a 7-day phase of completing a survey on their meditation practice, and a 30-day follow up survey. There was no statistical significance between the Perceived Stress Scale (PSS) and Mindful Attention Awareness Scale (MAAS) at 30-day follow up from preintervention scores. However, students who continued meditation practice over the 7-day phase did see a significant outcome between the scores (p < .05) and students who practiced meditation highly valued the time they took each day. Students had decreased stress in the moment during the intervention from baseline stress levels (p < .01) and accepted deep breathing the most (p < .05). Students favored implementing a course into universities and did not have a significant change with their attitudes from post-intervention to 30-day follow up. Findings overall stayed consistent with the current literature and new questions were discussed for future implications.

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Mindfulness-Based Meditation and Its Effects on College Students

by

Jordan Sieja

A Senior Thesis Submitted to the

Eastern Michigan University

Honors College

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with Honors in Psychology

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MEDITATION AND STRESS

Abstract

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Mindfulness-Based Meditation and Its Effects on College Students

The causes, treatments, and prevention of stress have been studied immensely. Stress, which in many cases leads to a plethora of mental and physical health issues, is something almost everyone deals with daily and according to the American Psychological Association, “is becoming a public health crisis” (APA, n.d.). Colloquially there seems to be an understanding of the psychological, social, and biological effects stress has on our bodies. However, there is an overwhelming amount of people within the world who are uneducated and do not attempt to effectively cope with the stress they are facing (Thorpe, 2017). Specifically, college student’s stress levels are on the rise and this is due to the many demands placed on undergraduate students today (Hunt & Eisenberg, 2010). Knowing that so many people deal with the consequences of intense stress, many studies have been conducted to attempt to understand effective ways to combat the perception of stress to lessen the long-term effects it could have on the body. One system that has been consistently proven to be effective is mindfulness-based meditation and its overwhelming influence on decreasing perceptions of stress.

What is stress?

Stress is a perception that is unique within everyone’s situation. Because of this, stress is a word of many definitions. A book titled Measuring Stress: A Guide for Health and Social Scientists (Cohen, Kessler, & Gordon, 1998) discusses at the very beginning how the definition of stress is very inconsistent and highly depends on the person’s perception of the term and what is being measured and/or observed (Cohen et al., 1998). However, the authors did agree that most definitions share the commonality of, “A process in which environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological or biological changes that may place persons at risk for disease” (p. 3). Essentially, stress is a phenomenon that
demands more of us than we can adapt to in a given situation and if this lack of being able to adapt is consistent, chronic, or intense, it can lead to disease or mental and physical health problems.

Stress can affect us mentally and physically. However, stress starts as a physiological response. As discussed in Cohen's (1998) book, stress is what is known as the "fight or flight" response. They first discuss how the Sympathetic, Adrenal Medullary System, Hypothalamic, Pituitary, and Adrenocortical Axis are physiologically responding to the stress by releasing hormonal responses as ways to physically cope with the stress response. Stress also happens in three stages, which are known as the alarm stage, resistance stage, and exhaustion stage. These three stages represent the full cycle of a stress response that has been processed through our bodies mentally and physically. At the final stages of the model, they indicate that going through the stress cycle leads one to a higher risk of getting either a physical or psychiatric disease. Since stress is something that can be maladaptive, our bodies overall become more susceptible to mental and physical complications.

With stress being a predictor for disease, it is also discussed in this book that stressors are thought to cause negative affective states such as anxiety and depression, which lead to direct effects on our biological systems (Cohen et al., 1998). Students within university settings have been surveyed about their anxiety and depression, and a study done by Eisenberg et al. (2007) found that 15.6% of the undergraduate students who took the survey reported that they had a depressive or anxiety disorder and 13% of graduate students reported the same results. Due to their significant findings, they discussed the need for more reformation and change that address how universities handle their student's mental health. There is a need to bring in more innovative and effective solutions to the mental health and college crisis epidemic that is
occurring with our students across the nation, and possibly the world. Solutions that can be individualized and promote relaxation, coping mechanisms, social support, acceptance, and awareness are something to consider when dealing with a very specific and may be even confused community that is filled with individuals trying to become independent, learn what they want to do, and who they are.

**Stressors of College Students**

A book titled *College of the Overwhelmed: The Campus Mental Health Crisis and What to do About It* (Kadison & DiGeronimo, 2004) looks at the hardship’s students face in college, what causes these issues, and ways to cope and prevent them from occurring. One perspective the book spends a great deal of time on is the common stressors college students face. These factors include identity development, relationships, sexuality, roommate problems, academic pressures, extracurricular demands, parental expectations, and racial and cultural differences that affect self-worth. College, for many, is the first time young adults are becoming independent, experiencing new situations and lifestyles, taking on intensive work, and are learning who they are. However, it is very easy to take these positive changes or opportunities and turn them into a never-ending cycle of distress and constant hardships. Stress is something almost everyone deals with on a regular basis. For many however, stress can build up and become unhealthy if it is not dealt with in an effective manner.

What kind of negative attributes does stress create for college students? Many students engage in poor habits with the changes that come from starting college such as poor eating, less exercise, sleep deprivation, substance use, alcohol abuse, negative relationships, and lack of self-care. Trockel, Barnes, and Egget (2010) looked at the influence of certain health behaviors and the effects they had on GPA’s. The variables they used were exercise, eating, sleep habits, mood
states, perceived stress, time management, social support, number of hours worked per week, and spiritual or religious habits. The study found that the behaviors that had large variability were sleep habits, strength training, and study of spirituality-oriented material. They also found that more hours worked in a week led to lower grades as well as later wake-up times. This study suggests that students who engage in spiritual activities and exercise had a higher-grade average than the rest of the habits examined. With mindfulness meditation, there are exercises one can do that can incorporate both of these habits into their practice such as prayer and yoga. If students are able to find habits that they can individualize to their lifestyle that have been shown to have positive outcomes, there is a higher statistical chance they will be more successful in college and this could potentially lead to a decrease in perceived stress if their lifestyles have positive habits incorporated into them.

Are college students also becoming more depressed? A study done by Westefeld, McConnell, and Jenkins (2001) was interested in an answer to this question and found that 53% of their participants had experienced feelings of depression since they started college, and 9% of these participants had considered committing suicide since the start of college. With the demands that universities insist on students taking up within today's times, the stress keeps piling on. Although an older study, this epidemic is only growing and the study suggests that the demands of going to college are increasing mental health issues and are raising feelings of depression and thoughts of suicide significantly (Eisenberg et al., 2007). The need to take action is crucial and it is imperative to find programs, groups, and/or interventions that students can engage in to decrease these thoughts and feelings as they should not be a part of everyday life.

Something that not every student experiences, but should be a concern with the topic of stressors college students face is being an international student. Olivas and Li (2006) discussed a
phenomenon within the international student population in the United States and the common stressors they face such as adjusting to a new culture, language barriers, and lack of knowledge of the new culture. They discuss how the counseling systems at American universities are very traditional and do not work for much of the population attending the schools. They discuss how counseling needs to be more individualized and the need for options outside of the traditional route. Many of the international students emphasize how helpful social support between people of their own culture and American culture would be in reducing their perceived stress. They also discuss eight positive coping strategies found after surveying international students, with one of them being the act of “letting go”, a skill that many people claim to become significantly stronger through the practice of mindfulness meditation. They also emphasize the need for less formal interventions, and more groups with other students such as study groups to become familiar with the culture and for a sense of belongingness (Misra, Crist, & Burant, 2003). Since college is a place of diversity, there is a need for coping strategies that can be individualized, done alone or in a group setting, and tailored to everyone’s individual needs.

Another stressor many students face is poor sleep quality. Many students have reported disturbing sleep cycles and being sleep deprived. Sleep deprivation can cause not only physiological stress, but psychological stress as it can lead to a decrease in motivation, performance, and overall health. A study done by Lund, Reider, Whiting, and Prichard (2010) is an extension of the 2006 National Sleep Foundation examination of sleep. However, the current study examined older adolescents rather than young. They surveyed college students between the ages of 17 and 24 about sleep habits, academic performance, physical health, and psychoactive drug use. They had found that over 60% of the students were poor-sleepers and of the students that reported being a poor sleeper, there were significant increases in problems with
physical and mental health. They also found students reported that emotional and academic stress had a negative impact on their sleep. The study suggests at the end that there should be more research and interventions for sleep disturbances with college students.

If students could have experiences with less negative habits such as sleep disturbances and create an environment that promotes positive lifestyle approaches that allow for maximal performance, their stress could potentially significantly decrease. One exercise that could target many of the issues discussed thus far is mindfulness meditation, which can aid in eliminating these factors that are possibly causing intense and excessive stress. If mindfulness meditation could allow students to gain skills that target the root causes of their distress, which for an overwhelming number of students could be significantly beneficial in a number of ways, students could enhance their overall well-being through their physical and mental health.

What is Mindfulness-Based Meditation?

Mindfulness-based meditation can be defined as, “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). Mindfulness meditation has been shown to have many physiological and psychological benefits for most people through numerous studies that have been done. A study done by Brown and Ryan (2003) looked at the validity of the Mindful Attention Awareness Scale (MAAS), and had done multiple studies within this article to see if participant’s overall well-being and self-awareness were affected by being mindful in their daily lives. They looked at college students, adults, and cancer patients within their reported studies and had found that practice and intervention had heightened self-awareness, psychological well-being, and self-knowledge. They also found that mindfulness has value in the study of the temporal and situational dynamics of self-regulated behavior and well-
being (Brown & Ryan, 2003). Mindfulness is a skill that can be individualized and tailored to specific situations within day-to-day life that can be stress inducing. The effects can be minimized by implementing mindfulness and overall awareness of what is happening in the moment, without judgement, and out of our control.

Many mindfulness-based meditation exercises deal with using the physical body such as yoga, mindfulness walking, and deep breathing. One study by Caldwell, Harrison, Adams, Quin, and Greeson (2010) were interested in whether mindfulness would increase in movement-based courses, and if these courses affect self-efficacy, mood, and perceived stress. They also wanted to know if these influences would induce better sleep. They examined 166 college students in Pilates, Taiji Quan, and GYROKENESIS classes. The participants had to take self-assessment measures at the beginning, middle, and end of the semester within their classes on self-efficacy, mood, perceived stress, and sleep quality. What they had found is that the assessments improved overall, and that mindfulness was directly related to sleep improvements from the beginning of the semester. Overall, their study suggests that mindfulness mediates positive changes in perceived stress and mood, which could in part enhance one's sleep quality from those changes.

One habit that can lead college students to abuse alcohol is not effectively coping with their stress. This study by Bodenlos, Noonan, and Wells (2013) wanted to look at the relationship between mindfulness and alcohol problems in college students, while using stress as the mediator within the comparison. The participants completed self-assessments using the Perceived Stress Scale, the Five Faucet Mindfulness Questionnaire, and the Rutgers Alcohol Problems Index. What they had found was that mindfulness was negatively correlated with stress, and stress was positively correlated with alcohol problems. They concluded that it could be beneficial to incorporate mindfulness interventions or programs into college campuses to help combat stress,
which is potentially a strong indicator of why so many college students suffer from alcohol problems. Many of our habits form from the stress that we are put up against in our daily lives. If students can learn that there are other ways to cope with stress other than reckless behavior such as engaging in excessive alcohol consumption, then they are more likely to overcome the stress rather than add onto it with negative lifestyle habits.

One of the top stressors for college students is their grades and GPA’s. Since college is something that has become so popular and necessary for a job with a livable wage, many fields have become highly competitive. For many students, getting a high GPA is crucial to get a job out of college, or to get into graduate programs. Hall (1999) had conducted a study at Hampton University looking at the effects of meditation on academic performance with African American students. They conducted this in an introduction to psychology course and split the class up into two groups, one group receiving the meditation and the control group not receiving the intervention. What they had measured was GPA’s between the two groups. What they found was that the group that received the meditation practice every week had a significantly higher GPA at the end of the semester and had a significantly higher cumulative GPA. At the end they discuss how it could be beneficial to replace anxiety and stress provoking sessions, classes, and semesters with calm and relaxing interventions to help balance the amount of negative emotions and effects college tends to have on students. This study also suggests that it is not necessarily the material of the courses that makes student’s GPA drop, but the stress, environment, and lack of knowledge of how to cope with the stress that comes with the course load.

Overall, mindfulness meditation interventions and techniques have many benefits and skills that become handy and crucial for success within college students. However, universities do not promote this opportunity to deal with stress and the many obstacles college students face
such as mental and physical illness, social support, lifestyle, and their overall well-being. Many students are also not educated on the topic of using mindfulness meditation to help them cope with their stressors unless they take major or minor specific classes. The studies mentioned give examples as to how this skill can be handy in so many areas of a student's life and how individualized and progressive it can be. It is possible to see a change in attitudes, lifestyle, and student's overall well-being if this one change can be made within the university system. There is a need for more classes or programs to be offered that students can take on how to cope and reduce stressors that negatively affect their academic career.

**Biological Benefits of Mindfulness**

Mindfulness meditation is something that has been implemented and practiced in medicine for some time. An article on *The Jama Network* by Ludwig and J. Kabat-Zinn (2008) discussed the topic of mindfulness meditation in medicine and how forms of meditation can influence our susceptibility or ability to recover from disability and disease. They state in the article,

> These may include (1) decreased perception of pain severity; (2) increased ability to tolerate pain or disability; (3) reduced stress, anxiety, or depression; (4) diminished usage of, and thereby reduced adverse effects from analgesic, anxiolytic, or antidepressant medication; (5) enhanced ability to reflect on choices regarding medical treatments (eg, decision to seek a second opinion); (6) improved adherence to medical treatments; (7) increased motivation for lifestyle changes involving diet, physical activity, smoking cessation, or other behaviors; (8) enriched interpersonal relationships and social connectedness; and (9) alterations in biological pathways affecting health, such as the autonomic nervous system, neuroendocrine function, and the immune system. Most of
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these possibilities have not been rigorously examined. Nevertheless, psychological stress has been linked to numerous medical conditions (p. 1351).

Many of the points made in this article indicate a change biologically within one's physiological processes that are beneficial to the patient such as no longer needing antidepressants or assistance through medicine to cope with changes in the body such as producing a balance of hormones. There are also behavioral changes that come with the mindfulness meditation process that create better biological outcomes for people engaging in the practice such as diet, exercise, and decrease in substance use. If one has lifestyle changes that are connected to healthier outcomes such as eating better foods or getting enough physical activity, the body becomes more energized and resilient to stressors of everyday life and the body can handle more stress with less negative consequences. As mentioned previously in this review, physiological responses to stress can create negative psychological outcomes such as anxiety, depression, mood disorders, and chronic stress over time. This current article discusses that if stressors are perceived differently over time with the practice of mindfulness meditation, then one's body can physiologically change over time as the mind adapts to this new perception and outlook on life.

As mentioned before, college students are at a significant risk of developing mental health conditions such as depression and anxiety. This can be due to many different factors such as lifestyle choices and changes since they had started at a university. Factors that have been mentioned thus far are sleep disturbances, diet, physical activity, coping mechanisms, stress, drug/alcohol consumption, time management, and overall lack of self-care. Many students turn to temporary fixes such as drug/alcohol consumption, medicine, and/or ignoring the problem because the options available to create positive lifestyle change or ways to cope with stress are limited. As the previous article states, there is extensive research on this area of study dealing
with mindfulness meditation and it being replaced with medicine in certain scenarios. Because it has been shown that this form of intervention has worked for so many of the variables that cause turmoil within university students, it is important that more research and implementation is done with these different meditation interventions. Students need reliable, individualized, and effective ways to cope with the stressors they are facing within their academic career, and this technique is one that shows improvements and significant results across the board.

Memory in an academic setting is important for students' success. An area of research conducted by Zeidan, Johnson, Diamond, David, and Goolkasian (2010) examined mindfulness meditation and if it had an effect with short-term practice on cognition and mood compared to a control group. Their methodology was to have the intervention group complete four sessions of meditation training and the control group listen to a recorded book. Both groups after the sessions were measured based on mood, verbal fluency, visual coding, and working memory. They found that both interventions were effective at improving mood. However, only the meditation training group had reduced fatigue, anxiety, and increased mindfulness. Mindfulness meditation also significantly improved visuo-spatial processing, working memory, and executive functioning. They concluded that the four-day meditation intervention could enhance the participants' ability to sustain attention, which has been previously reported to be present with long-term meditators. This study suggests not only that mindfulness meditation can improve attention, but that the practice does not have to be long-term to see significant results. Of course, long-term practice would help maintain the results and create more positive outcomes. However, short-term progress may keep people on board with the practice if they see results quickly, rather than having to wait a long period of time to notice a difference with their well-being and
biological changes. The biology of how one perceives these notions starts to change early on, which demonstrates how powerful and fast acting being mindful can be.

Stress releases a hormone known as Cortisol, and this hormone can create great disruptions within the body if it is released too much over time such as contributing to heart conditions, lower immunity, high blood sugar, and hypertension (APA, 2018). However, it has been demonstrated that mindfulness meditation has decreased the amount of cortisol released within the body over time (Turakitwanakan, Mekseepralard, & Busarakumtragul, 2013). Turakitwanakan et al., (2013) wanted to understand if mindfulness meditation decreased serum cortisol levels in medical students. The program had significantly lowered both perceived stress and cortisol levels for the students. Due to the lowering of cortisol levels, they discussed how this could decrease their chance of developing diseases and that mindfulness meditation should be used with standard treatment. As mentioned, cortisol can become dangerous to the body if it is released at excessive levels consistently. Since college students are usually under high amounts of stress, there is potential that this hormone is creating disruptions to their physical and mental health over time. However, if students were encouraged to engage in mindfulness meditation through a class or activity, there is potential for them to combat the negative side effects of the cortisol hormone. This could save them from complications down the road in their lives, would allow them to have more life satisfaction, and overall less stress than they would have if they did not practice mindfulness meditation.

Overall, biological and physiological responses play a huge factor in our perceptions and how we learn to cope with stress overall. However, mindfulness meditation, an exercise that has been shown to have significant effects on one’s overall well-being through changes in their biological systems over time, is still not a popular form of support that many universities see on
their campus. With the evidence that has been given time and time again, there is a need to create more groups, classes, or options that are readily available for students to try, so there can be more research on how students feel about the programs and so it is possible to measure if there is a change with the stress epidemic in universities that consistently occur.

Benefits of Implementing Meditation in Academic Settings

There have been many benefits found in studies regarding the question if implementing mindfulness meditation into higher education is worth the time and mental health of students. A meta-analysis by Shapiro, Brown, and Astin (2008) evaluated empirical evidence for the use of meditation, how it facilitates the achievement of educational goals, and how this helps with student’s mental health under academic stress. They also wanted to see if meditation enhances the education of the “whole person”, this meaning their education experience overall. They looked at four decades of research that examined specifically two types of meditation, which were mindfulness meditation and concentration-based meditation. They were interested in how these types improved important cognitive skills of attention and information processing. They also wanted to see how the two types worked as an aid to help build participants stress resilience and adaptive interpersonal capacities. What they had found for cognitive and academic performance with the use of mindfulness meditation was that it may improve ability to maintain preparedness and attention, as well as ability to process information quickly and accurately. For concentration-based meditation, they found over a long period of practice that it could have a positive impact on academic achievement. They also found that the mental health and psychological well-being of participants who practiced mindfulness meditation showed a decrease stress, anxiety, and depression. They also found that mindfulness meditation could aid in the regulation of emotional reactions and the cultivation of positive psychological states.
Lastly, what they had found for the development of the whole person was that meditation could enhance one's creativity, skills needed for interpersonal relationships, empathetic responses, and self-compassion. This study has found many beneficial skills to help college students achieve success throughout their academic career and they found many studies had shown that it improves one's overall well-being. With this study alone, there are many beneficial factors that create a well-rounded perspective for students to help set them up for their personal organization, mental health, relationships, concentration, preparedness, and emotion regulation. All of these categories have potential to be linked to a lot of the stress that college students face, as well as the general population. Because so many different positive outcomes come from mindfulness meditation and it can be individualized, there should be further research and programs at colleges for students to join that implement meditation. This would enhance student's successes and improve their overall well-being, which is important to mediate negative affect and stressful situations.

Keogh, Bond, and Flaxman (2006) were interested in looking at a cognitive behavioral based stress management intervention and if this intervention would increase the functionality of cognitions and better one's mental health. They had 209 participants who were randomized either into a group receiving the intervention or a group receiving no treatment. They were measured pre-and post-intervention and were given academic assessments after the intervention was completed that were suited for the age and academic experience of the students. What they found was that the group who received the intervention did have an increase in their functionality of cognitions and their mental health was improved. They also found that the intervention group had an increase in motivation that they believe accounted for the significantly better performance on the academic assessments compared to the control group. This study implies that improving
stress management skills can enhance one’s motivation, which is potentially an important skill for students to have to complete their degree and be successful within the competitions that come along with their field of study post-graduation as well.

Distress, rumination, and distractions have all been examined with the practice of mindfulness meditation. These traits are something many of us deal with on a regular basis and can be important to review in college students. Jain et al. (2007) conducted a study that looked at the effects of a one-month mindfulness meditation intervention versus a somatic relaxation training program, with both compared to a control group. They wanted to see the effects each of these programs had on distress, positive states of mind, rumination, distractions, and spiritual experiences. What they found was that the meditation and relaxation groups had significant decreases in distress and increases in positive mood states compared to the control group. The effect sizes were large for the changes as well. However, the meditation group had a larger effect size for positive states of mind than the relaxation training did. The meditation group also showed decreases in both distractive and ruminative thoughts compared to the control group. Lastly, they did not find any significant changes in spiritual experiences. They concluded that both mindfulness meditation and somatic relaxation training reduces distress and increases positive mood states, but mindfulness meditation is specifically beneficial in reducing distractive and ruminating thoughts and could have its own unique way of reducing distress. Students tend to have ruminating thoughts and distractions such as wondering why they did not do better on an exam or become too focused on other aspects of their lives outside of their academic career. These thoughts and behaviors can take away from their full experience as a student and can affect their academic success overall. There are multiple forms of interventions that have been mentioned in this review that establish how many of the obstacles students face can be reworked
and managed through forms of mindfulness. It is also important to note from this study that
spiritual experiences were not changed through either of these programs. One does not need to
be spiritual to benefit from these interventions; they can relax and become mindful of themselves
through their own mind, and it does not necessarily have to come from spirituality.

As previously mentioned, due to distress in college settings, many students take up
unhealthy habits to cope with their stress. One coping mechanism for many students is smoking.
To see if mindfulness meditation could decrease the amount of smoking within the college
student population, a study conducted by Bowen and Marlatt (2009) looked at a meditation
called "urge surfing" to measure the effects it has on smoking-related urges and behavior. It is
important to note that the students were interested in quitting, but they had not been through any
smoking cessation programs prior to this study. There were two groups; one of them received
the "urge-surfing" intervention and the other received no instruction. The results they found did
not show significant change in the urges the students were experiencing. However, the group
that received the intervention had smoked significantly less cigarettes at the 7-day follow up after
the intervention compared to the no-instruction group. They suggest at the end of the study that
using mindfulness meditation practice does not necessarily lessen the perception of urges, but
could change the response to their urges. This study is exceptional for understanding why it
would be highly beneficial and necessary to incorporate mindfulness meditation into college
campuses. As mentioned before, many students face multiple stressors on a day-to-day basis and
they also do not cope well with the amount of distress they are facing. Additionally, many
students cope poorly with stress because they have not been taught how to cope efficiently. With
this study, it is shown that the intervention had changed the responses to the urges the
participants were having. It is well known that stress is a predictor of whether people will take
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on habits such as heavy drinking and smoking (Sinha, 2001). If mindfulness meditation can decrease the stress causing the use of substances, we are not only targeting the poor coping choices, but the root cause of picking up the habits as well. If students can learn the importance of making choices that will lead to their mental, physical, and real-world successes, then better habits and overall well-being could follow with practice.

Fields of study that deal with services such as psychology, medical, teaching, and business are areas of work that usually require people to create effective relationships with their clients and coworkers. They also require people to have stable emotional states, which includes having a handle on their stress responses in professional settings. An approach by Schure, Christopher, and Christopher (2008) involved a 4-year qualitative study with graduate students studying either psychotherapy, counseling, or behavioral medicine. They created a class for the 15-week semester and wanted to look at the influences of hatha yoga, meditation, and qigong on the student’s mental and physical health. They practiced the different meditation interventions in class every week and at the end of the semester were required to answer four questions regarding their experience. The responses had themes in which students felt the practice had positive effects on aspects of themselves such as their physical, emotional, mental, spiritual, and interpersonal situations. Many of them had also discussed how they were less sick than usual while taking the course. The students reported being able to cope with negative affect better than they were prior to the course, while also demonstrating that they had increased clarity of thought and capacity for reflection. The students also reported that they perceived themselves to have more empathy and compassion. An important factor of this study is gaining insight from the experiences of students engaging in the practices rather than solely reporting surveys that are interpreted quantitatively. The students overall found the practice highly beneficial for their
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overall well-being and reported many positive outcomes that they felt benefitted their overall life and semester experience. Because there are so many benefits from practicing mindfulness meditation that specifically tailor to student’s success and overall well-being, and students appreciated the course being offered and what they got out of it, there should be a considerable amount of thought about implementing more of these programs in the university setting.

Overall, the review of the literature demonstrates the importance of understanding stress within university students. The benefits of mindfulness meditation have also been extensively reviewed for the influence the practice has on attitudes and perceptions of stress within university students. The need for new and innovative programs that incorporate mindfulness meditation practice within universities and for students to become educated on the importance of effectively coping with stress has been somewhat reviewed. However, the question has had minimal direct examination in the literature. It is important that more research is done to understand how mindfulness meditation practice benefits university students and their acceptability to the idea of implementing material and courses to learn about the topic of stress and mindfulness meditation.

Hypotheses

Although there has been an exceptional amount of research done to examine the effects of mindfulness meditation on one’s mental and physical health, and overall well-being, understanding how this practice alleviates stress within undergraduate college students specifically is less understood. It is also minimally understood how students’ attitudes reflect the practice of mindfulness meditation over other options that universities have available for student help or social connection. To this reviewer’s knowledge, the question of whether students would be motivated or desired to take a course for graduation credit on understanding and learning to
cope with stress through mindfulness meditation techniques has not been examined directly. The current study examined undergraduate students on the basis of learning about the effects of stress and coping with stress through mindfulness meditation practice, and if these factors had an effect on 1) stress, 2) mindfulness, and 3) acceptability to mindfulness.

It was hypothesized that undergraduate students who engage in this intervention about coping with stress though practicing mindfulness meditation exercises would experience 1) reduced perceptions of stress, 2) increased perceptions of mindfulness, and 3) increased rates of acceptability in relation to mindfulness and meditation. It was expected that students would favor implementing a program into universities that allows for a class based on learning about and practicing mindfulness meditation to earn credit toward a graduation requirement. It was also expected that students would desire learning about effective ways to cope with stress and value knowledge that benefits their lifestyles and ability to handle stressors in their lives.

This study also examined the motivation behind participant’s compliance and changes in perceptions from learning ways to cope with their stress through mindfulness meditation exercises. It was hypothesized that the desire to comply and engage in various mindfulness meditation exercises due to acceptability will increase after having experienced the presentation and intervention together. The results were measured through each student’s acceptability for each exercise, a post-intervention questionnaire, and a 7-day phase where participants document their meditation practice, stress, and if they valued the practice if it was completed each day.
Method

Participants

For the current study, Eastern Michigan University undergraduate students were asked to participate. Students found out about this study through an email that was sent out to undergraduate students regarding the project, through the Eastern Michigan University SONA research system, and through visits in various courses from the researcher responsible for this project. Students who were interested in participating were asked to sign up through an email sent to them or through the SONA research system, which contained a questionnaire. If someone chose to sign up, they were asked to take a brief questionnaire as a screening process about their experience with mindfulness meditation. For an in-depth description of what was asked during the screening process, please refer to appendix A. All participants were asked to give consent prior to any initiation of this study. Participants were able to sign up for the intervention over multiple time slots of no more than 30 students per slot.

Materials

The materials that were used throughout the study are as follows:

SPSS, which is a test analysis software to measure any statistical tests evaluated for data collection (IBM, 2017). The software computed data the study was measuring from questionnaires taken, which were the Perceived Stress Scale (PSS), Subjective Units of Distress Scale (SUDS), Mindful Attention Awareness Scale (MAAS), and any Likert-Scale questions. SPSS is a reliable software that aids in computing significant findings within the study.

R and RStudio, which is another test analysis software that was used to measure any statistical tests evaluated for data collection. The software computed data the study was measuring from questionnaires evaluated, which were the PSS, SUDS, MAAS, and any Likert-
Scale questions. R is a newer software for statistical evaluations, but is a powerful tool that can be useful for complex statistics (n.d.).

Microsoft PowerPoint was used to give participants a short presentation on how stress influences our mental and physical behavior, and lifestyle in general. The data that was used to create this presentation were from studies discussed in the literature review of the current study. The presentation was thought to further the success of the intervention through educating the participants on the importance of coping with stress effectively.

Qualtrics Survey Software was used for all questionnaires related to the project. The questionnaires were sent through links to participants' emails or phone numbers, depending on the phase of the study. Qualtrics is a reliable software used in many academic settings to aid in computing results of participants' responses (Qualtrics, 2018).

Data 24/7 is a website that allows emails to be synced up with a phone number. This was used within this study to be able to send emails via text messages for the daily follow up messages that participants received. Data 24/7 allowed communication to be consistent and of easy access for the participants since the responses could be done on their phones (Data 24/7, 2018).

The exercises that were taught to the participants have been shown to positively affect anxieties and stress that people tend to face within their lives. The exercises come from guided meditations created by Jon Kabat-Zinn and are exercises such as body scans, deep breathing, and imagery (n.d.). The exercises used have been validated and shown reliable in achieving positive benefits from practice.
Measures

**Perceived Stress Scale (PSS).** The Perceived Stress Scale (PSS) was used to receive data on participant's perceived stress within their lives such as how unpredictable, uncontrollable, and overwhelmed they feel they are in their everyday lives (Cohen, n.d.). Scores were obtained by reversing responses to the four positively stated items (4, 5, 7, and 8) and then summed across all 10 items. Example items included, "In the last month, how often have you felt nervous and 'stressed'?" and "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?". Responses ranged from 0 “never” to 4 “very often” and the lower the score, the less perceived stress one is experiencing. The questionnaire has been primarily used to measure perceived stress from anyone with at least a junior high education level, but has been vastly used with university students and shown to be valid and reliable across the college student population (Roberti, Harrington, & Storch, 2006). This tool was used prior to the intervention to understand where the participants perceive their stress levels to be and for the 30-day follow up data to measure any differences in perceived stress due to the intervention and post-practice of mindfulness meditation. This scale is the most widely used tool within psychology to measure perceived stress individuals face and as stated by Cohen (n.d.) this measure is designed for community samples, the items are easy to understand, and are free of any specific content for any specific subgroup.

**Mindful Attention Awareness Scale (MAAS).** The Mindful Attention Awareness Scale (MAAS) is a tool that was used to understand where participants believed their competence to be with the skill of mindfulness in their daily lives. It is a 15-item questionnaire assessing the frequency with which an individual is openly attentive to, and aware of present events and experiences (Shapiro, Brown, & Biegel, 2007). Example items included, "I break or spill things..."
because of carelessness, not paying attention, or thinking of something else” and “I tend not to notice feelings of physical tension or discomfort until they really grab my attention”. Scores were obtained by averaging scores across all items and individual items ranged from 1 “almost always” to 6 “almost never”. The higher the score was, the more mindful someone believed themselves to be. The MAAS has shown strong psychometric properties, has been vastly used with college students, and has been shown to be valid and reliable within a university setting (Brown & Ryan, 2003; Tanay & Bernstein, 2013). This measure was used during the pre-intervention phase and for the 30-day follow up questionnaire to evaluate participant’s competence before and after the students learned skills to increase mindfulness.

**Subjective Units of Distress Scale (SUDS).** The Subjective Units of Distress Scale (SUDS) is a one-item scale that measures in the moment perceived stress (SUDS, 2018). Responses ranged from 0 “no distress; totally relaxed” to 10 “highest distress that you have ever felt”. The scale is used to understand and measure fluctuations in participant’s perceived stress levels. This was administered before the intervention, after every mindfulness meditation exercise, once the intervention was complete, and every day during the 7-day period when participants were receiving daily messages about their mindfulness meditation experience. This scale has been widely used due to its validity and reliability within psychology and can be thought of as a “distress monitor” that shows participants how their levels of distress change over time and in different situations (SUDS, 2018).

**Additional questionnaires.** A few nominal questions were asked in the post-intervention and 30-day follow up questionnaire to better understand how the participants felt about learning these exercises and their thoughts about future implications in courses on the subject. The questionnaire used for screening was also sent to the participants when they received their
invitation to be a part of the study. The questions and screening questionnaire can be found in appendices A, B and C for reference. One goal of this study was to understand if students would appreciate this alternative solution to better cope with their stress during their college experience.

**Acceptability questionnaire.** After every exercise during the intervention, the participants filled out a questionnaire that had a question regarding their rating of the current exercise to indicate their acceptability to the practice and the SUDS scale. Please refer to appendix D to see the questions that were asked.

**Post-intervention questionnaire.** The post-intervention questionnaire asked students to answer a few questions about their experience and thoughts with the intervention. One example question would be thoughts about implementing courses for graduation credit to learn about strategies such as mindfulness meditation to better cope with the stress of college and their daily lives. Another example question would be if they are perceiving a decrease in stress in the current moment due to the intervention. For other questions asked, please refer to appendix B for what questions were asked in the post-intervention survey.

**Daily survey.** The daily survey was sent to participants for seven days following the in-person intervention. The survey asked various questions such as if they practiced any form of mindfulness meditation each day and how stressed they have felt throughout the day with the SUDS scale. The 7-day self-report phase of the study also included who engaged with mindfulness meditation, how many times students practiced, and differences in stress and mindfulness levels between those who practiced mindfulness meditation versus those who did not. For an in-depth description of the questions that were asked during the 7-day phase, please refer to appendix E.
**30-day follow up questionnaire.** The 30-day follow up questionnaire was similar to the post-intervention questionnaire. However, there were a few more questions added to this survey that discuss what participants have done beyond the intervention and their current thoughts about coping with stress through mindfulness meditation. For a list of the questions, refer to appendix C for further details.

**Procedure**

Once the participants were screened and agreed to be a part of the study, they met with the researcher and instructor of the mindfulness exercises on one of the specified days they chose based on dates given to conduct the intervention. The first task the participants engaged in was taking pre-intervention questionnaires. The questionnaires were as follows: PSS, MAAS, and the SUDS scale. This enabled the researcher to specify how much experience the participants had with mindfulness and coping with stress effectively. As stated previously, participants who were a part of the study potentially had different levels of experience with mindfulness and meditation, so it was important to get a baseline for where the participants stood with their experience of being mindful prior to the intervention.

After all the pre-intervention questionnaires were taken, all groups were given a short presentation on the effects of stress untreated, specifically in university populations. The presentation covered areas such as lifestyles, and the physical and mental impacts of stress based on research found for this study. Next, participants engaged in a 30-minute session of various mindfulness meditation exercises. These exercises were put together and instructed by doctoral students at Eastern Michigan University with prior experience of guiding mindfulness meditation exercises, or the researcher. The exercises practiced were a body scan, deep breathing, and
imagery. Once the 30-minute session was complete, the students were asked to take the post-intervention questionnaires, which were the SUDS scale and a post-intervention questionnaire.

For seven days after the intervention, participants were sent a daily survey through an email-to-text message service regarding their meditation practice throughout the week. Finally, participants were sent a follow-up message once 30 days passed since the in-person intervention. They were asked to fill out the PSS, MAAS, and questions from a 30-day follow-up survey created specifically for this study, which were similar to the post-intervention questions.

Results

The current study had a sample size of 31 students with 22 participants (71%) identifying as female, 25 (80.7%) students being between the ages of 18-20, and 21 students identifying as white (67.7%). Thirty of the students (96.8%) reported having a full-time enrollment status with 18 (58.1%) of the students also working part-time. Please see Table 1 for full demographic information. Of the 31 students, 27 (87.1%) students did not currently practice mindfulness meditation with 25 (80.7%) students specifically having no significant experiences with practicing meditation. Only three (9.7%) of the students who indicated having significant training stated they currently practice meditation regularly. Twenty-three students (74.2%) indicated they were not currently in any treatment, therapy, or counseling for psychological help.

Table 1

<table>
<thead>
<tr>
<th>Sociodemographic Variables (N= 31)</th>
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<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>n</td>
</tr>
</tbody>
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### Gender

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<td>Female</td>
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<td>71</td>
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<td>Other</td>
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### Race

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<td>3.2</td>
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### Ethnicity

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<tr>
<td>White</td>
<td>23</td>
<td>74.2</td>
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<tr>
<td>African American</td>
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<tr>
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<td>3.2</td>
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### Employment

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<tr>
<td>Part-time</td>
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<tr>
<td>Unemployed</td>
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### Enrollment

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</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>30</td>
<td>96.8</td>
</tr>
<tr>
<td>Part-time</td>
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<td>3.2</td>
</tr>
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### Practice Meditation Regularly

<table>
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<th>No</th>
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<tbody>
<tr>
<td>Yes</td>
<td>4</td>
<td>12.9</td>
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</table>
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No 27 87.1

Type of Significant Training in Meditation

<table>
<thead>
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<th>Training</th>
<th>25</th>
<th>80.7</th>
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</thead>
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<td>No Training</td>
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<tr>
<td>Educational Class</td>
<td>1</td>
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</tr>
<tr>
<td>Therapy</td>
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<td>3.2</td>
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<tr>
<td>Yoga</td>
<td>3</td>
<td>9.7</td>
</tr>
<tr>
<td>Other</td>
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<td>3.2</td>
</tr>
</tbody>
</table>

Currently Practice Significant Training

<table>
<thead>
<tr>
<th>Practice</th>
<th>3</th>
<th>9.7</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>16.1</td>
</tr>
<tr>
<td>Sometimes</td>
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<td>35.5</td>
</tr>
<tr>
<td>Not Applicable</td>
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<td>38.7</td>
</tr>
</tbody>
</table>

Currently Receiving Psychological Help

<table>
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<th>Help</th>
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</thead>
<tbody>
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<td></td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>74.2</td>
</tr>
</tbody>
</table>

Notes. N = sample size, M = mean, SD = standard deviation

Preliminary Analyses

All data collected from self-report questionnaires were entered, coded, and examined through Microsoft Excel, SPSS, and RStudio. Data were analyzed with RStudio through various statistical evaluations to understand if hypotheses were upheld. A repeated-measures ANOVA was used to measure changes from the PSS and MAAS scores when participants took them at pre-intervention and 30-day follow up. The SUDS questionnaire at pre-intervention and between each exercise during the intervention was examined through a repeated-measures ANOVA to
understand changes in stress throughout the intervention. Acceptability to each exercise during the intervention was measured through a repeated-measures ANOVA to understand if certain exercises demonstrated differences in acceptability to mindfulness and meditation. To evaluate the question if students would like to see courses implemented into universities to learn to cope with stress through exercises such as mindfulness meditation, a repeated-measures ANOVA at post-intervention and 30-day follow up was examined.

There was no statistical significance found for the repeated-measures ANOVA to examine data from the PSS ($p = .097$) and MAAS ($p = .076$) at pre-intervention and 30-day follow up. However, the MAAS was approaching statistical significance, which indicates that after experiencing the intervention mindfulness scores generally increased. Specifically, those who practiced most (4-7) days had higher MAAS scores compared to those who practiced only some (1-3) days ($p < .05$). There was no statistical significance found between groups with the PSS.

Table 2

<table>
<thead>
<tr>
<th>Source</th>
<th>MAAS</th>
<th>PSS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SS</td>
<td>dF</td>
</tr>
<tr>
<td>Within Subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
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<td>1</td>
</tr>
<tr>
<td>Error</td>
<td>0.057</td>
<td>1</td>
</tr>
</tbody>
</table>

*Notes. SS = Sum of Squares, dF = Degrees of Freedom, MS = Mean of Squares*

Although no statistical significance was shown overall for the PSS and MAAS scale, there was statistical significance in changes between pre-intervention scores and at 30-day follow
up as students continued to practice throughout the 7-day self-report phase compared to students who did not continue to practice mindfulness meditation for both the MAAS \( (p < .05) \) and PSS \( (p = .05) \). Examined through a regression, it is apparent that the more one practiced mindfulness meditation, the lower their PSS score and the higher their MAAS score was overall.

Table 3

<table>
<thead>
<tr>
<th>Predictors</th>
<th>PSS</th>
<th></th>
<th></th>
<th></th>
<th>MAAS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>SE</td>
<td>B</td>
<td>t</td>
<td>p</td>
<td>b</td>
<td>SE</td>
<td>B</td>
</tr>
<tr>
<td>(Constant)</td>
<td>23.223</td>
<td>2.001</td>
<td>11.063</td>
<td>.000</td>
<td>3.247</td>
<td>.226</td>
<td>14.376</td>
<td>.000</td>
</tr>
<tr>
<td>Total Practice</td>
<td>-1.295</td>
<td>.633</td>
<td>-0.408</td>
<td>-2.047</td>
<td>.053*</td>
<td>0.186</td>
<td>.073</td>
<td>0.478</td>
</tr>
</tbody>
</table>

Notes: \( b \) = unstandardized betas, \( SE \) = Standard errors, \( B \) = standardized betas, \( *p < .05 \)

When examining stress levels during the intervention, there was statistical significance between pre-intervention SUDS reports and every SUDS report completed during the intervention after each exercise \( (p = < .01) \) with the largest changes happening between pre-intervention and imagery \( (p = < .01) \), which was the last exercise to be completed. Stress was shown to be significantly lower in the moment during the intervention overall compared to pre-intervention responses and was sustained throughout the intervention.

Figure 1
Notes. **p < .01, SUDS scale ratings 1-10 (no distress to extreme distress)

Acceptability to mindfulness showed statistical significance (p < .05) during each self-report between exercises. Specifically, students accepted deep breathing more compared to imagery (p = .004). Acceptability between deep breathing and body scan also showed statistical significance (p = .0170) with deep breathing still showing higher acceptability. There was no statistical significance between body scan and imagery (p = .8421), so the most accepted exercise was deep breathing (M = 5.94, Agree).

Figure 2

Acceptability to Exercise Self-Report During Intervention

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Breathing</td>
<td>5.94</td>
</tr>
<tr>
<td>Body Scan</td>
<td>5.26*</td>
</tr>
<tr>
<td>Imagery</td>
<td>5.19*</td>
</tr>
</tbody>
</table>

Notes. *p < .05, acceptability ratings from 1-7 (strongly disagree to strongly agree)

For the question regarding if students would want to see a course implemented into universities for students to learn effective ways to cope with stress such as through mindfulness meditation, there was no statistical significance (p = .12), which shows that students did not change their attitudes about the question between post-intervention and the 30-day follow up self-report. Students overall favored implementing a course (M = 5.52, Agree) and attitudes about the question stayed consistent.
Students overall valued learning effective ways to cope with stress through mindfulness meditation ($M = 5.87$; Agree) after experiencing the intervention, which was recorded during the post-intervention questionnaire. To further understand if students valued and accepted learning about mindfulness meditation, results from the 7-day phase of the study show that most students (45.2%) practiced 1-3 days of the 7-day phase, with participants overall agreeing they valued the time they spent practicing mindfulness meditation ($M = 6.5$; Strongly Agree).

Table 4

*Seven-Day Self-Report Outcomes ($N = 31$)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants who Practiced Most Days</td>
<td>10</td>
<td>32.2</td>
</tr>
<tr>
<td>Participants who Practiced 1-3 Days</td>
<td>14</td>
<td>45.2</td>
</tr>
<tr>
<td>Participants who Practiced No Days</td>
<td>7</td>
<td>22.6</td>
</tr>
</tbody>
</table>

*Notes. N = sample size*
Discussion

Previous literature has demonstrated consistent findings that mindfulness meditation was able to reduce perceptions of stress and increase mindfulness (Lemay, Hoolahan, & Buchanan, 2018; Lacaille et al., 2017). The current study's primary hypothesis of understanding if a psycho-education presentation and mindfulness meditation intervention reduced stress and increased mindfulness after experiencing the presentation and intervention together was not proven. However, scores for the MAAS scale compared at pre-intervention and 30-day follow up were approaching statistical significance, and the results trended toward an increase in mindfulness. Not every student had participated in the 30-day follow up (77% response rate), which could have skewed the data to indicate higher or lower levels of stress and/or mindfulness. Additionally, students potentially took the 30-day follow up questionnaires at a time of high academic stress during midterms or finals week, whereas the pre-intervention questionnaires were taken during the beginning or middle of the semester. Although the current study did not indicate statistical significance, there are many studies in the literature that report mindfulness meditation decreasing one's stress over time (Lemay, Hoolahan, & Buchanan, 2018; Lacaille et al., 2017; Jain et al., 2007).

Although there was no statistical significance found for the PSS and MAAS, a regression did show a significant change as students continued to practice throughout the 7-day phase of the study. As practice increased during the 7-day phase, individuals indicated being less stressed on the PSS and more mindful on the MAAS. These results stay consistent with the literature, which discussed previously shows consistent findings that mindfulness meditation decreases stress and
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increases mindfulness over time (Lemay, Hoolahan, & Buchanan, 2018; Lacaille et al., 2017; Jain et al., 2007) This difference in application could explain why there was no statistical significance found overall for both the PSS and MAAS, but the MAAS was approaching statistical significance and showed a trend towards an increase in mindfulness. A low sample size and missing data for the 30-day follow up could have also influenced the outcome of the repeated-measures ANOVA and significance findings. Overall, if students engaged in the intervention and continued to practice after, they perceived an increase in mindfulness and a decrease in stress.

During the in-person intervention, there was a significant decrease in stress from when participants completed their baseline SUDS report to the rest of the SUDS reports between each exercise. Knowing this information, there is an overall trend of students perceiving less stress in the moment when practicing mindfulness meditation exercises. Perceiving less stress overall in one’s life may take consistent and long-term practice (Brennan & Simone, 2018). However, benefits from mindfulness meditation exercises in the moment were shown to be present and consistent with the current literature. The largest decrease in stress as noted was from baseline to the first exercise being completed. However, stress levels continued to stay minimum throughout the entire intervention, which was expected to occur based on previous studies and from creating a state of calmness through the meditation exercises. The lowest average score for SUDS ratings was during the last exercise, which also demonstrates as the intervention went on, stress levels either stayed consistent or continued to drop. It was not expected to find significant differences as the intervention went on, but to see consistently lower scores from baseline. Previous studies also discuss a decrease in stress during the exercise, which has been beneficial for participants to notice the effects of mindfulness meditation right away (Shearer et al., 2016). The exercises that
were used have been proven to be effective and demonstrated consistent results regarding moment stress levels.

Acceptability to mindfulness fluctuated between each exercise, with deep breathing being the most accepted exercise practiced. However, deep breathing was consistently the first exercise practiced throughout each intervention, meaning the acceptance rates for deep breathing could have been a product of an order effect. If the most accepted exercise was done first, then this could influence the responses for stress levels and perceptions of acceptability for every other exercise, depending on how much one accepted the latter two exercises compared to the initial exercise. Imagery was the least accepted exercise, which was also the last exercise to be completed during each intervention session. To this reviewer’s knowledge, there are not many studies within the literature that specify certain mindfulness meditation exercises producing different outcomes based on factors such as stress, mindfulness, and acceptance (Lindsay et al., 2018). However, deep breathing is more versatile and easier to practice in most situations. It could potentially be beneficial to understand in the future if certain meditation exercises are preferred with different contexts, age groups, genders, education levels, etc. to gain insight as to what practice harvests the greatest benefits for an individual. Acceptance levels are important to understand as this factor could lead to higher or lower stress levels with the participants.

An important question that has not been studied or evaluated directly in the literature is whether students would like to see courses implemented into universities that allow for a class based on learning about and practicing mindfulness meditation to earn credit toward a graduation requirement. There was no statistical significance found between responses at post-intervention and 30-day follow up, which demonstrates that students consistently agreed that they would want to see a course implemented. Because students also valued learning effective ways to cope with
their stress through mindfulness meditation, agreeing to this statement was expected, especially in such a high-stress population. There are not many opportunities for students to formally learn about ways to cope with stress in their life, and this study shows the importance of continuing to answer this question and take it into consideration the well-being and values of future university students. Past studies have discussed participant value when learning to practice mindfulness meditation (Lindsay et al., 2018) and people consistently value and implement what they have learned from contexts such as interventions and therapy. The desire to see mindfulness meditation implemented stayed consistent and showed to be of value among the current sample.

The 7-day phase of the study was an important factor incorporated to help demonstrate the efficacy and consistency of the in-person intervention. Most participants practiced 1-3 days and there was a strong sense of agreement that when participants did practice on a certain day, they valued the time spent engaging in mindfulness meditation. Many students also practiced most days of the week, which was profound for these individuals at the 30-day follow up with their PSS and MAAS scores. As discussed before, the more people practiced meditation during the 7-day phase, the more mindful they believed themselves to be and the less stress they reported. Practicing mindfulness meditation consistently is an important factor when the goal is to decrease stress and to increase mindfulness (Lemay, Hoolahan, & Buchanan, 2018; Lacaille et al., 2017; Jain et al., 2007), so the students who continued to practice throughout the week reported results consistent with the literature and ended up manifesting the benefits of practicing mindfulness meditation. Motivation to cope with stress through meditation can be also connected to students who did practice some to most of the week through scores regarding if they valued the time practiced. Acceptance and motivation generally increased as students were exposed to mindfulness meditation, which in return helped their perceptions of stress decrease and
mindfulness increase. Gaining insight and data after the in-person intervention allowed the study to examine changes in behavior, perception, and attitudes from the participants, and participants who engaged with mindfulness meditation more had changes consistent with the literature.

Limitations

One potential limitation to this study was the sample size. There were only 31 participants, and not everyone participated in the 7-day phase or the 30-day follow up. This sample size does not take into consideration the entire university the study was completed at, let alone all college students. Additionally, there could have been more diversity within the sample on the basis of age, gender, race, ethnicity, and meditation experience. Future studies should expand upon representativeness and take all demographic characteristics into consideration as mindfulness and meditation outcomes can vary on the basis of gender, age, class, and culture.

Another limitation to this study was an issue of order effect within the in-person intervention. Throughout every intervention session, the order of exercises practiced was the same, which could have had an effect on acceptability and SUDS reports throughout the intervention. There is no true way to know if stress would have decreased the same way initially with other exercises or if deep breathing was overall the most accepted exercise. Outcomes could have varied if this factor was taken into consideration, although stress stayed consistently low and no exercise was ever significantly unaccepted by students. Future studies should take into consideration the order effect to eliminate this variance.

Additionally, the in-person intervention had three different people reciting the meditation exercises across all interventions. This could affect how the practice was perceived by students such as changes in tone, pace, style, and experiencing live meditation interventions across time. It would be beneficial for future studies to control for this confound and have speakers be as
consistent with the meditation intervention as possible due to every self-report potentially being influenced by the change. It was beneficial to have multiple people guiding the meditation for external validity, but due to the small sample size internal validity could be affected by having multiple speakers. Additionally, the psychoeducation presentation was standardized for all presenters increasing internal validity.

A final limitation was having no physiological variables included in the study. Previously in the literature, results have been more profound and robust when looking at factors such as cortisol levels, heart rate in the moment, or blood pressure over time. Future studies should try to implement some form of physiological testing such as heart rate or cortisol levels as they are more objective than self-report measures. Perceived changes in stress can be questioned when it comes to reliability since perceived stress can change so quickly and vastly depending on the context and current life situations such as students participating in the 30-day follow up questionnaire during midterm week at a university. Overall, physiological measures can be argued as the most effective measure for a study concerning mindfulness meditation benefits and its effect on behavior.

Conclusion and Future Directions

The current study answered a few questions that have been examined in the literature such as if mindfulness meditation decreased stress and increased mindfulness. Results signified that if the participants practiced meditation throughout the study, then the results stayed consistent with current findings. However, questions such as if students wanted to see a course implemented into universities to learn to cope with stress through mindfulness meditation, acceptability to certain meditation practices, and changes in motivation to practice meditation after experiencing the intervention are less understood. It will always be relevant and important
to reassess the efficacy of mindfulness and meditation with the practice being relevant in professional interventions and/or therapy settings. Future investigations should consider continuing to assess their population on the basis of changes with mindfulness and stress.

Furthermore, it would also be important to expand upon the question if students would like to see courses implemented into universities. The current study only scratched the surface of this implication and it showed to have favorable attitudes. Future questions could consider if students would want to take the course themselves or if they would take the specific course over other general education/elective courses if the opportunity arose. There are several directions to take this information that could lead to significant implications about stress in universities, acceptability to different coping mechanisms, and attitudes about self-awareness and/or self-care methods.

Along with measuring decreases in stress, future studies should use physiological measures to understand changes within the body and objective behavior instead of using solely self-report measures. There are several studies within the literature that examine mindfulness meditation through methods such as cortisol levels and heart rate. A consistent, valid, and reliable method for testing a general hypothesis with stress and meditation would be a robust asset to the current study and for future implications.

A final suggestion in future investigations would be to have a greater representation of the population being examined on the basis of race, gender, age, class, ethnicity, and culture. The current methodology would be far more profound if there were more people investigated through the in-person intervention. Results could lead to different outcomes that either uphold or refute current literature as the current study did not reach significance on the basis of the PSS and MAAS scale, but was approaching statistical significance for the MAAS. Understanding if
mindfulness meditation and its reputation move with time is an important factor to be understood, especially with different cultures and gender/race identities. The current review upheld many different questions such as what students find to be an acceptable approach, decreases in stress during the moment, and more practice leading to significant results. However, the methodology should be continued with different sociodemographic information to account for potential differences in result outcomes.
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Appendix A: Informed Consent Form and Screening Questionnaire for Participation

Mindfulness-Based Meditation and Its Effects on College Students

Informed Consent Form

Project Title: Mindfulness-Based Meditation and Its Effects on College Students
Principal Investigator: Jordan Sieja, undergraduate student
Faculty Advisor: Ellen I. Koch, Ph.D., Professor of Psychology

Invitation to participate in research: You are invited to participate in a research study. In order to participate, you must be an undergraduate student at Eastern Michigan University 18 years of age or older. Participation in this research is voluntary. Please ask any questions you have about participation in this study.

Important information about this study:
• The purpose of the study is to understand the effects mindfulness and meditation have on one's perceived stress, mindfulness, and acceptability to mindfulness.
• Participation in this study involves a 65-minute total in-person experience.
• There will also be daily messages sent to participants for 7 days following the study.
• A 30-day follow up survey will be sent out to participants to complete.
• Everyone who completes the study will be automatically eligible to win a $50.00 Amazon gift card.
• This study is on the SONA system for in-person credit.
• Risks of this study include a potential loss of confidentiality.
• The investigator will protect your confidentiality by not collecting identifiable information in the questionnaires other than your phone number.
• Participation in this research is voluntary. You do not have to participate, and if you decide to participate you can stop at any time.

What is this study about? The purpose of the study is to understand the effects mindfulness and meditation have on one's perceived stress, mindfulness, and acceptability to mindfulness over time.

What will happen if I participate in this study?
• Participation in this study involves Completing a screening questionnaire prior to the in-person meeting to participate in the study.
• Taking pre-, post-, daily, and 30-day follow up intervention questionnaires throughout the study pertaining to the questions the researcher is observing.
• Engaging in a short presentation on understanding issues of stress.
• After the presentation, participants will engage in mindfulness meditation practice for 30 minutes.
• Participants will be informed of a daily follow up survey for 7 days after the study. This information will be sent through text messages.
• Overall experience of this study is 65 minutes in-person, approximately two minutes per day for the survey sent daily for 7 days, and about 10 minutes completion time for the 30-day follow up survey. The initial screening questionnaire should take about 7 minutes to complete.

What types of data will be collected? We will collect data about participants perceived stress, perceived mindfulness, and acceptability to mindfulness.

What are the expected risks for participation? The primary risk of participation in this study is a potential loss of confidentiality. Your information will be processed by an automated system (e.g., a computer program) to collect data.

Are there any benefits to participating? You will not directly benefit from participating in this research. Benefits to society include understanding undergraduate students' reactions to mindfulness meditation.

How will my information be kept confidential? We plan to publish the results of this study, present them at the undergraduate symposium, and present them at national or international conferences. We will not publish or present any information that can identify you.

We will keep your information confidential by not collecting any identifiable information that will be published in the online questionnaires. We will be using your phone number as your identifiable code to connect your data throughout the study. Once the data are collected, a participant code will be the only identifying information and your phone number will be removed from your
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data. Your information will be stored in a password-protected file on a password-protected computer. We will store your information for at least three years after this project ends, but we may store your information indefinitely.

We will make every effort to keep your information confidential, however, we cannot guarantee confidentiality. The principal investigator and the research team will have access to the information you provide for research purposes only. Other groups may have access to your research information for quality control or safety purposes. These groups include the University Human Subjects Review Committee, the Office of Research Development, the sponsor of the research, or federal and state agencies that oversee the review of research, including the Office for Human Research Protections and the Food and Drug Administration. The University Human Subjects Review Committee reviews research for the safety and protection of people who participate in research studies.

The investigators will ask you and the other people in the group to not use or say any identifiable information during the presentation and intervention. The investigators will also ask you not to tell anyone outside of the group about anything that was said during the group session. However, we cannot guarantee that everyone will keep the discussions private.

Storing study information for future use: We will store your information to study in the future. Your information will be labeled with a code and not your phone number. Your information will be stored in a password-protected or locked file and will be stored indefinitely.

We may share your information with other researchers without asking for your permission, but the shared information will never contain information that could identify you. We will send your de-identified information by email and only upon request.

What are the alternatives to participation? The alternative is not to participate.

Are there any costs to participation? Participation will not cost you anything.

Will I be paid for participation? You will be automatically eligible to win a $50.00 Amazon gift card if you complete the study. This will be done by having every participant put their name on a piece of paper, put it into a jar, and randomly selecting one name at the end of the in-person session. We will personally contact the winners and email them the gift card. You may also ask your professor(s) if they will offer you credit to participate in this study. However, we cannot guarantee that this will be granted to you. The professor has full rights to make this decision. You may also receive research credit through the SONA system if you sign up for the study through the SONA portal.

Study contact information: If you have any questions about the research, you can contact the Principal Investigator, Jordan Sieja, at jsieja@emich.edu or by phone at [517-294-0814]. You can also contact Jordan Sieja’s adviser, Dr. Ellen I. Koch, at ellenkoch@emich.edu or by phone at [734-487-0189]. For questions about your rights as a research subject, contact the Eastern Michigan University Human Subjects Review Committee at human.subjects@emich.edu or by phone at 734-487-3090.

Voluntary participation: Participation in this research study is your choice. You may refuse to participate at any time, even after signing this form, without repercussion. You may choose to leave the study at any time without repercussion. If you leave the study, the information you provided will be kept confidential. You may request, in writing, that your identifiable information be destroyed. However, we cannot destroy any information that has already been published.

Statement of Consent: I have read this form. I have had an opportunity to ask questions and am satisfied with the answers I received. I give my consent to participate in this research study.

Agreement to Participate
If you meet the eligibility criteria below and would like to participate in this study, click the button below to begin the survey. Remember, your participation is completely voluntary, and you're free to withdraw at any time.

- I am 18 years of age or older
- I am an undergraduate student at Eastern Michigan University

Approved by the Eastern Michigan University Human Subjects Review Committee
UHSRC Protocol Number: UHSRC-FY18-19-54
Study Approval Dates: 9/28/18 – 9/27/19

I consent to participate in this study and meet all eligibility criteria (1)
I do not consent to participate in this study (2)

Thank you again for showing interest in this study. This survey is a screening process to measure your experience and understanding of mindfulness and meditation. There may also be questions regarding demographics. Thank you once again for
showing interest in this study and if you have any questions regarding the screening process of study, please contact Jordan Sieja at jsieja@emich.edu.

Do you practice any form of meditation on a regular basis?

- **Yes** (1)
- **No** (2)

Have you received any significant/consistent training in meditation? (Doing something once or an activity that did not significantly affect you does not count).

- An educational class (Please specify an average amount of hours practiced) (1)
- A meditation retreat (Please specify an average amount of hours practiced) (2)
- Practice through therapy (Please specify an average amount of hours practiced) (3)
- Yoga (Please specify an average amount of hours practiced) (4)
- Other (Please specify an average amount of hours practiced and a brief description of what you practice) (5)
- I have not received training in meditation (6)

Do you currently practice the training you have described above?

- **Yes** (1)
- **No** (2)
- **Sometimes** (4)
- **Not applicable** (5)
Please provide your mobile phone number. This is so we can contact you for the daily survey portion of the study. This information will not be shared or used for any purposes outside of this study.

☐ Please put phone number here: _______________________

DEMOGRAPHICS What is your age?

☐ 18-20 (1)

☐ 21-23 (2)

☐ 23-25 (3)

☐ 25-27 (4)

☐ Above 27 (5)

What would best describe you?

☐ African American (1)

☐ Asian (2)

☐ Native American (3)

☐ Hispanic or Latino (4)

☐ White (5)

☐ Other (6) _______________________

Please specify your ethnicity.

☐ White (1)

☐ Hispanic or Latino (2)
To which ethnic identity do you most identify?

○ American Indian or Alaska Native (3)

○ Black or African American (4)

○ Asian (5)

○ Native Hawaiian or Pacific Islander (6)

○ Other (7) ____________________________

To which gender identity do you most identify?

○ Male (1)

○ Female (2)

○ Gender variant/non-conforming (3)

○ Other (4) ____________________________

○ Prefer not to answer (5)

What is your current employment status?

○ Full-time employment (1)

○ Part-time employment (2)

○ Unemployed (3)

What is your current student enrollment status?

○ Full-time (1)

○ Part-time (2)
Are you currently in any treatment, therapy or counseling for psychological help?

- Yes (1)
- No (2)
- Prefer not to answer (3)

Thank you for your interest in wanting to participate in this study. If you wish to proceed, please indicate a date and time in accordance with the options below during the week of January 21st. Please sign up for a time slot and date that works best for you. All dates and times will be held at Halle Library. If you do sign up for a date, please show up approximately 15 minutes early to assure you have time to get settled in for the study. We would also like you to have your phone handy as you may need to use it during the study. If you must cancel or can no longer participate/ do not want to participate, please email jsieja@emich.edu to assure that your slot is removed, and our participation rate is as close to expected as possible. Once again, thank you for your interest in this study and we will see you in January. If you have any questions, please contact the email given above.
Appendix B: Post-Intervention Questionnaire

Post-intervention questionnaire

Please provide your mobile phone number. This information will not be shared or used for any purposes outside of this study.

- Phone number: ___________________

The intervention has been helpful by showing the importance of coping with stress effectively, specifically through mindfulness meditation.

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)

I have a desire to implement mindfulness meditation techniques into my life to help cope with stress after engaging with the intervention.

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
I am motivated to cope with my stress in positive ways after experiencing this session.

Meditation seems like a reasonable coping strategy to use in everyday life.
I value/valued learning effective ways to cope with stress in my day-to-day life.

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)

I would want to see courses about learning the effects of stress and ways to cope with stress through strategies such as mindfulness meditation implemented into universities to take for credit towards graduation.

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)
Appendix C: 30-Day Follow up Questionnaire

Please provide your mobile phone number. This Information will not be shared or used for any purposes outside of this study.

☐ Phone number: (1) ___________________ _

Instructions: The next questions are collection of statements about your everyday experience. Please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

I could be experiencing some emotion and not be conscious of it until some time later.

☐ 1 Almost always (1)

☐ 2 Very frequently (2)

☐ 3 Somewhat frequently (3)

☐ 4 Somewhat infrequently (4)

☐ 5 Very infrequently (5)

☐ 6 Almost never (6)

I break or spill things because of carelessness, not paying attention, or thinking of something else.

☐ 1 Almost always (1)

☐ 2 Very frequently (2)

☐ 3 Somewhat frequently (3)

☐ 4 Somewhat infrequently (4)

☐ 5 Very infrequently (5)

☐ 6 Almost never (6)
I find it difficult to stay focused on what's happening in the present.

○ 1 Almost always (1)

○ 2 Very frequently (2)

○ 3 Somewhat frequently (3)

○ 4 Somewhat infrequently (4)

○ 5 Very infrequently (5)

○ 6 Almost never (6)

I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.

○ 1 Almost always (1)

○ 2 Very frequently (2)

○ 3 Somewhat frequently (3)

○ 4 Somewhat infrequently (4)

○ 5 Very infrequently (5)

○ 6 Almost never (6)
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I tend not to notice feelings of physical tension or discomfort until they really grab my attention.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)

I forget a person's name almost as soon as I've been told it for the first time.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)
It seems I am "running on automatic," without much awareness of what I'm doing.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)

I rush through activities without being really attentive to them.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)

I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)

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I do jobs or tasks automatically, without being aware of what I'm doing.

- 5 Very infrequently (5)
- 6 Almost never (6)

I find myself listening to someone with one ear, doing something else at the same time.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)

I drive places on 'automatic pilot' and then wonder why I went there.

- 1 Almost always (1)
I find myself preoccupied with the future or the past.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)

I find myself doing things without paying attention.

- 1 Almost always (1)
- 2 Very frequently (2)
- 3 Somewhat frequently (3)
- 4 Somewhat infrequently (4)
- 5 Very infrequently (5)
- 6 Almost never (6)
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I snack without being aware that I'm eating.

Almost never (6)

Almost always (1)

Very frequently (2)

Somewhat frequently (3)

Somewhat infrequently (4)

Very infrequently (5)

Almost never (6)

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by choosing how often you felt or thought a certain way.

In the last month, how often have you been upset because of something that happened unexpectedly?

Never (1)

Almost never (2)

Sometimes (3)

Fairly often (4)

Very often (5)

In the last month, how often have you felt that you were unable to control the important things in your life?

Never (1)

Almost never (2)

Sometimes (3)
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In the last month, how often have you felt nervous and "stressed"?

- Never (1)
- Almost never (2)
- Sometimes (3)
- Fairly often (4)
- Very often (5)

In the last month, how often have you felt confident about your ability to handle your personal problems?

- Never (1)
- Almost never (2)
- Sometimes (3)
- Fairly often (4)
- Very often (5)

In the last month, how often have you felt that things were going your way?

- Never (1)
- Almost never (2)
- Sometimes (3)
In the last month, how often have you found that you could not cope with all the things that you had to do?

- Never (1)
- Almost never (2)
- Sometimes (3)
- Fairly often (4)
- Very often (5)

In the last month, how often have you been able to control irritations in your life?

- Never (1)
- Almost never (2)
- Sometimes (3)
- Fairly often (4)
- Very often (5)

In the last month, how often have you felt that you were on top of things?

- Never (1)
- Almost never (2)
- Sometimes (3)
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○ Fairly often (4)

○ Very often (5)

In the last month, how often have you been angered because of things that were outside of your control?

○ Never (1)

○ Almost never (2)

○ Sometimes (3)

○ Fairly often (4)

○ Very often (5)

In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

○ Never (1)

○ Almost never (2)

○ Sometimes (3)

○ Fairly often (4)

○ Very often (5)

Implementing what I have learned from the intervention has been helpful in decreasing my stress levels.

○ Strongly disagree (8)

○ Disagree (9)

○ Somewhat disagree (10)
I have applied what I have learned from the intervention into my day-to-day life.

- Strongly disagree (8)
- Disagree (9)
- Somewhat disagree (10)
- Neither agree nor disagree (11)
- Somewhat agree (12)
- Agree (13)
- Strongly agree (14)

I have used the exercises or techniques learned from the intervention in my day-to-day life.

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
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○ Agree (6)

○ Strongly agree (7)

I have been practicing mindfulness meditation...

○ Less than one time per week (1)

○ 1-2 times per week (2)

○ 2-4 times per week (3)

○ More than 4 times per week (4)

The average duration of time I spend practicing mindfulness meditation per session is...

○ Less than 5 minutes (1)

○ 5-10 minutes (2)

○ 10-15 minutes (3)

○ 15-20 minutes (4)

○ More than 20 minutes (5)

○ Not applicable (6)

I have a desire to implement mindfulness meditation techniques into my life to help cope with stress after engaging with the intervention.

○ Strongly disagree (1)

○ Disagree (2)

○ Somewhat disagree (3)

○ Neither agree nor disagree (4)
I have become more accepting of this practice and of its benefits after experiencing the intervention.

I was motivated to cope with stress in positive ways after experiencing the intervention.
Since applying what I have learned from the intervention, I am handling my stress in more effective and healthy ways (if you have not applied information from the intervention into your life, please select 'not applicable').

I would want to see courses about learning the effects of stress and ways to cope with stress through strategies such as mindfulness meditation implemented into universities to take for credit towards graduation.
Appendix D: Acceptability Questionnaire

Acceptability piece to intervention

Please provide your mobile phone number. This information will not be shared or used for any purposes outside of this study.

Phone number: ___________________ 

The following question is about your current perceived levels of stress. Please answer the question in regard to how you actually feel and not what you think you should be feeling.

In this moment I feel...

- 0- No distress; totally relaxed.
- 1- Alert and awake; concentrating well.
- 2- Minimal distress.
- 3- Mild distress; no interference with functioning.
- 4- Mild-to-moderate distress.
- 5- Moderate distress; uncomfortable, but can continue to function.
- 6- Moderate-to-strong distress.
- 7- Quite distressed; interfering with functioning. Physiological signs may be present.
- 8- Very distressed; can't concentrate. Physiological signs present
- 9- Extremely distressed.
- 10- Highest distress that you have ever felt.

I enjoyed the exercise that was just practiced.

- Strongly disagree
- Disagree
- Somewhat disagree
Neither agree nor disagree

Somewhat agree

Agree

Strongly agree
Appendix E: Daily Survey
Daily Survey Post-Intervention

Please provide your mobile phone number. This information will not be shared or used for any purposes outside of this study.

- Phone number: ____________________________

Did you practice mindfulness meditation today (since the previous survey)?

- Yes
- No

After practicing mindfulness meditation, my stress levels decreased.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree

I felt more mindful after practicing mindfulness meditation.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree
MEDITATION AND STRESS

I practiced mindfulness meditation for....

- Less than 5 minutes
- 5-10 minutes
- 10-15 minutes
- 15-20 minutes
- More than 20 minutes

I valued the time I spent today practicing mindfulness meditation.

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree

Today I have felt...

- 0- No distress; totally relaxed.
- 1- Alert and awake; concentrating well.
- 2- Minimal distress.
- 3- Mild distress; no interference with functioning.
- 4- Mild-to-moderate distress.
- 5- Moderate distress; uncomfortable, but can continue to function.
- 6- Moderate-to-strong distress.
7 - Quite distressed; interfering with functioning. Physiological signs may be present.

8 - Very distressed; can't concentrate. Physiological signs present

9 - Extremely distressed.

10 - Highest distress that you have ever felt.
Appendix F: Institutional Review Board Letter of Approval

Sep 28, 2018 9:44 AM EDT

Jordan Sieja

Eastern Michigan University, Psychology

Re: Expedited Review - Initial - UHSRC-FY18-19-54 Mindfulness-Based Meditation and Its Effects on College Students

Dear Jordan Sieja:

The Eastern Michigan University Human Subjects Review Committee has rendered the decision below for Mindfulness-Based Meditation and Its Effects on College Students. You are approved to conduct your research.

Decision: Approved

Selected Category:

Findings: You must use stamped copies of your recruitment and consent forms.

To access your stamped documents, follow these steps: 1. Open up the Dashboard; 2. Scroll down to the Approved Studies box; 3. Click on your study ID link; 4. Click on "Attachments" in the bottom box next to "Key Contacts"; 5. Click on the three dots next to the attachment filename; 6. Select Download.

Renewals: This approval is valid for one year and expires on September 27, 2019. If you plan to continue your study beyond September 27, 2019, you must submit a continuing review application in Cayuse IRB at least 14 days prior to September 27, 2019 so that your approval does not lapse.

Modifications: All changes to this study must be approved prior to implementation. If you plan to make any changes, submit a modification request application in Cayuse IRB for review and approval. You may not implement your changes until you receive a modification approval letter.
Problems: All deviations from the approved protocol, unanticipated problems, adverse events, subject complaints, or other problems that may affect risk to humansubjects or alter their willingness to participate must be reported to the UHSRC. Complete the incident report application in Cayuse IRB.

Please contact humansubjects@emich.edu with any questions or concerns.

Sincerely,

Eastern Michigan University Human Subjects Review Committee