

EVALUATING MINDFULNESS IN THE CLASSROOM:  
DECREASING NURSING STUDENT PERCEIVED STRESS

by

Meagan Arthur

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Dr. Christi Callahan, Dr. Wendy Downey, Dr. Francis Dane

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Dr. Christi Callahan, chair

4-29-2022

Date



Dr. Wendy Downey

4-29-2022

Date



Dr. Francis Dane

04-29-2022

Date

**Abstract**

In a time in the world where personal stress is at a peak, there is a heavier emphasis in society on reducing stress through various means such as meditation, guided imagery, journaling, and mindfulness. Given the increased stress that students are experiencing, whether related to the intense nature of an undergraduate nursing program, the COVID-19 pandemic, or a combination of both, nursing students in particular may benefit from implementation of mindfulness techniques in the classroom.

For this study, participants were randomly assigned to either an experimental group that listened to a mindfulness intervention recording or a control group that listened to a guided breathing exercise. Prior to the start of the study, students filled out a survey that contained both the Perceived Stress Scale (PSS; Cohen et al., 1983) and the Mindful Awareness Attention Scale (MAAS; Brown & Ryan, 2003). At the conclusion of the study, students were given a post-survey that addressed the exact same PSS and MAAS questions. Post-study scores between groups were compared and there was no difference in mindfulness between the intervention and control group. There was also no evidence that mindfulness had any effect on perceived stress. However, when comparing boxplots of combined (whole class) PSS scores, PSS scores at the end of the semester appeared to be lower than the class average at the beginning of the semester. Due to the post-test design, this could not be analyzed statistically, but this is a topic for further exploration. Last, student exam grades were also analyzed to determine if the intervention group displayed higher exam averages than the control group and there were no differences noted.

*Keywords: mindfulness, stress, classroom, nursing*

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## CHAPTER 1: INTRODUCTION

### **Problem & Significance**

There is an alarming crisis in this country pertaining to increased stress (Coiro et al., 2021). The COVID-19 pandemic has affected college students in numerous ways: death of family members or friends, lost jobs or lost wages, housing or food instability, and fear for personal health and wellness due to increased risk of becoming ill. Because of the societal awareness, or maybe the experience of increased stress, introduction of various stress reduction methods in the classroom may be welcomed by students and instructors alike. However, perceived stress for nursing students is not a new concept and has only further intensified during the COVID-19 pandemic, due to personal stressors in addition to uncertainty with nursing coursework and clinicals (Michel et al., 2021).

Prior to the COVID-19 pandemic, research has shown that nursing students have a higher rate of stress than non-nursing students, due to outside factors that may influence their education, such as having dependents or working a part-time job to help pay for tuition while simultaneously attending intensive courses and clinical experiences (Bartlett et al., 2016; Black Thomas, 2021). Some nurses also choose to further their education, whether as a licensed practical nurse enrolled in a registered nursing program (Associate of Science in Nursing), or as a registered nurse enrolled in a Bachelor of Science in Nursing Program. This degree completion can occur in a multitude of ways (traditional on-campus approach for the LPN to RN experience versus online degree completion for RNs seeking to obtain their Bachelor of Science Degree). While these students may be seasoned nurses returning even decades later to the classroom, they are not immune to the stressors of nursing school, even in an online format. As Spadaro and

Hunker (2016) noted, “Nurses returning to school while working, raising families, and maintaining other roles, can experience stress, mood changes and cognition disturbance that negatively impact their academic success” (p. 163).

In addition, students in nursing school often witness distressing events and may carry a heavy emotional burden after intense clinical and patient experiences. As Rees et al. (2016) speculated, “it is highly probable that they may experience stress, fatigue and burnout before they even complete their final exams and enter into the profession as a registered nurse” (p. 2). This team of researchers, along with Rayan (2019), has drawn causal conclusions from correlational studies that suggest that activities that introduce and teach mindfulness practices not only help students with resiliency and stress management in school, but also give them skills to be resilient and manage stress in the workplace as well (Rayan, 2019; Rees et al., 2016). Mindfulness is defined as “awareness and acceptance of the present moment without judgement or reaction” (Rayan, 2019, p. 50). This is often a difficult task, regardless of age, experience, or occupation. For nursing students who are juggling multiple commitments, courses, and clinicals, this is a skill that while challenging, can have a profound impact on stress management.

Results from recent studies also hint that mindfulness interventions will have some type of positive effect on students who report being stressed or overwhelmed. Along with reduction in reported or perceived stress, researchers studying mindfulness interventions have found other positive effects on resilience, self-efficacy, self-compassion, coping, and self-knowledge (Aranega et al., 2019; Taylor et al., 2020; Vidic & Cherup, 2019). Students may be unfamiliar or uncomfortable with mindfulness, or even assume that mindfulness is equivalent to meditation, since they tend to be used interchangeably, and thus incorrectly, in society. However, recent

significant studies that have used validated stress scales show that mindfulness is an activity worth employing to reduce nursing student perceived stress (Munif et al., 2019; Song & Lindquist, 2015; Spadaro & Hunker, 2016).

Since many mindfulness studies have demonstrated statistically significant stress reduction, this is likely appealing for undergraduate nursing students. In a curriculum where students are taught to look at data, facts and used evidence-based practice in their clinical practice, “students appreciate learning the evidence behind stress management and mindfulness medication techniques” (Chase-Cantarini & Christiaens, 2019, p. 391). Providing scientific data about the benefits of using mindfulness may also increase student interest and buy-in to participating in and being engaged in mindfulness activities designed to decrease stress and improve classroom performance.

Even informal mindfulness activities may be well-received by faculty and students alike. Simply taking a short window of time before and/or after each lecture to allow for mindful meditation can give students a sense of calm and perceived reduction of stress. Chase-Cantarini and Christiaens (2019) found that incorporating a structured and guided “Mindfulness Moment” time (non-obligatory) before each lecture resulted in overwhelmingly positive feedback, both in the distributed post-survey for the intervention, as well as end of the course evaluations (where students were not prompted to comment on the intervention, as this was a general course evaluation). The educators noted that the 10 minutes allotted during each class for this activity resulted in increased student engagement and student satisfaction with the course (Chase-Cantarini & Christiaens, 2019).



**Specific Aim & Focus**

Aside from some of the formal and informal studies about the many benefits of mindfulness implementation, there appears to be a gap with what is known on a collegiate level about the benefits of mindfulness for undergraduate nursing students and the actual application of mindfulness in the classroom. Students have perhaps been introduced to mindfulness as something they “should” do, but on their own time. They may have been exposed to mindfulness in other nursing courses, but are unable to practice mindfulness consistently in other courses or domains of life. Studies have shown statistically significant results with stress reduction after mindfulness interventions, but the methods of delivery, dedicated time for the mindfulness activity, and control groups have varied widely.

Narrowing in on the most effective mindfulness intervention for nursing students will likely be challenging, as nursing students have varying clinical courses and course requirements each semester, with schedules that are not flexible. Studies have produced differing results pertaining to when and why nursing students experience stress. Salvarani et al. (2018) noted that some studies demonstrate stress levels that are unchanging, some demonstrate a peak of stress during the third year, and some demonstrate decreasing stress levels closer to graduation. Other researchers have qualitatively studied more specialized groups of nursing students, such as “after-degree” or “accelerated” baccalaureate students and their stress levels, along with the positive benefits of implementing brief mindfulness-based interventions (Marthinsen et al., 2019). Yet, regardless of the level of or when and why it is occurring, stress is a common theme in nursing school. This further indicates a need to better understand nursing school stress and provide nursing students with a better foundation for success both in the classroom and at home

and/or work. Nursing is known as a career with a high stress level, due to “the physical labor involved in patient care, the human suffering they witness, the need for on-the-spot decision making, long work hours, staffing, and interpersonal relationships” (Penprase et al. 2015, p.40). It is critical that nurse educators think about preparing nursing students to enter this rewarding but stressful workforce with tools for managing stress.

This study’s aim was to examine whether implementation of a mindfulness activity in a classroom, while utilizing a nonspecific relaxation technique as a control, demonstrates the importance of using established and well-studied mindfulness practices to measurably decrease stress and improve academic performance in nursing programs.

### **Needs Assessment**

In recent semesters, as observed by the recruiters, nursing students have demonstrated and verbalized higher levels of stress and anxiety, poor time management skills, and outside factors (i.e., jobs, family obligations) that make managing their schedules more difficult. In addition, nursing “burnout” is well documented in the past 15 years, with estimates as high as 60% of new nurses leaving the nursing profession within their first few years of practice (Penprase et al., 2015, p. 40). Therefore, given the researcher’s concerns regarding perceived lack of coping and stress reduction skills with each undergraduate cohort over recent years, the researcher wanted to determine if implementing brief mindfulness interventions in the undergraduate nursing program would be beneficial in reducing perceived stress. This study took place at a small-to-moderately sized public university in southwest Virginia. Students who took part in this study were level three (senior level) nursing students who have three clinicals courses

in the fall semester. Student participation was voluntary and the total number of participants was comprised of a student group of approximately 60 students.

This pilot study aimed to explore the following question: For undergraduate nursing students, is an abbreviated mindfulness intervention beneficial in reducing perceived stress and increasing academic classroom performance over the course of a semester?

### **Theoretical Framework**

Albert Bandura's Model of Self-Efficacy is an ideal construct when considering the implementation of an abbreviated mindfulness intervention. Self-efficacy is a vital component of a person's role as both a student nurse and a professional nurse, as they must believe that the tasks set before them are attainable. However, these tasks and ability to master them are not innate; students must be taught and given the tools to be successful. As Bandura (1997) noted, "perceived self-efficacy is not a measure of the skills one has but a belief about what one can do under different sets of conditions with whatever skills one possesses" (p. 37). Students and even practicing nurses may not simply have the ability to decrease their own stress levels independently, but with repetition, education, and practice, students may find ways to decrease stress and increase mindfulness (which then also contributes to a stronger sense of self-efficacy).

Mindfulness training is not a one-time occurrence but rather a skill that must be constantly reinforced in the early learning stages. As previously mentioned, as a whole, society is bombarded with terms and phrases such as "mindfulness," "engagement," and "holistic," but simply being familiar with these terms or even a baseline understanding of their meaning does not make students experts on how to best utilize them. With implementation of brief, weekly mindfulness interventions for the entire semester, participants will ideally continue mindfulness

practices as a routine exercise, long after the course has finished. This weekly practice over the course of the semester will hopefully become a habit that can be utilized in professional nursing practice.

Also, by providing a mindfulness intervention for students who, by progression through each level of their nursing program demonstrate that they are motivated to learn and succeed, participants will ideally be able to both learn and apply the mindfulness concepts to both improve their engagement and educational satisfaction in addition to decreased stress.

Bandura's emphasis about self-efficacy and the importance of being able to utilize skills within different sets of circumstances is the most accurate reflection of what the nursing profession demands. Regardless of the role that a nurse is working in on any specific day, circumstances are changing constantly. Although, for the purposes of this theory, circumstances are patients, changes in patient health, emergencies that may arise, changes in plans of care, and much more. It is critical that nursing students learn how to be present in the moment, how to focus on each individual patient or situation that demands their attention, and how to maintain a centered focus when distractions arise. If educators are proactive and introduce these skills and the practice of mindfulness in an undergraduate program, students will be better equipped to deal with the stressors of the nursing profession before they actually encounter them, enhancing self-efficacy.

### **Research Question**

This pilot study aimed to explore the following question: For undergraduate nursing students, is an abbreviated mindfulness intervention beneficial in reducing perceived stress and increasing academic classroom performance over the course of a semester?

### **Summary**

After several semesters of witnessing student stressors increase, along with student inability to manage stress effectively, this researcher desired to implement strategies within an already rigorous and time-consuming undergraduate nursing curriculum. As discussions continued among the study team, a brief mindfulness intervention was deemed to be the most logical, and likely useful, strategy to provide students with tools for success in both the classroom and healthcare environment. As demonstrated in the literature review, mindfulness-based interventions are not standardized and the term “brief” is not well defined, which means that even within the literature review, there are varied results.

## **CHAPTER 2: INTEGRATED REVIEW OF THE LITERATURE**

### **Search Strategies & Results**

Multiple search engines were utilized, including PubMed, MEDLINE, PsycINFO, and CINAHL (Cumulative Index to Nursing and Allied Health Literature). Key words used in the search included students, college, nursing, mindfulness, anxiety, stress, and classroom. Articles from 2011 through 2022 were considered. Studies from several countries were included in the review as they took place in academic settings in college classrooms. The goal of the literature search was to identify any studies, trials, or programs that have examined the relationship between mindfulness interventions, during class time or outside of class, and the benefit on college students in managing their personal stress.

A total of 13 studies were selected and included for the final analysis of the literature review. The 13 studies included both randomized and nonrandomized controlled trials, pilot studies, cohort studies, and quasi-experimental studies. There have been many qualitative studies that have been performed and give weight to the argument for implementing mindfulness in the classroom, but only one was included in the formal literature review for this discussion.

### **General Themes with Mindfulness in the Classroom**

There is certainly a trend with mindfulness in the classroom, especially at the collegiate level, given the changing attitudes and expectations in current society regarding stress management. The majority of the many different studies that have been done, and with a variety of methods, have shown statistically significant results with mindfulness interventions and stress reduction. This is encouraging and reinforces the idea that this is a topic worth continuing to explore to support students to be successful in their academic career. There are also many gaps

within this body of research that should be investigated further as well. While many studies support both the continued exploration of mindfulness in the classroom and/or the areas for continued research, there are several studies that bear special mention.

### **Lack of Control Groups**

One area for continued research is that most studies that aim to study a mindfulness intervention are not always utilizing a control group that rules out a placebo effect. As previously noted, many terms similar to mindfulness are used interchangeably, and with these concepts that are currently trending in society, students may report lower perceived stress because they feel good about addressing their issues; but stress scales demonstrate that stress is, in fact, not decreased. Strait et al. (2020) performed a randomized, controlled experiment that demonstrated decreased stress in the intervention group (who received general information on mindfulness and did self-study mindfulness on their own) compared to a control group (study skill review group). However, the intervention and control groups were vastly different; self-study mindfulness does not compare to a study skills group. In addition, because the mindfulness intervention was more of a self-study approach, it is difficult to determine if each participant received the same content and had the same experience. Providing an in-class intervention would help correct for this variable, but many professors may find that time is a significant barrier that they cannot overcome. When lectures are set for a designated amount of time, it may be incredibly difficult to even allocate 10-15 minutes per class to performing an intervention.

Miller et al. (2017) had some conflicting results in their pilot study on brief mindfulness interventions. Their participants were all third year psychology students and perhaps their greater understanding of mindfulness and its implications may not translate to other types of

undergraduate students in healthcare fields (such as nursing). The researchers utilized a brief mindfulness intervention in the classroom (less than 5 minutes) and an abbreviated Mindfulness Attention Awareness Scale (MAAS) but did not receive statistically significant results with stress reduction (Miller et al., 2017). In fact, students reported higher levels of stress as the semester progressed, which would be expected, as coursework and exams become higher stakes as the semester progresses, especially if students are struggling. This brings to light two important avenues for further consideration: a control group to compare stress levels without an intervention, and use of the full-scale MAAS with both an experimental and control group. The authors did note that since students are naturally more stressed toward the end of the semester with final exams looming, their recommendations for repeat research would be to include a control group and the use of “instruments with clear psychometric support to finely focus on outcomes” (Miller et al., 2017, p. 1052).

Aranega et al. (2019) performed a study with a group of 64 business administration students at a university in Spain and demonstrated a 15% reduction in perceived stress for participants after a mindfulness-based intervention. Aranega et al. (2019) instituted a mindfulness program where an instructor taught and led various techniques on a scheduled basis such as mindful breathing, meditation exercises, and relaxation techniques that the students also replicated at home (p. 442). While many mindfulness studies have been performed with undergraduate students in health and service-based programs, it is important that researchers can obtain encouraging results with students who may be mindfulness “naïve.” Students in health and service-based disciplines are likely to have more exposure, education, and awareness of the mind-body connection and physiologic effects of increased stress on the body, therefore resulting



in greater personal investment in utilizing mindfulness techniques. While the study did not utilize a control group, the results reinforce that mindfulness can be applied to any student and any discipline, regardless of prior experience or exposure to stress reduction techniques.

Penprase et al. (2015) attempted to study the implementation of a mindfulness-based stress reduction program, first with an accelerated baccalaureate nursing program cohort, and then again with a group of experienced nurses within a hospital setting. The goal was to pre-pilot the program with the nursing students and then repeat, with modifications as needed, for the hospital-based program. Interestingly, none of the accelerated nursing students actually completed the 8-week program, so no quantitative data could be compiled. This is not necessarily surprising, as this scenario reflects the already high demands of a rigorous nursing program and adding an additional responsibility onto an already stressed student (i.e., increased time required for the mindfulness homework and weekly 2-hour trainings required; Penprase et al., 2015). The research team identified barriers for completion of the MBSR program as time required, rigorous coursework, and clinicals that didn't allow for all students to attend the same session. With these realizations, the team was able to make modifications for the hospital-based MBSR program and decrease the face-to-face time commitment to 1 hour on alternating weeks, along with "simplification" of the mindfulness process (Penprase et al., 2015, p. 43). Of the 14 nurses who started the program, four completed the entire 8-week course. This study is certainly worth replicating in a hospital setting, but time commitments must be taken into consideration, along with realistic expectations for what staff can or will likely commit to during their off-shift time when they are already exhausted and perhaps trying to prepare for another shift the next day

(or night). Results were all anecdotal and if this study is replicated, it would be worth strengthening with control and experimental groups to assess true effect on stress reduction.

### **Instructor Knowledge and Comfort with Implementing Mindfulness**

Chase-Cantarini and Christiaens (2019) encouraged future researchers to utilize the many materials and resources available for “mindfulness moments” and that even allowing for a few brief moments of quiet meditative time at the start of lecture can have positive effects on students’ engagement and focus in the classroom, even though this is vastly different than mindfulness training (p. 391). However, while utilizing meditation activities may demonstrate increased engagement for students, it is important to control for students’ perception that their stress is reduced while also providing education and training for continued mindfulness in the future. Having students do a mindfulness project during their own time may likely lead to lower compliance or fewer students who actually complete the study, as time management is a major stressor for undergraduate nursing students. Also, depending on the type of mindfulness intervention activity and the amount of time needed to complete each session, the student may find that the activity time requirement actually induces more stress rather than decreasing it.

### **Promising Results**

Taylor et al. (2020) had some intriguing outcomes with their study with a group of undergraduate psychology majors. In their study, they followed a group of students who completed Mindfulness Based Cognitive Therapy strategies following a book/program; the program was self-guided and students completed pre- and post-survey questions assessing “perceived stress,” “mental health,” “general levels of mindfulness,” “self-compassion,” and “beliefs about coping ability” (Taylor et al., 2020, p. 3). While this type of study explored many

different venues pertaining to mindfulness, some interesting themes occurred. Much like Miller et al. (2017), the researchers found that perceived stress indeed increased over the semester, which is likely a natural and expected occurrence. However, while students did not demonstrate any statistically significant changes in regard to mindfulness, they had significant improvements in “overall self-compassion, common humanity, feelings of isolation and coping self-efficacy” (Taylor et al., 2020, p. 5). Lending to Bandura’s theory of self-efficacy, if students believe that they possess and can utilize tactics to reduce stress, they are likely to continue working towards that goal. While these findings do not support that mindfulness decreased stress in this specific study, students still demonstrated other desirable benefits that may or may not directly correlate with the mindfulness interventions. These benefits could potentially be a Hawthorne effect, given that mindfulness did not increase and the basis of the intervention was a mindfulness-based cognitive therapy.

Vidic and Cherup (2019) had very encouraging outcomes with their study. The researchers conducted a study where the intervention group received mindfulness-based relaxation training for 90 minutes, twice weekly, for an entire semester, whereas the control group was comprised of students who were engaged in physical activities in physical education courses (pp. 132-133). Interestingly, mindfulness was not studied as an independent measure, but rather the focus of the study was on the effects of the mindfulness-based relaxation on stress, resilience, general self-efficacy, and perfectionism (Vidic & Cherup, 2019). It should be noted that students in this study were not randomly assigned to the treatment and control groups. In addition, this is an interesting concept/control group, because, while not ruling out a placebo effect entirely, the control group would still likely be experiencing some sort of positive effect

from the physical activity (i.e., increased endorphins, friendship, and bonding) that may alleviate or decrease stress. Nonetheless, the experimental group still showed significant results with the mindfulness-based relaxation intervention decreasing their stress levels. The mindfulness-based relaxation intervention occurred as a one-credit course so students were receiving this intervention with an instructor present and guiding them, rather than relying on performing mindfulness activities individually outside of class. This may be a significant reason that the study demonstrated positive results with stress reduction, as students were able to hone in on self-efficacy skills as well (Vidic & Cherup, 2019, p. 139). The researchers noted that due to the statistically significant increase in self-efficacy in their study, measured with the General Self-Efficacy scale, “these findings offer encouraging results by adding to the sparse and inconclusive research on the relationship between mindfulness and self-efficacy” as self-efficacy is often a “mediator to a number of positive outcomes with college students” (Vidic & Cherup, 2019, p. 139). Again, this lends to the reinforcement of Bandura’s Model of Self-Efficacy and the likelihood that when students are taught how to be mindful, through both education and reinforcement, that they will have improved self-efficacy in their efforts of personal stress reduction.

A team of researchers in Turkey led a quasi-experimental/nonrandomized study that validated the concept of instructor-led mindfulness interventions. While not a brief intervention, as sessions were weekly and lasted 2 hours each, the interventions were led by a trained researcher in the fields of cognitive and behavior therapy (Yuksel & Yilmaz, 2020). The authors utilized both the MAAS and Depression Anxiety Stress Scale (DASS) to determine what impact, if any, the mindfulness intervention had on these topics. Several articles and other studies have

discussed assessing both, as the terms anxiety and stress are often used interchangeably, which is perplexing. Stress is a response to a situation that may change at any time, while anxiety is a mental health disorder that cannot necessarily be impacted in the same way. This was reflected in the findings, as there were no significant changes in the pre-/post-surveys for either the experimental or control group pertaining to the DASS and measurements for anxiety, but there were significant improvements in stress reduction for the experimental group, as well as statistically significant increases in mindfulness (Yuksel & Yilmaz, 2020). This highlights the importance of further exploring instructor-led mindfulness interventions, but since several studies have already done so with time-consuming interventions, further research should be done to examine classroom-based, brief mindfulness interventions.

Much like Vidic and Cherup (2019) and Yuksel and Yilmaz (2020), a team in Italy had very similar and encouraging results with stress reduction after a mindfulness-based intervention in the classroom. Cheli et al. (2020) implemented a nonrandomized controlled study with an intervention group that received “five regular 3-hr sessions and one all-day class lasting 4 and a half hours that were partially based on the mindfulness-stress reduction tradition” along “with a few components of mindfulness-based cognitive therapy and compassion focused therapy” (p. 95). They found that the intervention group, while utilizing the MAAS and Copenhagen Burnout Inventory, showed statistically significant reduction in “perceived burnout” along with an increase in mindfulness (p. 98). The researchers noted that their research demonstrates the need for integration within nursing curriculum, as their follow-up semester later with students who participated in the study still demonstrated positive effects from the training received (Cheli & Bartolo, 2020).

Song and Lindquist (2015) evaluated a mindfulness-based stress reduction program with Korean nursing students and found that this implementation in the nursing curriculum produced statistically significant reductions in reported anxiety, depression, and stress along with a “greater increase in mindfulness” (p. 87) for those in the intervention group. Study participants were divided into the experimental group (which received 8 weeks of mindfulness-based stress reduction training, 2 hours per session, led by a qualified and experienced MBSR instructor) or a “wait-list” control group (which received no intervention and participants were reminded to not interact with or ask questions of the experimental group participants). Demographics were comparable among the groups and there were no significant differences between groups with baseline/pre-intervention survey results. The researchers used both the abbreviated DASS-21 and an adapted Korean MAAS. The participants were not blinded to the researchers and participants were also aware of what group they were assigned to, which does lead to questionable bias by the nursing students who were in the experimental group. Repetition of this study would be useful while incorporating a larger sample size (there were only 21 participants in the MBSR group and 23 participants in the wait-list group) as well as additional considerations for the length of the intervention (brief, as some studies have shown to be effective in reducing stress versus extensive and at least 1-2 hours, as demonstrated in this study) (Song & Lindquist, 2015).

### **Other Types of Mindfulness**

In reviewing current and relevant literature about mindfulness, data on both eastern and western forms is available. While the studies addressed thus far in this review have been eastern-based mindfulness, the mindfulness intervention has not been rooted in specific religious or cultural founding and has been more generic in its description. However, there are some specific

studies that focus on mindfulness rooted in religion, or mindfulness that is of a different platform.

One such study addressing mindfulness founded on religion was done with nursing students in 2019 by Munif et al. The researchers used a pre-post quasi-experimental design, along with a control group, to determine if Islamic spiritual mindfulness would reduce stress with a cohort of 36 nursing students who were completing a thesis project (Munif et al., 2019). The researchers noted that previous forms of Christianity-based mindfulness have been studied, but that there are limited studies pertaining to mindfulness within one's preferred religion or spiritual preference. In this instance, nursing students in a predominantly Muslim country are more likely to adopt the mindset that "Islamic spiritual mindfulness is a supportive educative action to build self-awareness that the problem an individual is experiencing today is the scenario of Allah" (Munif et al., 2019, pp. 70-71), which would then shift the focus from a self-driven mindfulness approach to one that is directed from a higher being. This is most certainly different than the mindfulness that is not even based on religion at all, because students may assign spiritual meaning to challenges and stressors that are present in their life.

In this study, the nursing students were similar in makeup to the average, traditional nursing student in America (approximately early 20s, majority female). The participants filled out the DASS-42 both pre- and post-intervention. The control group utilized no activity at all, while the intervention group received 5 days of sessions, just 20 minutes per session, consisting of seven different components of Islamic mindfulness (Munif et al., 2019). At the conclusion of the study, the intervention group had statistically significant stress reduction scores compared to the control group, which supports further exploration of religion specific mindfulness in all

healthcare disciplines. The vast majority of studies conducted on mindfulness have not focused on any one religion, so this gap is one to further explore as many healthcare workers do have religious beliefs and may be more invested in mindfulness based on their preferred religion or spiritual beliefs.

Koru mindfulness, defined as “an MBI designed specifically to support the development of emerging adults” (Smit & Stavroulaki, 2021, p. 3087) is another mindfulness-based intervention that has been studied, although not nearly as extensively as traditional mindfulness. This research team did a study with undergraduate students (non-nursing) in an online format during what was known to be an incredibly stressful time (i.e., Covid pandemic). Approximately 70 students from two different universities and varying disciplines (non-medically based) were enrolled in this semester-long study. The control group had no activity, while the intervention group followed the Koru structure as “four weekly meetings of approximately 75 min each” and were expected to not only attend each of the four meetings but also practice 10 minutes of daily meditation (Smit & Stavroulaki, 2021). While somewhat similar in structure to other forms of mindfulness, Koru differs in that the elements of “breathing, visualization, mindful walking and mindful eating” are followed in a “prescribed sequence” (Smith & Stavroulaki, 2021, p. 3088). In addition, the Koru program addresses scenarios and situations that college students are most likely to identify with and find stressful, especially pertaining to peer relationships, family relationships, romantic relationships, academic struggles, and after-graduation concerns (Smit & Stavroulaki, 2021). It should be noted that halfway through the semester is when a statewide lockdown due to COVID-19 was implemented, which may have had an effect on Perceived Stress Scale (Cohen et al., 1983) scores, although this was addressed and Institutional Review



Board (IRB) protocol was altered to assess for this effect (Smit & Stavroulaki, 2021). Despite the changes midway through the study, researchers found that the Koru program “effectively increased state mindfulness, decreased stress, and improved sleep” (Smit & Stavroulaki, 2021, p. 3086) for the intervention group, making this a mindfulness intervention worth further studying with the late adolescent/college-aged population.

### **Definition of “Brief”**

There is some inconsistency in what “brief” means regarding mindfulness-based stress reduction. As outlined above, studies vary widely in the time commitment required for mindfulness-based interventions, as this tends to be unique both to the study and to the participant pool. As Bonamo et al. (2015) noted, “the concept of brief mindfulness exercises used across the literature range widely in the duration of administration time from as brief as 5 minutes...to several days...to as long in duration as several weeks or more,” which may likely have an effect on the findings in various studies (p. 541).

However, for the purposes of this study described below, the researcher is well aware of and sensitive to the demanding nature of an undergraduate nursing curriculum. With this understanding, the researcher wanted to explore if a brief (in this setting, described as the time commitment of 5 minutes or less) mindfulness intervention, over the course of a designated time frame (in this instance, the duration of the semester to allow for evaluation of the effect of mindfulness on academic performance in addition to stress reduction), would demonstrate significant reductions in perceived stress, much like the study by Saway et al. (2021). The researchers conducted their study with the aim of researching a brief (defined as time, approximately 4 minutes) intervention done by surgeons, anesthesiologists, and surgery

residents, prior to three different types of surgery cases (defined as routine-elective, complex-elective, and add-on) (Saway et al., 2021, p. 1). Core Flow state was also assessed both pre- and post-intervention, but this is likely more unique to a highly specialized environment like an operating room, or professional athletes (as the researchers discussed), and does not necessarily translate into nursing practice. Participants were recruited voluntarily and the research team included any type of surgeon or resident, but excluded any first-year surgical residents due to general lack of experience in an operating room, which would likely affect their ability to answer pre- and post-survey questions objectively (Saway et al., 2021).

After participants enrolled in the study, they were given a 25-minute overview (at a time most convenient for each individual, not in a group setting) of mindfulness and its importance with stress reduction and then given instructions on how to download the recording onto their phones. The study participants also completed a MAAS (Brown & Ryan, 2003) at the conclusion of the overview and were asked to complete a pre-survey, listen to the recorded mindfulness-based intervention, perform one of the three types of assigned surgeries, and then complete their post-survey. At the conclusion of the study, results overwhelmingly demonstrated a significant reduction in stress, regardless of the participant's medical profession (surgeon, resident, or anesthesiologist), as well as increased core flow (Saway et al., 2021). The researchers outline a number of suggestions for replication of the study and the evaluation of biases that may be present. In addition, replication of the study in a randomized controlled design may be a way to further explore and address any biases that the research team identified. Nonetheless, this study is the first (known in research available for review) to review the benefits and effects of a brief (defined as 4 minutes, over a 1-month period) intervention for surgeons and anesthesiologists.

These promising results only further support that it is possible to implement such techniques in other realms of healthcare, including nursing. While implementation in this brief definition would likely be very beneficial for nurses in a hospital setting, these findings also encouraged the research team for this mindfulness study to implement a similar study design with overwhelmed and time-restricted undergraduate nursing students.

### **Summary**

In reviewing the most current literature available, evidence supports the benefits of nurse educators exploring and implementing mindfulness in the classroom, as the effects may be beneficial. In addition, the benefits of implementing mindfulness in a classroom setting, prior to the start of professional practice, may have positive effects on newly graduated nurses. Nurse educators have an opportunity to provide students with tactical tools for success both in school and in the workplace. However, time is still a concerning factor as most nursing programs and courses will not allow for additional time needed for weekly hour-long sessions, in addition to continued mindfulness work outside of the classroom. Therefore, it is critical to further explore the potential impact of brief mindfulness interventions in the classroom.

## CHAPTER 3: METHODS

### Study Design

This was an experimental, randomized controlled study that examined the effects of a brief mindfulness intervention on student perceived stress and mindfulness as well as on academic performance. Participants were randomly assigned to either the experimental or the control group and were blinded to the researchers, as well as to which group they were in. Students were assigned to folders within the digital learning management system utilized in the class and were only able to open their specifically assigned folder. The folders were labeled as “Mindfulness,” regardless of which recording the student was assigned to listen to, to eliminate any obvious identification of whether they were in the control or experimental group. The experimental group listened to a brief, approximately 3-minute mindful breathing activity. The control group listened to a brief, soothing, and non-specific reflection-based 3-minute recording. These recordings, voiced by one of the researchers of this study, are also being used in another mindfulness study that that researcher is conducting (Dane & Doughtie, 2022). Both recordings also opened with the statement, “We are going to begin this session with a brief mindfulness exercise” (Dane & Doughtie, 2022). Then, depending on which group/recording the participants were assigned to, the recording differed. The experimental group listened to a legitimate mindfulness recording that focused on mindful breathing, whereas the control group listened to a recording that prompted them to do a 24-hour recall of their day while listening to some relaxing classical music. Both recordings were close to the same length, with the mindful breathing recording lasting approximately 10 seconds longer.

Students who opted out of the study were asked to still use earbuds or headphones and were allowed to use their phone or computer to stay engaged during the study time so as not to draw attention to themselves as non-participants. The Perceived Stress Scale (PSS; Cohen et al., 1983) was used to assess stress levels before and after the mindfulness intervention. The MAAS (Brown & Ryan, 2003) was also distributed both pre- and post-intervention as well. The expected finding was that students would have a higher score on the MAAS (Brown & Ryan, 2003) and decreased PSS scores, post-intervention. In addition, exam grades for students in both groups were compared to determine if the weekly mindfulness intervention had any effect on academic performance as well.

### **Project Sample**

Study participants were third year, senior level undergraduate baccalaureate nursing students at a small to moderately sized public/state university. Students who participated in the study were in the Nursing of Children (NUR 443) course that meets on Fridays from 8:00 a.m. until 10:50 a.m. Students ranged in age from approximately 19 through 50, with the average student in the early 20s. The makeup of the fall cohort is traditionally female and primarily English-speaking students. The number of students in this cohort varies but usually averages 50-64 from any given semester.

### **Recruitment**

Participants were recruited on the first day of regular lecture, as the week prior to the official first day of classes is comprised of nursing-specific clinical training that does not occur in a traditional lecture schedule format. Students were informed about the purpose of the study by a faculty member who is not part of the pediatric nursing course. This recruiter led all

mindfulness intervention sessions for the duration of the study and served as the primary contact for students during the study. Informed consent was obtained via electronic survey on Qualtrics, along with demographic questions. The students were then directed to the pre-intervention surveys (MAAS and PSS) via the Qualtrics link. Participants were informed that there was no extra credit for participating and that their responses would not be accessed by the study team until after the conclusion of the semester.

### **Inclusion & Exclusion Criteria**

Students in this course were not excluded from participating in the study for any reason, although they had the option of opting out and not giving consent. Inclusion criteria was for students who were enrolled in the nursing program and were also enrolled in the NUR 443 Nursing of Children course.

### **Protection of Human Subjects**

IRB approval from Radford University was obtained prior to implementation of the study. The study was exempt and there were no conditions of approval noted.

### **Methods Used to Protect Subjects**

Data will be stored in Qualtrics for 3 years and will then be deleted. Data will also be stored in D2L as exam grades (which is not any more of a security concern than any other course the participants are enrolled in). Email addresses associated with responses were downloaded onto computers of the research team members for further analysis and review; however, IP addresses were not stored. In addition, for data analysis from an outside source, data was de-identified and student email addresses were not known to the statistician, only the code assigned to each specific participant.

### **Study Instruments**

Two scales were utilized for the study, as previously noted. The MAAS (Appendix A) is a 15-question survey that measures an individual's day-to-day mindfulness. Sample questions include "It seems I am running on automatic, without much awareness of what I'm doing" and "I find myself doing things without paying attention" (Brown & Ryan, 2003). Participants are asked to score all 15 Likert-style questions on a scale of 1 ("almost always") to 6 ("almost never"). This scale is copyrighted and free for public use and has been utilized in the majority of the studies noted in the literature review. Cronbach's alpha has been scored anywhere between  $>.80$  to  $>.92$  in a variety of studies, many of which include translation of the scale into another language (González-Blanch et al., 2022; Ruiz et al., 2016).

The PSS (Appendix B) is similar in format to the MAAS, as it is a 10-question survey that asks participants to rate specific types of stress on a scale of 0 to 4, with 0 as "never" and 4 as "very often" (Cohen et al., 1983). This scale is intended for participants to answer questions when evaluating their life and life circumstances for the past month. Other studies have used a modified form of this scale and adjusted the timeframe to fit the study design (i.e., past week, past 2 weeks, etc.), but for the purposes of this study, the scale was used as written. Like the MAAS, the PSS is copyrighted, free for public use, and has been used in hundreds of studies. It should be noted that the PSS was originally a 14-question scale developed in 1983, but then was shortened to a 10-question scale in 1989 (Lee, 2012). Lee (2012) noted that the Cronbach's alpha for the PSS (Cohen et al., 1983) has been evaluated at  $>.70$  in more than 12 studies that she evaluated.

**Procedure**

On the first day of regular lecture, a faculty member (not an instructor of this course) was present to give an overview of the study, so students would not feel coerced to participate. This faculty member is known to the students but does not have them in class at this level in the nursing program, so she is a familiar faculty member but not directly involved with the students in this course. This faculty member provided the students with an overview of the study and the purpose of the study. She also addressed any questions before proceeding. After review, students were given a link that they could access on either their computer or cell phone to review and give consent. Once they gave consent, the student then continued with the electronic link to fill out the MAAS and the PSS (attached below). Both the MAAS and PSS followed the exact scale/question format as the original surveys (not an abbreviated/amended version). After all students completed the survey, they then went to D2L and the NUR 443 shell to access their preassigned folder. Students were only able to access the folder they were randomly assigned by Dr. Dane. The participants then listened to their assigned recording (either intervention/mindfulness or control/soothing) using headphones or earbuds. For students who did not consent/were not participating in the study, they were free to utilize this time as they wished (in a non-disruptive manner). After participants finished listening to their assigned recording, lecture could begin. Students who participated in this study followed this exact procedure each week, prior to the start of lecture or the exam, for listening to their assigned recording. At the end of the semester, on the last day of class/day of the Kaplan exam, students filled out their post MAAS and PSS scales using a provided Qualtrics link and then listened to their assigned recording for the last time.



### **Data Management & Analysis**

Data collection occurred at the beginning of and at the conclusion of the fall semester, which starts in the end of August and concludes the second week of December (data were not collected during university designated holidays when lectures were not held, such as fall break or Thanksgiving break). All survey tool questions were implemented utilizing Qualtrics surveys. Demographic questions included the following: 1) What is your age? 2) Have you ever failed a previous nursing course? 3) Have you previously withdrawn from a nursing course? 4) Have you had experience with other forms of mindfulness? 5) What kinds of stressors/obligations outside of school might school more difficult? 6) Do you feel you have adequate time to prepare for lecture? 7) Do you feel you have adequate time to prepare for exams? 8) How many degrees have you earned prior to enrolling in this nursing program?

Data were de-identified for statistical analysis by using unique participant identifiers to link scores on post-survey tool responses. A research associate from a local university was hired for the statistical analysis. All analyses were conducted using the statistical software R (R Core Team 2020, R version 4.1.0). Figures were generated using the R package “ggplot2” (Wickham, 2016). All statistical analyses, except linear models, were run using base R, while linear models were run using the R package “lme4.” Some responses were removed from post survey results due to lack of data. There was one participant who appeared to be an outlier for the PSS (Cohen et al., 1983), but these data were not removed from analysis because they did not appear to be a data entry error or mistake in data collection.

In evaluating exam scores between groups, ANOVA was not appropriate since all test scores combined are non-normally distributed; therefore, the analyst used Shapiro-Wilks Test of

Normality, Kruskal-Wallis Test, Wilcoxon Rank Sum Test, and Mann-Whitney-U tests in evaluating differences between group exam scores.

When evaluating post-survey differences between the intervention and control groups for MAAS (Brown & Ryan, 2003) scores, Shapiro-Wilks Test of Normality and t-tests were used for analysis. For the post-survey PSS (Cohen et al., 1093) scores, Shapiro-Wilks Test of Normality and Mann-Whitney-U tests were performed.

## CHAPTER 4: RESULTS

The aim of this study was to evaluate whether a brief mindfulness intervention in a nursing course would result in higher mindfulness, decreased perceived stress, and improved academic performance. The study was randomized and controlled, with participants blinded to the course instructors and also blinded to the intervention or control. At the conclusion of the data analysis, it was determined that the intervention group did not have increased mindfulness, decreased perceived stress, or improvement with academic performance when compared to the control group.

### **Description of the Sample**

Participants in the sample were predominately female (less than four male students) and ranged in age from 20 to 37, with a mean age of 22 years old. There were 57 students enrolled in the course. It should be noted that not all participants answered every question. This was a traditional, undergraduate baccalaureate cohort and only three of the respondents reported having achieved a degree prior to this program. However, only 47 respondents answered this question, so this number could possibly be higher. Nonetheless, it is still an accurate reflection of this traditional cohort as the overwhelming majority of the students had no prior degrees.

Students were also asked about previous nursing courses (whether they had failed a previous course or if they had withdrawn from a previous nursing course). Eight students reported that they had failed a previous nursing course, whereas only five students reported that they had previously withdrawn from a nursing course. Prior experience with mindfulness was also assessed, with only six students reporting previous experience with other forms of mindfulness.

Preparation for lecture and exams was also explored. Twenty-five (41%) of participants felt that they did not have adequate time to prepare for lecture, with 28 (46%) noting that they did not have adequate time to prepare for exams. These questions were important to address because exams may feel very “high stakes” to students and maintaining an expected minimum grade in a rigorous nursing course can add to student perceived stress.

Students were asked what kinds of stressors and obligations outside of school might make school more difficult. This was a free text field in the survey and many answers were similar in nature (e.g., “work,” “bills,” “financial stress,” “job stressors,” “isolation from family and friends,” “family stressors,” “sports,” and “sorority”). Some students also noted “covid” related stressors, while other students also identified anxiety and depression, lack of sleep, and lack of self-care as ongoing topics that might make school more difficult for them.

### **Mention of Change in Planned Analysis**

It should be noted that the research team intended to compare individual pre- and post-survey scores (for both MAAS and PSS) within groups, using a mixed model ANOVA; 2 (Mindfulness vs. nonspecific/relaxation- between group variable) x 4 (each exam- within subject/repeated measures variable) x 2 (pre-test and post-test- within subject/repeated measures variable) approach. However, due to user error when the Mindfulness pre-intervention survey was distributed, email addresses were not captured, which was needed to identify individual student responses and scores. Therefore, after discussion, the study team decided to move to a post-test only design, with the assumption that students would likely have similar scores on the MAAS and PSS prior to the start of the study. This did weaken the study design, but it was

determined that findings of the study would still have some benefit and therefore the study proceeded as planned.

**Hypotheses Testing for Exam Grades**

H<sub>0</sub>: There is no significant difference in test scores between treatment groups.

H<sub>A</sub>: Students receiving the breathing/mindfulness treatment will have significantly higher test scores than students in the control group.

When test scores are broken down by test # and group, there does not appear to be any significant difference between groups and how they scored on each test, although the same trend in test scores without grouping by treatment is still apparent), as demonstrated in Table 1.

**Table 1**

*Exam Grades*

Test #	Mean	Median	Range	StDev	
Overall (n=50)					
1	89.63	91.00	77-100	5.738	
2	81.14	82.00	58-98	7.954	
3	87.42	88.00	74-100	7.987	
Final	88.24	89.00	71-100	7.224	
Treatment Group (n=30)					
1	89.80	91.00	77-100	6.435	
2	81.77	81.50	70-98	7.664	
3	87.30	85.00	74-100	8.742	
Final	87.87	88.0	71-100	8.220	
Control Group (n=20)					
1	89.38	90.50	80-96	4.648	
2	80.20	82.50	58-96	8.483	
3	87.60	89.00	75-100	6.916	
Final	88.80	89.5	74-98	5.560	

The results of the test-specific analyses show that students receiving the mindfulness treatment did not perform better on exams than the control group students over the course of the semester. Therefore, based on the results, we failed to reject the null hypothesis, indicating there is no significant difference in test scores between treatment groups, and no correlation between mindfulness and academic performance.

**Mindfulness Analysis**

Shapiro-Wilks Test of Normality:  $p = 0.2574$ , therefore the data (all MF survey scores combined) are normally distributed, making a 2-sample t-test appropriate. Assumptions of a t-test were met; samples were independent, data is normally distributed, no significance in variance between samples (test of unequal variance,  $p = 0.5381$ ). T-test results indicate no significant difference between treatment groups on Mindfulness Survey Scores at the end of the semester,  $p = 0.9478$ . See Table 2.

**Table 2**

*MAAS and PSS Scores by Group*

Metric	Mean	Median	Range	StDev	
Overall (n=50)					
Mindfulness	3.372	3.433	1.4-5.8	0.863	
PSS	20.438	21.000	0-29	5.519	
Treatment Group (n=30)					
Mindfulness	3.366	3.467	1.4-5.8	0.917	
PSS	19.759	21.000	0-29	6.534	
Control Group (n=20)					
Mindfulness	3.382	3.400	1.8-5.1	0.797	
PSS	21.474	21.000	16-27	3.356	

**Hypothesis Testing for Mindfulness**

H<sub>0</sub>: There is no significant difference in Mindfulness scores between treatment groups.

H<sub>A</sub>: Students receiving the breathing/mindfulness treatment will have significantly higher Mindfulness Survey scores than students in the control group.

Based on the results, we failed to reject the null hypothesis, indicating there is no significant difference in Mindfulness scores between treatment groups.

### **Perceived Stress Analysis**

Shapiro-Wilks Test of Normality:  $p < 0.001$  (0.0001241). This means the data (all PSS survey scores combined) are not normally distributed, meaning a 2-sample t-test is not appropriate. We can use a Mann-Whitney-U test; assumptions are that samples are independent, and data is continuous, both assumptions are met. Results indicate no significant difference between treatment groups on Test 3,  $p = 0.6566$ .

### **Hypothesis Testing for Perceived Stress**

Shapiro-Wilks Test of Normality:  $p < 0.001$  (0.0001241), indicating that the data (all PSS survey scores combined) are not normally distributed, making a 2-sample t-test inappropriate. A Mann-Whitney-U test was utilized instead; assumptions are that samples are independent, and data is continuous, both assumptions are met. As Table 2 shows, results indicate no significant difference between treatment groups on Test 3,  $p = 0.6566$ .

H<sub>0</sub>: There is no significant difference in Perceived Stress scores between treatment groups.

H<sub>A</sub>: Students receiving the breathing/mindfulness treatment will have significantly higher Perceived Stress scores than students in the control group.

Based on the results, we failed to reject the null hypothesis, indicating there is no significant difference in Perceived Stress scores between treatment groups. In addition, there was

no correlation between PSS scores and academic performance, or between MAAS scores and PSS scores.

### **Additional Findings**

As previously outlined, there does not appear to be any statistically significant effect of treatment group on test scores, MAAS (end of semester), or PSS (end of semester). However, there was an interesting find when visually comparing all student (both intervention and control groups) PSS scores at the end of the semester. There is no indication that the mindfulness intervention (or even control) was responsible for this overall reduction, and this was actually the opposite of what the researcher expected to find, as student perceived stress is actually more likely to increase as the semester progresses and testing/grades feel “higher stakes” (Taylor et al., 2020). Unfortunately, without having the unique student identifiers (i.e., emails not captured in pre-survey responses) to test differences in pre- and post-survey data split out by groups, this was an incomplete analysis. The team would not be able to say definitively that the mindfulness intervention did not affect perceived stress or increased mindfulness, although the assumption would be that it did not (given no significant differences noted as previously discussed). Due to the error in collecting email addresses in the pre-intervention survey, the researcher could not evaluate individual participant correlations between MAAS and PSS scores, or between MAAS, PSS, and Exam scores.

### **Summary**

At the conclusion of the data analysis, the research team did not receive the results that were desired. While disappointing, valuable information was still obtained and gives support for replication of the summary with different approaches and perhaps different student participants.



In addition, it is worth exploring the decreased PSS scores and what might have prompted this result. This has been seen in other studies that did not demonstrate statistically significant increases in mindfulness, but yet, students subjectively reported increased self-efficacy, confidence, and overall well-being (Taylor et al., 2020). Therefore, while mindfulness interventions may not necessarily decrease stress, there are other psychological traits that could be evaluated and measured with brief mindfulness interventions.

## CHAPTER 5: DISCUSSION

### Relationship of Findings to Prior Research

The aim of the study was to evaluate three separate concepts: 1) if a brief mindfulness intervention would increase mindful attention awareness scores over the course of a semester, 2) if a brief mindfulness intervention would decrease student perceived stress scores over the course of a semester, and 3) if a brief mindfulness intervention improve academic performance over the course of a semester (in this study, measured by exam grades). After analysis, none of these three concepts were demonstrated in this study. However, there are several important points of discussion that may explain the lack of desired results, as well as for suggestion for future replication.

### Limitations

First, while this participant sample is not wildly different in makeup than any other nursing cohorts prior to the COVID-19 pandemic, there is a stark contrast with this particular cohort versus cohorts of the past. Specifically, this cohort was the first group of nursing students to enter the nursing program after the start of the pandemic. Unfortunately, they have never known a nursing education world without COVID-19 and have never known what it is like to experience clinicals in a non-pandemic world. It is possible that this has added an additional level of stress on top of an already stressful and rigorous undergraduate program. If this is the case, then these students may have already had higher stress scores to begin with than students pre-pandemic, which could have produced higher levels of stress that are not as easily influenced by interventions such as mindfulness.

While one could argue that this would not necessarily matter because stress could have still decreased over the course of the semester due to a mindfulness intervention, that is not necessarily true for these students. COVID-19 is a constant state of uncertainty in healthcare, and most certainly also in academia. Students often had changes in clinical requirements and availability, week to week, throughout the semester, given fluctuating community levels of the virus. Unlike the pre-pandemic world, these students were completely unable to have any certain plans in place and likely were in a heightened state of stress at all times. It would be interesting to further study this phenomenon, as nursing students today have had an entirely different nursing school experience than students from even two years ago. In addition, given the changes in society and healthcare, there may have been greater buy-in from students if this researcher had provided an educational component of the benefits of mindfulness, prior to the start of the study.

As far as academic performance, other studies have been done to determine if mindfulness interventions can affect academic performance. A team of researchers in California implemented a brief mindfulness intervention with a group of psychology students and were unable to determine a correlation between the intervention and academic performance (Yamada & Victor, 2012). In fact, the researchers noted, “literature has demonstrated that there is little relationship between subjective confidence measures and objective performance in terms of some cognitive tasks such as memory accuracy and visual perception” (Yamada & Victor, 2012, p. 143). Likewise, Calma-Birling & Gurung (2017) were also unable to link brief mindfulness intervention to improved exam scores in their study. Their mindfulness intervention was similar in time (5 minutes) to the one in this study, and they proposed that the shorter time period was not enough to produce significant effects seen in similar studies that implemented lengthier

interventions (Calma-Birling & Gurung, 2017). Given that the nursing program is competitive and rigorous, nursing students are likely to already have higher grade point averages and academic aptitude, resulting in higher grades. Some of the students in this course were making high As with little room to prove that there was improvement in their academic performance. This is likely to be the most difficult concept to explore, but worth further investigation and study.

### **Anecdotal Observations**

Last, it is important to include anecdotal observations from the faculty member who helped by facilitating the intervention prior to the start of class each week. While these observations are subjective, this particular faculty member has taught at the university for 20+ years and traditionally has more involvement with each cohort in her administrative role. She did note that students seemed particularly angry and frustrated over the course of the semester. While this team intentionally had this faculty member be the “face” of the study, students may have still felt as though they were involved in the study designed to benefit the faculty who were leading the study (these names were on the consent form). Every attempt possible was made to eliminate any perception or sense of coercion, but this was not entirely impossible given the consent form.

In addition, this faculty member noted that she observed a steep drop-off in participation over the course of the semester. Students were often late to class (approximately five to six per week by her estimate) and when one student was reminded that her lateness prevented her from listening to her recording at the start of class, the student responded, “I don’t care.” This indicates that there perhaps was not a dedicated buy-in from the students who initially consented

to participate, and perhaps they also did not take the study seriously as participants. The faculty member also felt like as the semester progressed, she noticed more and more students engaged in other non-study activities during the implementation time, which led the team to believe that students were not logging in and listening to their assigned recording weekly. Without the consistent participation as the study was designed, this would most certainly result in inaccurate scores (especially if students filled out both the pre- and post-survey and only listened to their assigned recording a few times over the course of the semester). Therefore, even though the results were not statistically significant when examining the effect of the mindfulness intervention, it could be that this particular cohort of nursing students did not benefit due to lack of true interest and participation. As discussed in the literature overview, many studies that have implemented mindfulness interventions (even brief interventions, as in Saway et al., 2021) have demonstrated statistically significant improvements in mindfulness and decreased perceived stress, so it is possible that if replicated with a different cohort, results may be different.

### **Evaluation of Theoretical Framework**

Overall, Bandura's theory of self-efficacy (1997) is entirely appropriate in this study, for several reasons. One such reason is the student sample involved in this study, as nursing students are constantly learning new skills, new coping methods, new communication techniques, and more, in preparation for providing nursing care for patients. A strong sense of self-efficacy is critical in the nursing profession, as one must be confident in their ability to master new skills and apply those skills on a consistent basis. This directly ties into stress management and mindfulness in the medical setting, as these concepts are critical for safe and effective patient care. Nursing students will find themselves caring for a patient who receives a terminal

diagnosis, and then minutes later may enter the room of another patient who is being discharged home after a successful surgery or procedure. The ability to be mindful, or “in the moment” with each of these patients, without letting their thoughts and feelings about the other patient’s circumstances affect their current moment is imperative to meaningful nurse-patient relationships. In addition, the ability to manage stress in a high-stakes workplace is also critical for personal success and patient safety.

Nurses must learn and utilize tools and skills to help them effectively reduce stress and prevent burnout. Without being able to learn and apply skills related to mindfulness and stress reduction, students may struggle immensely as they enter the nursing profession. A strong sense of self-efficacy serves as a firm foundation in any profession, but most certainly those in medicine or nursing. With this emphasis on Bandura’s theory, it would be valuable to further explore the relationship between a brief mindfulness intervention and self-efficacy.

### **Implications for Future Research**

There would be benefit to replicating this study, but after evaluation of the results of this current study, there are changes to the design that may likely be beneficial. At the time of this study, COVID-19 was still a predominant concern in society and resulted in great academic uncertainty with both didactic and clinical components of this course. Since this study was implemented, there have been several other studies evaluating COVID-19 and its effect on student perceived stress, but to this author’s knowledge, no other studies evaluating brief mindfulness interventions and its effect on perceived stress have been done.

As previously mentioned, students across the globe have reported increased stress secondary to COVID, and many students in this study mentioned COVID-related concerns as

stressors that impact their ability to be successful in school. While students in other disciplines (non-medical) are certainly worried and stressed pertaining to the pandemic, nursing students likely have a much higher rate of stress due to the risk they endure every day in the clinical setting with increased exposure to COVID (as compared to the general population of college students) and the uncertainty of their required clinical experiences/hours.

Another suggestion for replication would be to design the study in a way that students were more likely to have greater and more consistent participation. While some drop-off over the course of a study is expected, it may be that students in this study had a higher rate of drop-off. The room where lecture took place was a large lecture space and students entering and exiting via the doors were loud and may have distracted those who were engaged in listening to their recording. With this continued interruption, students may have become frustrated and determined that this activity was not useful because they could not be “in the moment” with excess noise. Other studies as previously mentioned have had students complete mindfulness activities outside of class, but there is also no way to guarantee that those were done either. The research team felt that allowing for this study to take place during class time would eliminate stress the students may potentially feel with having additional required independent work outside of class. Retrospectively, the lecture space was not really conducive in creating a reflective and mindful environment.

Last, after the study was completed, the research team was unable to view how many times each student logged into their assigned folder over the course of the semester. If this study were replicated the exact same way, it may be helpful to keep track of this information and exclude any study participants who did not listen to their assigned recording for >50% of the

duration of the study. Study participants who did not participate as expected but still filled out the pre- and post-surveys likely skewed the results and did not contribute to a reflective response.

### **Implications for Practice/Health Policy/Education**

Every discipline in the healthcare profession could benefit from education and training in increased mindfulness and stress reduction. Healthcare workers face intense emotional trauma, human suffering, and distressing situations regularly (depending on specific place of employment or practice). However, while many in the healthcare profession may be familiar with the concept of mindfulness, it is not a common occurrence (at least at the time of this study) that mindfulness and stress reduction techniques are implemented in individual college/healthcare curriculums. In addition, it would be safe to assume that the majority of employees in healthcare do not utilize mindfulness and stress reduction tools until after they are needed (i.e., not as a primary prevention method, but rather as a response to already present stress). By making mindfulness a foundational expectation prior to entering nursing practice, there is the possibility that there may be decreased burnout and higher job satisfaction for nurses in all specialties. There is much to be done with this concept in research, but the promise of known benefits is encouraging.

### **Conclusion**

While this particular study did not demonstrate increased mindfulness, decreased perceived stress, or academic improvement with this cohort of nursing students, research does support that brief mindfulness interventions can have a significant impact on all three concepts. Even while significant findings in research have also not been consistently replicated, continued replication of similar studies, especially post-pandemic, are important in evaluating the benefits



of mindfulness with nursing students in particular. The benefits of mindfulness are far-reaching, but there are certainly benefits beyond stress reduction and academic improvement than can and should be studied.

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Appendix A

Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, 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.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never

I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
It seems I am "running on automatic," without much awareness of what I'm doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	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	2	3	4	5	6
I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6

Appendix A

	1	2	3	4	5	6
	Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	Almost Never
I drive places on 'automatic pilot' and then wonder why I went there.	1	2	3	4	5	6
I find myself preoccupied with the future or the past.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I'm eating.	1	2	3	4	5	6



Appendix B

PERCEIVED STRESS SCALE

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 circling *how often* you felt or thought a certain way.

Name \_\_\_\_\_ Date \_\_\_\_\_

Age \_\_\_\_\_ Gender (Circle): **M** **F** Other \_\_\_\_\_

**0 = Never    1 = Almost Never    2 = Sometimes    3 = Fairly Often    4 = Very Often**

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. In the last month, how often have you been upset because of something that happened unexpectedly?                 | 0 | 1 | 2 | 3 | 4 |
| 2. In the last month, how often have you felt that you were unable to control the important things in your life?     | 0 | 1 | 2 | 3 | 4 |
| 3. In the last month, how often have you felt nervous and "stressed"?  | 0 | 1 | 2 | 3 | 4 |
| 4. In the last month, how often have you felt confident about your ability to handle your personal problems?         | 0 | 1 | 2 | 3 | 4 |
| 5. In the last month, how often have you felt that things were going your way?                                       | 0 | 1 | 2 | 3 | 4 |
| 6. In the last month, how often have you found that you could not cope with all the things that you had to do?       | 0 | 1 | 2 | 3 | 4 |
| 7. In the last month, how often have you been able to control irritations in your life?                              | 0 | 1 | 2 | 3 | 4 |
| 8. In the last month, how often have you felt that you were on top of things?  | 0 | 1 | 2 | 3 | 4 |
| 9. In the last month, how often have you been angered because of things that were outside of your control?           | 0 | 1 | 2 | 3 | 4 |
| 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? | 0 | 1 | 2 | 3 | 4 |

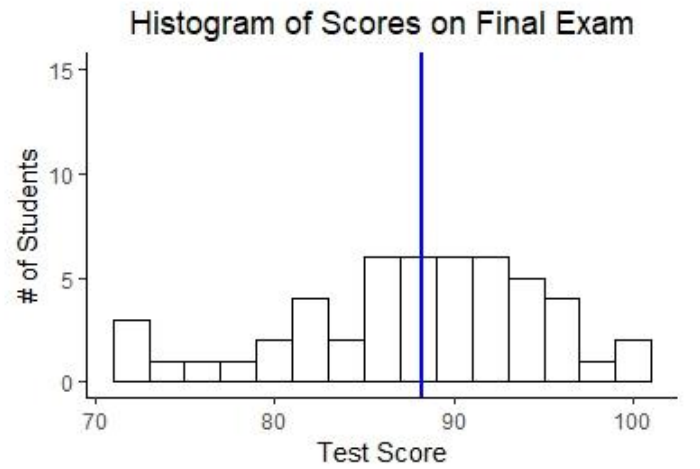
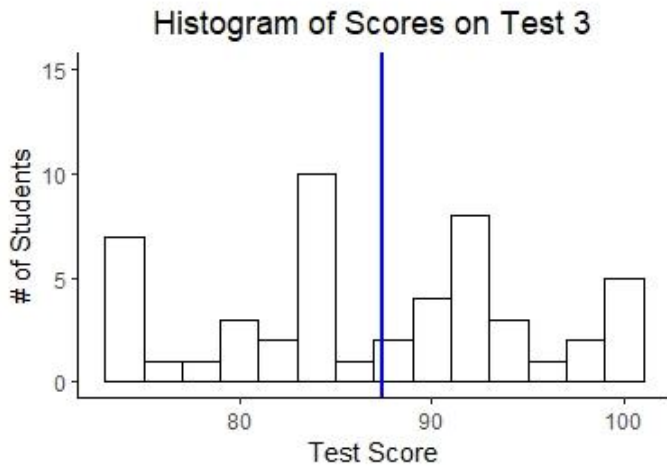
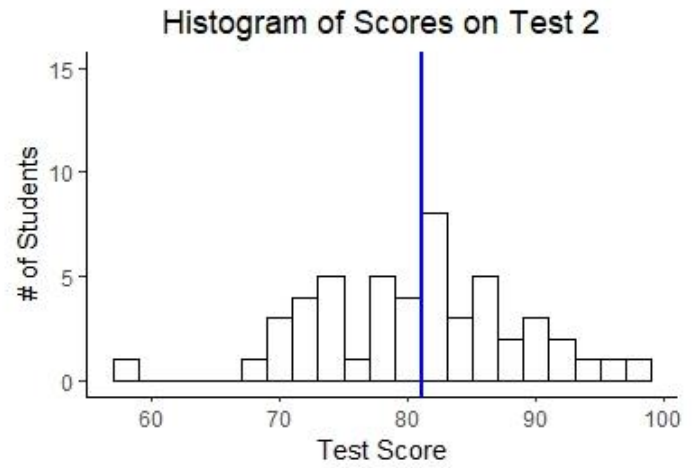
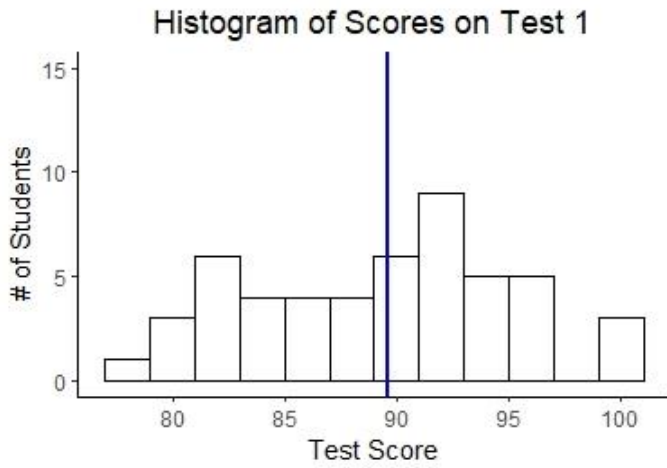


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The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396.  
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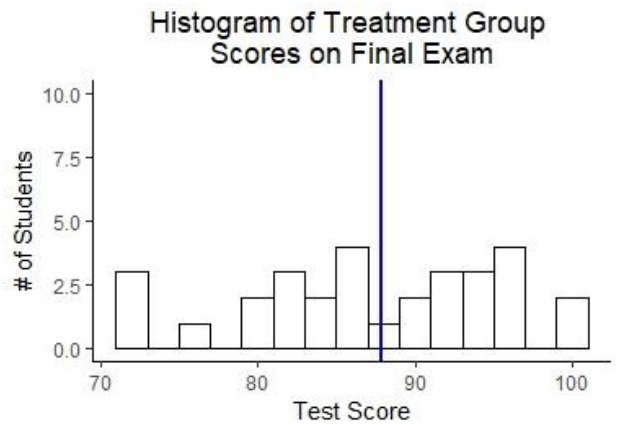
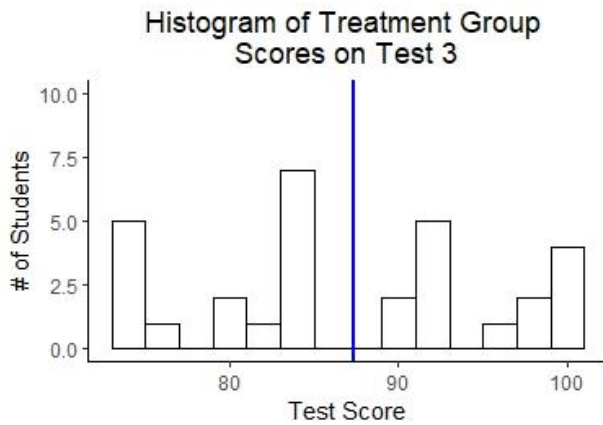
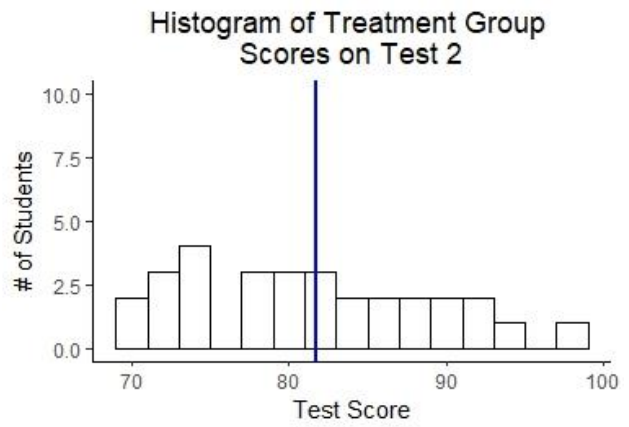
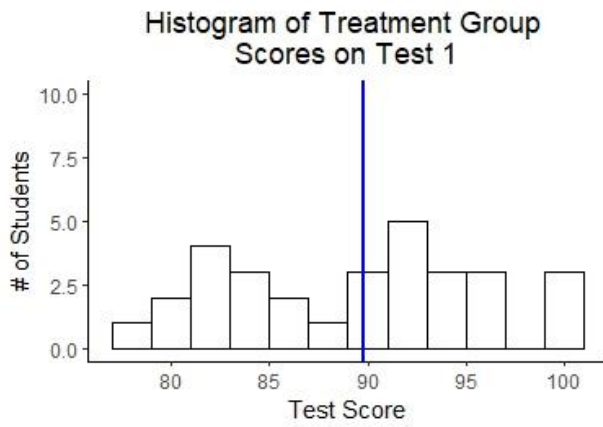
Appendix C

ALL STUDENTS- exam scores



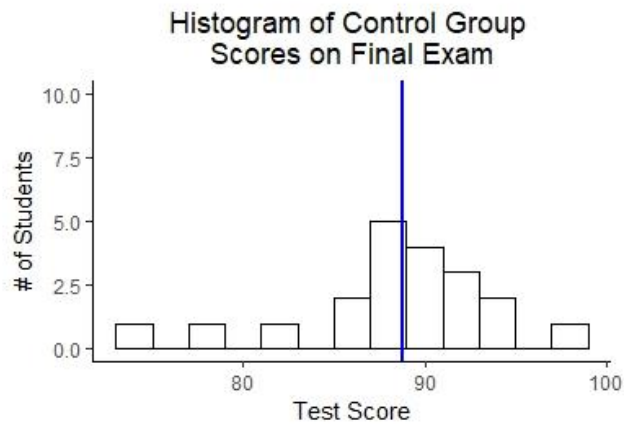
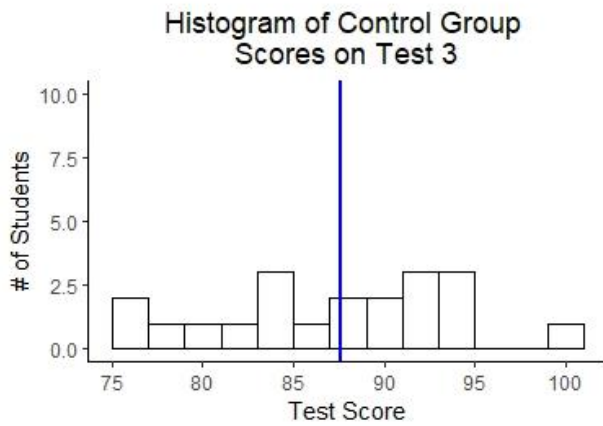
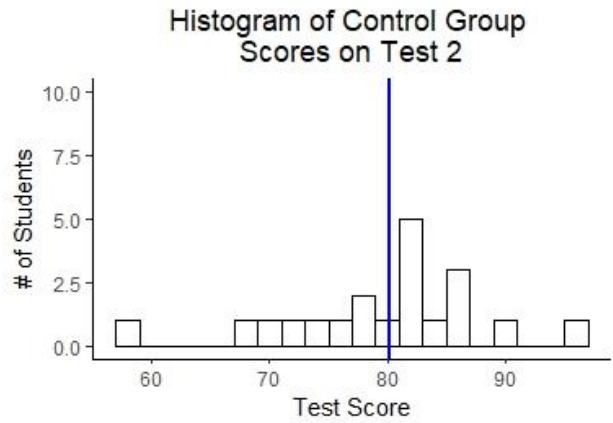
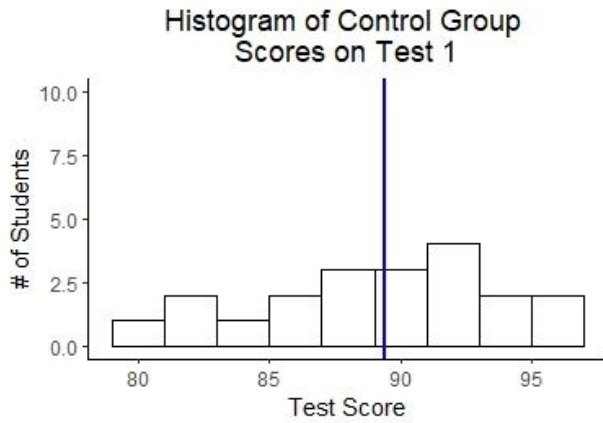
Appendix D

TREATMENT GROUP- exam scores

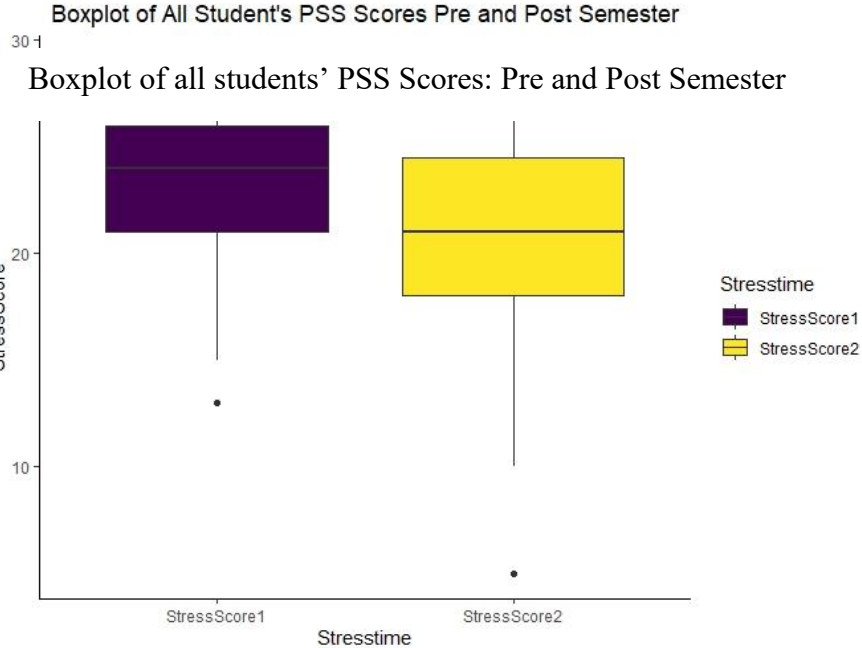


Appendix E

CONTROL GROUP- exam scores

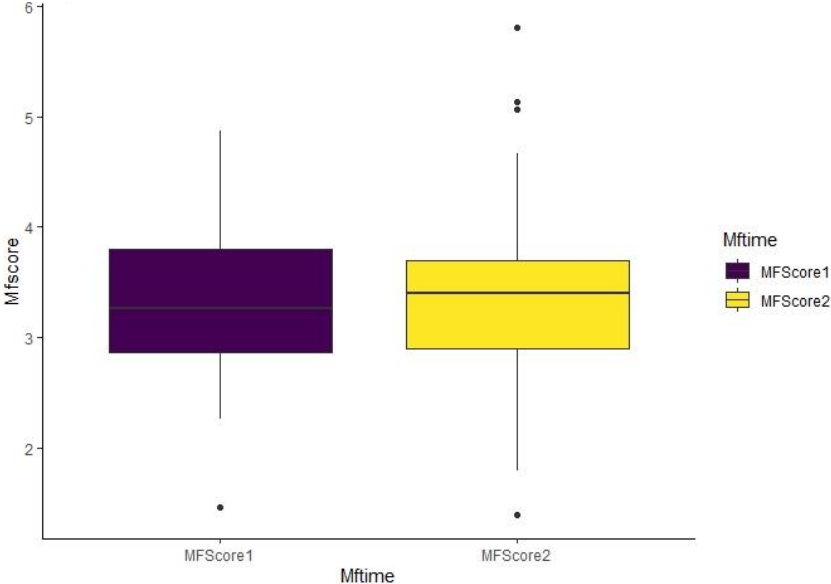


Appendix F



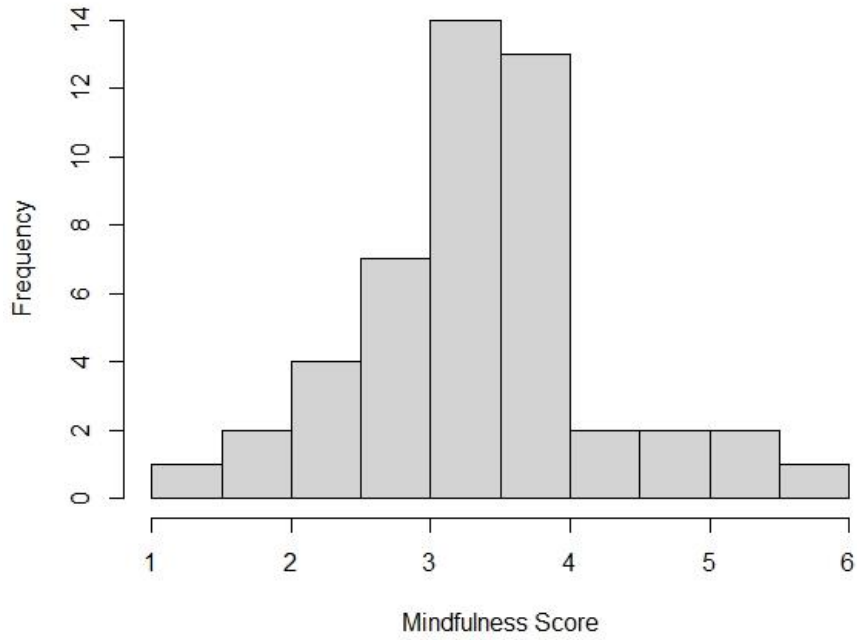
Appendix G

Boxplot of all students' MAAS Scores- Pre and Post Semester



Appendix H

**Histogram of All Student's Post-Semester Mindfulness Scores**



**Histogram of All Student's Post-Semester Perceived Stress Survey Scores**

