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A Mixed-Method Study of the Effects of a Self-Guided Mindfulness Based Stress Reduction Audio Intervention on Teacher Stress in a Secondary School

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A MIXED-METHOD STUDY OF THE EFFECTS OF A SELF-GUIDED MINDFULNESS
BASED STRESS REDUCTION AUDIO INTERVENTION ON TEACHER STRESS IN A
SECONDARY SCHOOL

by

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Submitted in Partial Fulfillment of the Requirements

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DEDICATION

This work is dedicated to my students and my colleagues. Stress is pervasive and at times overwhelming for both students and teachers alike. I hope that what I have learned throughout this process will help guide me and those around me to positive and meaningful change.

ACKNOWLEDGEMENTS

No dissertation is written in a void. This work is only possible because of the excellent work that has been done before me. This dissertation is only writing because the support of so many people in my life. I would like to thank my district for allowing this research. I would like to thank my wife, Annabelle, for her unending support and unfaltering faith that everything would work out. I couldn't have done it without her. I would like to thank my dissertation chair, Dr. Terrance McAdoo, for all of his support and guidance throughout this process. I would also like to thank the other members of my dissertation committee—Dr. Todd Lilly, Dr. Leigh D'Amico, and Dr. Yasha Becton—for all of their feedback and advice throughout this process. Thanks also to Tommy and Becky for starting me on this mindfulness journey. Their wonderful energy is largely why I started to investigate mindfulness in the first place. Lastly, I would like to thank my dog Bones. All parts of my life—including this—are better because of her.

ABSTRACT

Teachers have especially high levels of stress and this stress can have severe consequences for their health, their students and their district. This study used an action research, explanatory sequential mixed-methods approach to examine the effectiveness of a self-guided audio-based Mindfulness Based Stress Reduction intervention on reducing teacher stress. Teachers self-selected into experimental ($n = 14$) and control groups ($n = 24$), and took State Trait Anxiety Index pretest and posttest surveys. The experimental group also completed participation logs and were interviewed about their experience. The MBSR intervention was found to have a statistically significant reduction in teachers for both STAI measures of stress. The interviews showed that teachers demonstrated increased attention regulation, increased body awareness, increased emotional regulation and a change in perspective of the self. Interviews also suggested that time, perceived legitimacy, and discomfort may all be factors in mindfulness completion. Participants had low participation fidelity for the MBSR intervention, and there was no correlation found between participation and stress reduction. Results and finding of this study were used to create recommendations for future practice and suggested directions for future research.

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LIST OF ABBREVIATIONS

MBI.....	Mindfulness Based Intervention
MBSR	Mindfulness Based Stress Reduction
STAI.....	State-Trait Anxiety Inventory

CHAPTER 1

INTRODUCTION

1.1 Introduction

Glenmoore High School may be undergoing the most stressful year of its sixty-one-year existence. This is partially to be expected, as Glenmoore High is returning to in-person learning after a year of online and hybrid learning due to COVID-19. There are new routines to learn, new expectations to navigate, and new social situations for both teachers and students alike. All of these items are significant sources of stress. In addition, students did not learn as much content as they normally learn in the year of hybrid and online learning. This means they are starting each class significantly behind. This is a source of stress for students and for the teachers who are worried about adequately preparing them for end of year exams. Unfortunately, these are not the only stressors the staff at Glenmoore are facing.

On the first day of the school year, the district superintendents and legal team are present for the first staff meeting at Glenmoore. They begin the year by informing us that our principal has been placed on administrative leave pending a title IX investigation. They explain this is occurring because the principal and the district are being sued by former students for continually and systematically failing to protect them from sexual assault and the fallout of those assaults. The new interim principal introduces himself and then asks for questions.

What follows is an emotional outpouring from the teaching staff voicing feelings of anger, hurt, and betrayal. Teachers wonder how the district could have possibly let such an atrocity occur, they stand up and yell for changes to be made. They call for the resignation of the rest of the administrative staff. It is a community torn apart and reeling from the news. The meeting leaves the staff divided into groups that want to support the old principal (because they cannot believe he is responsible), and groups that want to burn him to the ground for everything he did.

The divided staff festers like a wound in Glenmoore. A few weeks into the school year, a routine staff meeting devolves in to a screaming match. Teachers are standing up and swearing at each other. About half of the staff walk out of the meeting. Teachers are crying. Some of them walk out and leave for the day. It is becoming difficult for teachers to have a normal day at school without focusing on the stress and trauma of the past and present. The instability and uncertainty of the day wears on teachers.

Turnover follows. Administrators are placed on leave and transferred. Teachers who have been there for twenty years leave. New hires quit. What was once a stable community is now reeling with change. It is an environment that has lost its structure and routine.

Perhaps Glenmoore was especially vulnerable to the cumulative effects of stress because it entered this year still recovering from the trauma of previous years. There was a mass shooting at the local community grocery store in which students of Glenmoore and their parents were killed. A student died in a skiing accident in front of all of his friends. A student committed suicide. All of this trauma is still fresh and raw for Glenmoore community.

Amidst all the chaos, one thing is certain: the teachers at Glenmoore are experiencing an immense amount of stress. Something needs to be done to help this school and this community. In previous years, a few teachers introduced mindfulness practices in an effort to help the staff. This effort was met with a divided response: some of the staff were grateful and some of the staff were extremely skeptical. More data was needed alleviate concerns and to determine effectiveness. The goal of this study is to test a mindfulness-based intervention to see if it reduces the stress for teachers at Glenmoore High.

1.2 Statement of the Problem of Practice

Teachers experience the greatest percentage of high daily stress out of any occupational group (Gallop, 2014). The most common causes of this stress are the organization and leadership of the school, the demands of the job, the work resources that are available to teachers and the social and emotional competence of the teachers (Greenberg, Brown, Abenavoli, 2016). All of these stressful elements are present at Glenmoore. Supportive school cultures with good leadership are linked to better job satisfaction and happier teachers (Johnson, Kraft, & Papay, 2012; Kapadia, Coca, & Easton, 2007). Unsatisfactory relationships with administrators and colleagues, such as those demonstrated at Glenmoore, are directly linked to increases in teacher stress (Kyriacou, 2001). Turnover of administration is also linked with increased teacher stress (Beteille, Kalogrides, & Loeb, 2011). Teachers at Glenmoore also have to manage students with behavior problems and work with difficult parents, both of which are shown to produce chronic stress and increase teacher depression (Greenberg et al., 2016). Furthermore, a lack of autonomy and control, like that experienced by teachers at

Glenmoore is also linked to increases in stress (Verhoeven, Maes, Kraaij, & Joekes, 2003).

Teacher stress has enormous negative consequences. It affects the personal health of teachers, the achievement of their students, and has a high monetary cost for the district (Greenberg et al., 2016). Stress influences health behaviors. It more likely for teachers to develop chronic illnesses, it causes exhaustion, and it lowers their quality of life (McNeely, C., & Blanchard, J., 2009; Salleh, 2008; Schneiderman, Ironson, & Siegel, 2005). Stressed teachers are less likely to get enough sleep and demonstrate high levels of cortisol, which in turn is associated with many negative health outcomes (Katz, Greenberg, Klein & Jennings, 2016). In addition, teacher stress has direct consequences for students. Teachers who are highly stressed do not create environments that are beneficial for student learning (Greenberg et al., 2016). As a result, students who are around highly stressed teachers demonstrate lower academic performance and poorer social-emotional outcomes (Hoglund, Klinge, & Hosan, 2015). Finally, teacher stress is linked to teacher burnout and teachers leaving the profession (Raue & Gray, 2015). Teacher turnover in public schools costs the country an estimated 7.3 billion dollars every year in sunk costs training new teachers. (National Commission on Teaching and America's Future, 2007).

However, certain programs might be able to reduce teacher stress. Individual interventions that increase the social-emotional competency of teachers reduce teacher stress (Greenberg et al., 2016; Roeser, 2014). The better the social-emotional competency of teachers, the better their ability to deal with stress, the better the students behave in their classrooms, and the more likely they are to report job satisfaction and a sense of

accomplishment (Brackett, Palomera, Moja-Kaja, Reyes, & Salovey, 2010; Greenberg et al., 2016; Li-Grining, Raver, Champion, Sardin, Metzger, & Jones, 2010).

While it is known that teachers are stressed, the causes of this stress, that teacher stress has an enormous number of negative impacts, and that individual interventions that build social-emotional competencies can reduce stress, very few studies have been done examining the effectiveness of Mindfulness Based Stress Reduction (MBSR) for teachers. MBSR is an individual-focused intervention that builds social-emotional competency, which should in theory work to reduce teacher stress.

Glenmoore High is currently employing a few mindfulness programs in an effort to combat stress. These programs have resulted from a grant from teacher-led initiatives with district support. These programs are offered as additional professional development classes that meet once a week for eight weeks. Many teachers at Glenmoore are still resistant to these programs, questioning the legitimacy of what they are offering. While the school has made an effort to make these classes available to teachers, it has not offered the data as to why such a program would be beneficial for teachers. There have been no comprehensive studies to measure the effectiveness of such an intervention on teachers in such an environment. The lack of data surrounding mindfulness at Glenmoore is currently an obstacle to its successful implementation. This study chose to examine MBSR because MBSR is the original mindfulness stress intervention created by the originator of the modern mindfulness movement, Jon Kabat-Zinn. It is the foundational program on which most modern mindfulness exercises are based (Kabat-Zinn, 2011). Therefore, data gathered from this study will also provide insight into other mindfulness programs at Glenmoore. While there have been many studies on the effectiveness of

MBSR, many of the studies are poorly performed, context-specific, and motivated by extreme bias (Khouri et al., 2015). This study will generate context-specific data to Glenmoore, and hopefully provide guidance as to whether the school should incorporate more or fewer mindfulness-based interventions in the future.

1.3 Theoretical Framework

The theoretical framework for this study is the theory of enhanced self-regulation. According to the theory of enhanced self-regulation, mindfulness meditation consists of four distinct and interrelated parts: attention regulation, body awareness, emotional regulation, and the change in the perspective on the self (Holzel et al., 2011). This theory outlines how each of these components interweave and are responsible for specific physical changes in the brain. These changes then are associated with physical and mental changes in the body. Enhanced regulation theory is the first comprehensive theory that explains why mindfulness practice works to reduce stress. This study will examine if a mindfulness-based intervention reduces stress in teachers. Enhanced regulation theory is the foundation that explains why such an intervention would theoretically work.

1.4 Purpose of Study

The purpose of this study is to explore the effectiveness of a MBSR intervention for teachers at Glenmoore High. This study seeks to understand if this mindfulness intervention is an effective tool for our teachers. The goal of the study is to generate local knowledge that can be used to help teachers at Glenmoore in the future.

1.5 Research Question

The research questions of this study are:

1. What effects does a self-guided, audio-based, Mindfulness Based Stress Reduction (MBSR) intervention have on teachers in a large public high school?
2. How sustainable is the MBSR program and what factors affect program completion?

The first research question simply seeks to explore the effects of a self-guided audio-based MBSR intervention in our local environment. It is addressed through a combination of qualitative and quantitative data. These data provide answers as to how effective MBSR is for our high school teachers (if it indeed proves to be effective at all), and also what impact the process had on the teachers.

The second research question examines the sustainability of this particular intervention for full-time teachers. It is answered through participation data and interviews. These sources of data will provide nuanced information about the challenges and successes of the intervention, and pave an understanding for future recommendations.

1.6 Positionality of the Researcher

I am a teacher at Glenmoore High, where this study will take place. I have taught there for seven years and have become quite familiar with the students and staff. I am also quite familiar with the culture of the school. Firstly, because of my work as a teacher at this school for many years, and secondly because I attended this school for high school when I was a student. I am in the unique position of experiencing the school as both a student and as a teacher. This aligns me as a researcher who studies their own practice

and setting, which is a number one on Herr & Anderson's continuum of positionality (Herr & Anderson, 2015). I will be the primary researcher in this study.

Despite my insider status, schools are ever-moving complex environments, and it would be foolish of me to assume that my colleagues are experiencing exactly the same environment as I experience. However, there are still some shared experiences that I and all the other teachers experience. We attend the same tumultuous staff meetings and deal with the same losses in our community. We gripe about the same things in the teacher's lounge and laugh and smile about our successes.

I am biased because of my strong love of the school and the community. Despite the stress that surrounds the school I believe it is the best educational experience in our state. It is the place I would like to work for the rest of my working career. I respect my colleagues. Most of all, I love the students that attend our school. I want nothing more than to see all members of our community lead happy and successful lives, free of stress and problems.

I personally have had issues with stress in my life. I have lost sleep from work and life-related stress. I have had issues with anxiety and maintaining focus on projects or papers. This anxiety has often made completing schoolwork difficult and arduous, and I have experienced decreased productivity and achievement because of my stress.

I have known a large number of fellow teachers over the years who have had problems with stress. Their stress has led to burnout and depression. It has made an already difficult job much more difficult to handle. More than anything else, my colleagues' stress the reason I am conducting this study. I hope to find something that helps us all navigate the difficult and stressful terrain of teaching. The goal of this study

is partially to catalog and describe my own journey and experiences through this process, as well as capturing the experiences and stories of my colleagues.

I am aware that there is a complex relationship between myself and my colleagues. They know me as a fellow teacher. There may also be some stigmatization toward stress and stress management. Some departments have negative associations with mindfulness and others have very positive associations. In order to mitigate these factors as much as possible, all data will be collected anonymously. This way teachers will have the freedom to voice their true feelings without worry of affecting our relationship.

1.7 Research Design

This study is a teacher-as-researcher-and-participant action research study using an explanatory sequential mixed-methods approach. Action research is used by practitioners to deepen their own understanding of problem solving in a way that benefits their day-to-day practice (Herr & Anderson, 2015). My goal is ultimately to use the research to benefit the day-to-day lives of my colleagues and myself, and to better understand how we can effectively manage our stress.

Mixed-methods approaches are most appropriate when the researcher uses both quantitative and qualitative research methods (Efron & Ravid, 2013). This study used a quantitative approach to measure and analyze stress, and then used a qualitative approach to explore the process of the mindfulness intervention.

Quantitative approaches are ideal when measuring specific variables or the effects of a specific intervention (Efron & Ravid, 2013). One aspect of this study assesses the effect of a Mindfulness Based Stress Reduction intervention (the independent variable) on teacher stress levels (the dependent variable), which was measured by the most

commonly used measure of stress and anxiety, the State-Trait Anxiety Index (STAI). The participants who had the greatest change, the least change, and the average change were selected for the qualitative interviews.

Qualitative approaches often try to describe the meaning of an experience for a group of individuals (Efron & Ravid, 2013). The goal of the participation logs and the interviews was to capture the meaning of this mindfulness experience and to explore and analyze it in a nuanced manner.

This study used two treatment groups: a control and an experimental group. The use of a control group will allow the study to more accurately determine if the intervention had a significant impact on the teachers at Glenmoore. In addition to the pretest and posttest, the experimental group also submitted a participation log that tracked their completion of the program. This fidelity data was used to help answer the research question about feasibility.

The study took place at Glenmoore High. Glenmoore High is a high achieving public high school that is ranked as one of the top schools in the state. It offers both AP and IB courses, as well as advanced and college-preparatory classes. The school is 72% white, 11% Hispanic, 9% Asian, 6% Multi-ethnic, 1% black and <1% other. 11% of the students are in free and/or reduced lunch programs. The people who participated in this study are any teachers who chose to opt-in to the study Glenmoore High. Any teacher who wanted to participate was welcome.

1.8 Data Collection and Analysis

This study used three main methods of data collection. Data was collected through a pretest and posttest, a participation log, and interviews. Firstly, data was

collected using the State-Trait Anxiety Index (STAI) as a pretest before the intervention and as a posttest after the intervention. Teachers completed this 40-question Likert-scale survey with paper and pencil.

The data collected from the STAI was analyzed with paired Student's t-tests and unpaired Student's t-tests to determine if the intervention had a significant impact on teacher stress levels. A paired t-test is the most effective way to see if a treatment had a significant effect on a population (Fralick, Zheng, Wang, Tu, & Feng, 2017). This determined if each treatment group had a significant reduction or increase in stress. The unpaired t-test compared the experimental treatment group to the control group. This determined if the MBSR intervention made a significant difference compared to the control. The STAI will generate numerical data which will be effectively and cleanly analyzed using these t-tests.

The fidelity score from the participation logs was compared to the net change from the STAI score for individuals from the experimental group. Regression analysis was used to determine if there was a significant correlation between fidelity score and net change in STAI score. This provided valuable information about the importance of the completion of the full MBSR intervention.

The interviews were recorded, transcribed and coded, and then common themes were analyzed and reported. The participation logs were also analyzed and reported. Triangulation, member checks, and maximum variation were used to help ensure the reliability and validity of the data (Merriam & Tisdell, 2016).

1.9 Significance of Study

While there have been many studies on mindfulness interventions, this is one of just a few studies that has ever been completed on self-guided audio interventions for teachers. In addition, this is an action research study intended to generate local knowledge. Action research has a few limitations associated with it that are not present in tradition education research. In action research "[Educators] are not concerned whether the knowledge gained through their studies is applicable and replicable in other settings. Their goal is to improve *their* practice and foster *their* professional growth by understanding *their* students, solving problems, or developing new skills" (Efron & Ravid, 2013, p. 4). Often, the goal of action research is simply to help the teacher or students who are a part of the study. This is exactly what I was attempting to do with this action research study. My goal was simply to figure out if MBSR is an effective way to help myself and my fellow teachers deal with stress. This study was not intended to generate knowledge that is easily generalizable or applicable to other settings.

1.10 Limitations of Study

This study was completed under a limited time-frame of eight weeks. Because of this, the scope of data collection was slightly limited. My position as an insider may have also introduced unintended bias into my perception of the study. I tried to mitigate this through a variety of reliability and validity ensuring measures.

Another limitation of the study is that it is difficult to prove a causal link between the stress intervention and the reduction of stress. The STAI showed a correlation between the intervention and STAI scores, but it did not prove that the intervention

caused the change in these scores. The interviews suggested causation, but it is not enough to definitively prove a causal link.

In addition, stress is a nebulous term that is hard to pin down precisely. This makes it hard to gather truly objective data. While I have provided a specific definition for the purposes of this dissertation, each individual has their own interpretation of the word and surrounding concepts. This makes the discussion about stress subjective and shaped by the experience and lens of the person discussing it. Therefore, measures of stress, whether the STAI or interviews, will all have subjective elements entangled with their seemingly objective components. Measuring stress will always be more complicated than counting chickens, and so the results of this study should be understood through that subjective lens.

Other measures of teacher stress and burnout were also considered, such as the Teacher Stress Inventory and the Maslach Burnout Inventory, but were not included in this study. This is because the STAI is a more widely used instrument of stress measuring (Julian, 2011), and I wanted to avoid overwhelming my participants with surveys. I was concerned that participation rate might drop if I increased the requirements for participation. In future studies, I may consider using these measures in addition to the STAI in order to gather more data.

Also, COVID-19 and the unique stressors that Glenmoore faced drastically changed the school year. This made the circumstances of this study unique and made the results even harder to generalize to other situations.

1.11 Organization of the Dissertation

Chapter 2 is a literature review that defines and explores stress and mindfulness, examines the background literature, and explains the theoretical framework of the study. Chapter 3 is the methodology, which explains the study design and methods and rationale for data collection and data analysis. Chapter 4 includes all of the results of the study, as well as an analysis of those results. Lastly, Chapter 5 places those results in context of previous literature, makes recommendations for practice and future research, and explores the limitations of the study.

1.12 List of Definitions

The State-Trait Anxiety Inventory for Adults (STAI-AD), by Charles D. Spielberger
From Mindgarden, 2022 the publisher of the STAI:

The State-Trait Anxiety Inventory for Adults™ (STAI-AD) is the definitive instrument for measuring anxiety in adults. It clearly differentiates between the temporary condition of "state anxiety" and the more general and long-standing quality of "trait anxiety." It helps professionals distinguish between a client's feelings of anxiety and depression. The inventory's simplicity makes it ideal for evaluating individuals with lower educational backgrounds. Adapted in more than forty languages, the STAI is the leading measure of personal anxiety worldwide.

The STAI has forty questions with a range of four possible responses to each.

The current version of the STAI is form Y, which includes 40 Likert-scale questions. Participants self-report, and higher scores are correlated with greater levels of anxiety (Tilton, 2008).

Mindfulness – The nonjudgmental attention to experiences in the present moment

(Kabat-Zinn, 2013)

Mindfulness Based Stress Reduction – The original eight-week mindfulness program

used by Jon Kabat-Zinn at the University of Massachusetts.

Social-Emotional Competency – How people apply knowledge, skills and attitudes to

understand and manage emotions, feel and show empathy, establish and maintain positive

relationships, set and achieve positive goals, and make responsible decisions (CASEL,

n.d.)

Stress – The subject experience of distress experienced by the person as a result of a

stimulus, known as the ‘stressor’. In this study ‘stress’ and ‘anxiety’ will also be used as

interchangeable terms.

CHAPTER 2

LITERATURE REVIEW

2.1 Statement of the problem of practice

All teachers experience an enormous amount of stress (Gallop, 2014; Smith et al., 2004). In addition to usual occupational stress, the teachers at Glenmoore are facing unique challenges. This year, the longstanding principal was removed because of a Title IX investigation. Students have died in accidents and in mass shootings. Teachers and administrators have transferred or quit and further allegations of assault and harassment have been filed. All of these elements – poor relationships with administration, high amounts of turnover, student deaths, assault and trauma – have been shown to increase teacher stress (Beteille, Kalogrides, & Loeb, 2011; Johnson, Kraft, & Papay, 2012; Kapadia, Coca, & Easton, 2007; Kyriacou, 2001).

Teacher stress has negative impacts for the teachers themselves, the students in their classroom, and for the school district. For the teachers themselves, stress leads to exhaustion, chronic illness, increased cortisol levels, and a lower quality of life (Katz et al., 2016; McNeely, C., & Blanchard, J., 2009; Salleh, 2008; Schneiderman et al., 2005). Teacher stress also affects the students in their classrooms. Stressed teachers create less effective classroom environments that are not beneficial for student learning (Greenberg et al., 2016). This results in lower academic achievement and poorer social-emotional outcomes for students (Hoglund, Klinge, & Hosan, 2015). Lastly, stressed teachers are more likely to experience burnout and leave the profession (Raue & Gray, 2015). This

turnover and the associated training of new teachers cost school districts an enormous amount of money (National Commission on Teaching and America's Future, 2007).

One possible way to reduce teacher stress is with individually based interventions that increase the social-emotional competency of teachers (Greenberg et al., 2016; Roeser, 2014). Mindfulness Based Stress Reduction (MBSR) is an individually based intervention that increases social-emotional competency and has been shown to reduce stress (Kabat-Zinn, 1992; Zarate, Maggin & Passmore, 2019). While there have been a number of studies examining the effectiveness of MBSR on teachers, many of these studies are context specific, poorly performed, and motivated by extreme bias. There is a need in the literature base for additional studies with control groups and fidelity tracking of participants. This study aims to help fill this gap and to generate local knowledge that can be used to help Glenmoore decide whether or not more mindfulness interventions should be employed in the school in the future.

2.2 Research Question

This study seeks to answer two research questions:

1. What effects does a self-guided, audio-based, Mindfulness Based Stress Reduction (MBSR) intervention have on teachers in a large public high school?
2. How sustainable is the MBSR program and what factors affect program completion?

These questions hope to explore the impact of this Mindfulness-Based Stress Reduction intervention, capture the experiences of the participants, and determine if it is good for other teachers and schools in the future.

2.3 Purpose of the study

The purpose of the study is to investigate the effectiveness of MBSR at reducing teacher stress. Currently, Glenmoore is expanding the role of mindfulness in the school, yet no comprehensive studies have been done to measure its efficacy for our teachers. While there is a large amount of mindfulness research out there, many of the studies are poorly performed, context specific to other groups and locations, and radically motivated by bias (Khouri et al., 2015). This is also one of the first studies to examine self-guided audio interventions on secondary school teachers. The goal of this study is to generate data about MBSR that is context specific to Glenmoore High. This local knowledge will inform the decisions about future interventions aimed at reducing teacher stress. Glenmoore needs an effective tool to help reduce teacher stress. This study should help Glenmoore in that search.

2.4 Organization of the chapter

After the introduction and purpose of the literature review, stress will be examined. The examination will begin with a definition, then move onto the prevalence and causes of student stress. From there the health consequences of stress will be explored, and finally the social justice aspects of stress and the inequitable distribution of stress will be investigated.

Next, focus is turned to mindfulness and MBSR. This section of the literature review will begin with a definition of terms before moving into a history and religious and secular perspectives. Then, the history and purpose of MBSR will be examined, before looking at its track record of efficacy among different groups. Lastly, the common pitfalls and shortcomings of MBSR studies will be examined.

Finally, the theoretical frameworks that underlie MBSR will be explored, so the mechanisms of its function can be fully understood. In short, first the problem (stress) is explored, then the proposed intervention (MBSR) is examined, and finally the theoretical frameworks that underpin the function of MBSR are investigated (how we think it works).

The literature review section will end with a conclusion that will reiterate the current state of knowledge surrounding stress and MBSR, and the need for this particular study at Glenmoore High.

2.5 Purpose of the literature review

The purpose of the literature review section is to gain knowledge about the phenomenon in question. It is to present and summarize the state of knowledge and also argue as to why further original research is necessary to improve this body of knowledge (Machi & McEvoy, 2016). This literature review seeks to display the current state of knowledge surrounding stress and Mindfulness Based Stress Reduction, and to show why this study is necessary to fill a gap in the current body of knowledge. To this end, I have selected a wide variety of literature to review. The stress studies began with the American Psychological Association's annual stress report, which is the most comprehensive look at stress in America. From there, clinical studies examining the effects of stress were studied. The literature review on mindfulness began with *Full Catastrophe Living*, which is the seminal work on MBSR by Jon Kabat-Zinn, the creator of the program. Other works by him were then explored, as well as critiques of the movement and program. As many studies have been published, the efficacy of MBSR was studied by reviewing all of the meta-studies of MBSR on teachers. Common threads were then compared and

analyzed. The Theoretical framework of mindfulness has only been recently explored, and all of the literature suggesting mechanisms was included in this study.

To find literature a variety of search engines were used: ERIC, JSTOR, Academic Search Complete, PubMed, and Dissertations and Theses Global. From these sources the researcher examined peer reviewed journals, books, and dissertations. Websites were also used when further exploring the American Psychological Association and Jon Kabat-Zinn. ERIC was most frequently for the meta-studies on the efficacy of mindfulness. It was selected because of its excellent access to educational studies.

2.6 Stress

This section is organized in the following manner: defining stress, the prevalence and causes of teacher stress, an exploration into the long-term health consequences of stress, and an examination of the social justice aspects of stress.

2.7 Defining stress

One of the tricky issues of researching stress is that there is a lack of specific terminology used. Often the terms ‘stress’, ‘anxiety’ and ‘worry’ are used interchangeably (Putwain, 2007). In addition, it is not always clear whether the term ‘stress’ refers to the stressor itself (such as a break-up or death in the family) or the subjective experience of distress felt by the person in ‘stress’ (Putwain, 2007). Most broadly, stress can simply be defined as how the body and brain respond to a demand (National Institute of Mental Health, 2020). Many things can cause stress, and stress can have a positive or negative effect. In general, small amounts of stress keep people functional in society and large amounts have deleterious effects on physical and mental health (NIMH, 2020). In this research, ‘stress’ will be used to refer to the subject

experience of distress experienced by the person as a result of a stimulus, known as the ‘stressor’. In this study ‘stress’ and ‘anxiety’ will also be used as interchangeable terms.

2.8 Prevalence and causes of teacher stress

Teachers experience more high levels of daily stress than any other working group (Gallop, 2014). Teaching is highly stressful, and this stress often causes teachers to burnout and leave the profession (Ingersoll, 2014; Smith et al., 2004). The main four major sources of stress for teachers are school organization, job demands, work resources, and teachers’ social-emotional competencies (Greenberg et al., 2016).

School organization affects the well-being of teachers. Supportive schools with collaborative environments and strong leadership are associated with higher levels of teacher satisfaction, lower levels of burnout, and lower levels of stress (Johnson et al., 2012; Kapadia et al., 2007). Schools with administrative turnover and poor relationships among staff have greater levels of stress and burnout (Greenberg et al., 2016).

The demands of the job are also a great source of teacher stress. High-stakes testing limits teachers’ autonomy over the curriculum and increases risk of termination (Adnot, M., Dee, T., Katz, V. & Wyckoff, J., 2017; Center on Education Policy, 2016). Difficult interactions with students and parents are a continuous source of stress and make teachers more likely to becoming overwhelmed and depressed (Greenberg et al., 2016).

Workplace resources don’t often empower teachers and give them the sense of autonomy that is associated with lower levels of stress (Verhoeven et al., 2003). If teachers feel like their opinions don’t matter then they are they are less likely to be

satisfied in their job (Greenberg et al., 2016). This sense of lack of control is widespread, as teachers often feel like their voices don't count (Gallop, 2014).

Furthermore, teacher's social emotional competencies greatly affect the amount of stress they experience (Greenberg et al., 2016). When teachers are in highly stressful situations and have poor social-emotional competence, they are more likely to do poorly and leave the profession (Montgomery & Rupp, 2005). However, teachers with higher levels of social-emotional competence are better able to regulate their own emotions and are more likely to positively reinforce student behavior (Li-Grining et al., 2010).

In addition, teachers are stressed due to extraordinary circumstances surrounding COVID-19. Last year, teachers were required to create both virtual and in-person curricula and run hybrid learning environments where they were responsible for both in-person and virtual students. This year, teachers were required to return to work, even if they had pre-existing conditions that made them especially vulnerable to COVID-19. Masks were also a source of stress in the building. Some teachers were stressed from having to wear a mask, and some teachers were stressed because not enough people were wearing masks for them to feel safe. Concerns over health and safety are a major source of stress for adults (American Psychological Association, 2020) and these issues certainly amplified those stressors. Additionally, teachers were still expected for students to achieve well on AP and IB tests, despite being behind from a year of virtual and hybrid learning. Stress over standardized tests also contributes greatly to teacher stress (Greenberg et al., 2016). COVID-19 is also disproportionately affecting people of color, who experience increased stress surrounding getting COVID-19, access to health care and being able to take care of basic needs (American Psychological Association, 2020).

While the teaching staff of Glenmoore is majority White, teachers of color included in the study indeed demonstrated especially high levels of stress.

2.9 Long-term health consequences of stress

Stress has a large number of long-term health consequences associated with it. Teachers with stress experience poor sleep, exhaustion, lower quality of life and poorer teacher teaching performance (de Souza, de Souza, Belisio, de Azevedo, 2012). In addition, chronic stress increases cortisol levels which are in turn associated with a large number of negative health outcomes (Katz et al., 2016). Stressors have substantial damaging effects of physical and mental health (Essex et al., 2013; Thoits, 2010). Stress has been linked to increased likelihood of cardiovascular disease, high blood pressure, and weakened immune system responses (McNeely & Blanchard, 2009; Thoits, 2010). Stress is of immediate concern for the health and well-being of teachers (Greenberg et al., 2016).

2.10 Inequitable distribution of stress and social justice

Stress does not affect all individuals equally, with women reporting higher levels of psychological distress than men and having higher rates of mood and anxiety disorders (Thoits, 2010). People with low levels of education or income have the highest rates of morbidity, mortality, psychological distress and mental disorders compared to their higher socioeconomic peers (Elo & Preston, 1996; Kessler, 2013; Lantz, et al. 2005). In total, women, adolescents, black and latinx people have the highest overall rates of physical and mental health problems, which directly correlates with their increased exposure to stressors over the course of their life (Pearlin, 1999; Thoits, 2010). Most troubling, however, is the finding that these differential rates of stressors proliferate over

the course of a lifetime and across generations, permanently widening the health disparities between advantaged and disadvantaged groups (House, et al., 1994; Pearlin, 1999; Thoits, 2010.) Therefore, stress management is also a fight for social justice, with an aim to help close the gap between advantaged and disadvantaged groups. While a stress management intervention may benefit all teachers, it will help disadvantaged teachers to an even greater degree (Thoits, 2010).

2.11 Mindfulness

This section is organized in the following manner: a definition of mindfulness, a history of mindfulness and historical perspectives, a look at Mindfulness Based Stress Reduction, an exploration into the effectiveness of mindfulness, and a review of the relevant meta-analyses and studies in the literature.

2.12 Definition of mindfulness

Mindfulness is a meditation technique that encourages present moment awareness (Ludwig & Kabat-Zinn, 2008). More specifically, it is typically defined as the nonjudgmental attention to experiences in the present moment (Kabat-Zinn, 2013). Mindfulness meditation involves focusing attention to the experience of thoughts, feelings and bodily sensations, and simply observing these experiences as they arise and pass away (Hözel, et al., 2011). Mindfulness practice is simply a way to help develop the skill or state of mindfulness, where one is consciously attending to one's moment-to-moment experience (Brown & Ryan, 2003; Shapiro, Carlson, Astin & Freeman, 2006).

To more explicitly understand the process, Shapiro, et al. (2006) further deconstructed mindfulness into the three main elements: intention, attention, and attitude. Mindfulness is purposefully (intention) paying attention to present experiences (attention)

in a particular nonjudgmental way (attitude). All of these elements occur simultaneously and are interwoven aspects of a single process – called mindfulness (Shapiro, et al., 2006).

Bishop, et al. (2004) also provided a definition for mindfulness, but deconstructed it into two elements instead of three. The first element is the self-regulation of attention so that it is maintained on experience (Bishop, 2004). The second element is the particular attitude of curiosity, openness, and acceptance toward these experiences (Bishop, 2004).

2.13 History of mindfulness and historical perspectives

Siddhartha Gautama was a prince who achieved enlightenment and became known as the Buddha. Buddhism is a broad term that encompasses a diverse range of traditions stemming from the teachings of Buddha (Brown, 2019). While Buddhists have lived in the United States since the 19th century, many more arrived after China's occupation of Tibet and the exile of the Dalai Lama (Brown, 2019). Modern day mindfulness stems from an interpretation of *Buddhadharma*, the teachings of Buddha (Brown, 2019; Kabat-Zinn, 1992; Williams & Kabat-Zinn, 2011). From these religious roots it has been rebranded and reconceptualized as a mostly secular practice, similar to the growth of yoga (Kabat-Zinn, 2011; Brown, 2019). For most Asian Buddhists, meditation was originally a practice performed only by monks, and was a very small piece of Buddhism in general (Brown, 2019). The modern reconceptualization of Buddhism downplays the “superstitious” rituals to supernatural entities and the accumulation of merit for future lives, and vastly centralizes the importance of meditation, which is seen as a quasi-scientific way of experiencing reality directly

(Brown, 2019). Meditation is much more approachable for the agnostic or scientific mainstream, and thus has allowed for this Buddhist tradition to thrive in an increasingly science-driven world.

No man has been as instrumental in mindfulness rebranding as Jon Kabat-Zinn, who created Mindfulness Based Stress Reduction (MBSR) and generally spearheaded the integration of this Buddhist practice into a medical framework (Kabat-Zinn, 1992). However, simple rebranding and using of secular language does not separate the practice from its religious roots.

Brown (2019) points out the inherent duality of the religious and secular in modern mindfulness techniques, noting that “mindfulness is ‘secular’ in the sense of privileging present experience and ‘religious’ in comprising a world view and way of life premised on more-than-physical assumptions about the nature of reality, self, and the path to salvation from suffering.” Thus, it can be concluded that mindfulness practices will never be completely removed from their religious origins, no matter the language used to describe the process and its outcomes.

Therefore, some debate has occurred as to whether or not mindfulness-based practices (MBPs) have a place in schools. Some argue that it is a secular practice and others call it a “trojan horse” sneaking religion back into schools (Brown, 2019). Most likely mindfulness will always live in the gray area between its religious roots and its modern secular applications.

2.14 Mindfulness Based Stress Reduction

Mindfulness-Based Stress Reduction (MBSR) is a mindfulness curriculum and treatment program developed by Kabat-Zinn (Kabat-Zinn, 1992). MBSR was originally

intended to deal with chronic pain, but has since also been used to treat emotional and behavioral disorders (Kabat-Zinn, 1992). MBSR functions as a public health intervention, to be used for both individual and societal transformation (Kabat-Zinn, 2011). In many modern clinical applications, MBSR is a curriculum that is used to reduce pain and suffering in treatment of a variety of conditions.

However, Kabat-Zinn sees MBSR as much more than simply a cognitive-behavioral technique used to change behavior and symptoms. To Kabat-Zinn it is a “way of being and a way of seeing that has profound implications for understanding the nature of our own minds and bodies, and for living life as if it really mattered” (Kabat-Zinn, p.284, 2011). While the specific language used in MBSR intentionally distances it from its Buddhist origins (no mentions of dharma or Buddhism), MBSR was started by Kabat-Zinn to bring his dharma practice to his work life and it still very much contains its dharmic roots and scope of vision (Kabat-Zinn, 2011). When creating it, Kabat-Zinn was careful to recontextualize meditation within the framework of science so that it could be more easily palatable to the medical community, by using already accepted terms such as self-regulation of attention to describe the mechanics of meditation (Kabat-Zinn, 2011). The term “stress reduction” was used because it was simultaneously broad and clinical (Kabat-Zinn, 2011). Kabat-Zinn said he “bent over backwards” to hide the religious roots of mindfulness and to get it accepted into the mainstream (Brown, 2019). Kabat-Zinn sees MBSR as a way of integrating dharma and Buddhist teachings into science and medicine to help people live better lives (Williams & Kabat-Zinn, 2011). There is criticism of MBSR from both sides: Buddhists who fear that it has become too secular and separated from its dharmic roots and scientists and medical professionals who do not

want religious teachings in their stress interventions (Williams & Kabat-Zinn, 2011). Interestingly, MBSR is seen as too religious and not religious enough.

In the past two decades, mindfulness research has increased almost exponentially. There are now hundreds of studies performed each year on various applications of mindfulness (Williams & Kabat-Zinn, 2011). MBSR has been retooled for use in MBCT, MBRP, MBCP, MB-EAT, MBEC and many more specific applications. All of these applications have found various degrees of success, and have helped deepen our understanding of the nature of the human mind and body (Kabat-Zinn, 2011).

2.15 Mindfulness Research

Mindfulness-Based Stress Reduction was first shown to be effective as a treatment for stress in a landmark study by the creator of MBSR himself (Kabat-Zinn et. al, 1992). In this study, 22 patients with generalized anxiety disorder were treated with MBSR. The study found that 20 of the patients showed significant reductions in their anxiety and depression measures, and that these decreases were sustain for 3 months after the intervention (Kabat-Zinn et. al, 1992). Kabat-Zinn then concluded that MBSR was an effective treatment for stress or anxiety.

This study possessed a few significant limitations. First, there was no control or comparison group to which the treatment group was compared. Kabat-Zinn simply measured the decrease in study participants and called it significant. Also, MBSR was not compared against any other kind of cognitive-behavioral interventions. In addition, the especially small sample size called into question the significance of the results. Even Kabat-Zinn (1992) himself states the results “could have been an artifact of the small size of the study group.” Finally, we must mention the overwhelming bias of the researcher.

MBSR is something created by Kabat-Zinn and sold and advertised through his best-selling book *Full Catastrophe Living*. Therefore, Jon Kabat-Zinn has enormous financial and personal incentive to claim that MBSR is effective.

Since the original study by Kabat-Zinn, many different studies examining the effectiveness of mindfulness have been completed. A quick search on PubMed returns 17,486 results. A date-selection search demonstrates an exponential increase in these studies, with 3,652 of the total results originating from papers published in 2019 and 2020 alone. While there are now plenty of studies on mindfulness, many of these studies share the same short-falls of the original study: small sample sizes, lack of controls, and large amounts of researcher bias (Khouri et al., 2015). How then, can one parse through the massive “haystack” of mindfulness research to get an accurate picture of the current state of understanding?

Fortunately, other researchers have also attempted to comb through this vast number of studies in search of a defining answer. Many meta-analyses of mindfulness studies have been completed, and I have reviewed the most relevant ones here and synthesized their findings to create an accurate ‘snapshot’ of our current understanding. In addition, only two studies have ever been conducted that use self-guided audio mindfulness interventions, and both of those studies are discussed here.

2.16 Studies with Self-Guided Audio Mindfulness Interventions

Only two studies have been conducted previously that used a self-guided audio mindfulness intervention on teachers. The first was a doctoral thesis by Laura Bakosh in 2013, and the second was a master’s thesis on phone-based mindfulness interventions by James in 2016.

Bakosh (2013), ran a study on an audio mindfulness intervention for elementary school students and teachers. The study largely examined outcomes for students, with 337 student participants and 16 teacher participants. The mindfulness intervention consisted of ninety different ten-minute mindfulness interventions. The teachers in the treatment group reported greater levels of mindfulness and lower levels of perceived stress as compared to the control group.

James (2016), used a mobile phone-based mindfulness intervention to measure its effects on stress, emotional regulation and life satisfaction. He took thirty-nine secondary school teachers and randomly put them into a mindfulness group and a control group. The intervention lasted ten days. The mindfulness group self-reported decreases in stress, increases in emotional regulation and increases in life satisfaction. The control group did not demonstrate any significant changes in the measured variables.

Neither of these two studies used the Mindfulness Based Stress Reduction intervention originally created by Jon Kabat-Zinn. Both of the studies used audio interventions that lasted about ten minutes a day, and neither of these studies included a yoga component.

2.17 Meta-analysis of previous studies

Khoury et al. (2015) conducted the first landmark meta-analysis on the effects of MBSR on healthy individuals. This is significant as many studies with MBSR as an intervention use participants with clinical diagnoses, such as participants with anxiety disorder or depression. While there may be some students with anxiety in my classroom, there will also be healthy individuals and it is important to see if the research suggests that MBSR will be helpful for those students as well. Khoury et al. (2015) searched

Medline, CINAHL and Alt HealthWatch for studies examining MBSR in healthy adults. Studies were only excluded from the meta-analysis if they did not have quantitative data, did not use healthy individuals, did not measure stress and anxiety, or if they used other stress reduction strategies. A total of 29 studies (with a sum total of 2668 participants) were found that met these criteria and were included in the meta-analysis. After results were analyzed, Khoury et al. (2015) found that MBSR is moderately effective in reducing stress, depression and anxiety in healthy individuals. It was also found to improve quality of life. However, there were some fairly significant limitations with this meta-analysis. There were a small number of included studies and these studies often included a high heterogeneity in their participants, greatly reducing the scope of the conclusions. In addition, only a single study in the entire meta-analysis compared MBSR to an active control group. Finally, the researchers note that most studies contain a high risk of bias, and lacked long-term follow up. The authors suggest further research to pinpoint which parts of MBSR are the most effective, as most of the studies examined cannot differentiate between elements of MBSR and their effects, instead lumping it all together in one “package deal”.

Klingbeil & Renshaw (2018) completed the first meta-analysis on the effects of Mindfulness-Based Interventions on teachers who work in pre-k-12 schools. This meta-analysis is especially significant for this study, as it examines the previous research done in the specific area in which this study will be completed. The authors searched PsycINFO, ERIC, PubMed, Academic Search Complete, and ProQuest Dissertation and Theses in 2018 for mindfulness studies that involved teachers. All studies that used mindfulness-based interventions and teachers were included. Studies were excluded from

the meta-analysis if they were nonintervention studies, single-case designs, purely qualitative, or if they did not have a control group. Ultimately, after screening and inclusion/exclusion criteria, Klingbeil & Renshaw had 29 studies which they used for their meta-analysis. After analysis, the authors concluded that Mindfulness-Based Interventions had a medium and significant overall effect on improving targeted outcomes, suggesting that the intervention is generally effective. The overall improvements they found aligned closely with the previous meta-analyses on healthy adults conducted by Khoury et al., 2015. The meta-analysis also noted that only two studies (Bakosh, 2013 and James, 2016) had ever evaluated the use of self-guided mindfulness programs delivered using audio recordings. Based on these two studies, Klingbeil & Renshaw suggest that untrained school staff without personal mindfulness practice are unlikely to be able to deliver MBI's that support teacher outcomes. In addition, after examining all of the outcomes from previous mindfulness studies and teachers, the authors concluded that there are small-to-medium effects on therapeutic processes and outcomes that are suggested by mindfulness theories. This suggests—at least to a small extent—the mindfulness interventions accomplish what they intend to. Klingbeil & Renshaw also identify several key gaps in the literature and the need for further studies. Most of the studies examined had small sample studies and were highly susceptible to bias. In addition, only five studies have ever included treatment integrity data. This is a critical piece of information and in a necessary component of future research (Klingbeil & Renshaw, 2018). Furthermore, the authors noted that most mindfulness-based interventions varied wildly in terms of length, format and dosage, making it hard to compare the outcomes of one to another. Finally, it was mentioned that

all of the participants in every study were volunteers, and so it is hard to draw conclusions about the mandatory implementation of a mindfulness intervention.

Pascoe, Thompson & Ski (2017) completed a meta-analysis on yoga, MBSR and its effects on physiological measures. This meta-analysis was different from many of the others because it focuses heavily on the physiological side of MBSR. The researchers examined how exactly MBSR affected the body. For this meta-analysis the researchers searched MEDLINE, AMED, CINAHL, PsycINFO, SocINDEX, PubMed and Scopus for studies that involved yoga, MBSR, and physiological measures. To be included in the meta-analysis the studies had to contain Randomized Control Trials (RCTs) published in English, with an intervention of yoga or MBSR, and compared to an active control group. This last criterion was especially important to the researchers as many studies on mindfulness fail to contain an active control, thus seriously calling into question the validity of their results (Pascoe et al., 2017). This meta-analysis included participants of all ages. In total, forty-two studies were selected that met the inclusion criteria. These studies were evaluated with the Cochrane Risk of Bias Tool and then analyzed for results. Pascoe et al. (2017) found that yoga and MBSR reduced levels of cortisol, systolic blood pressure, resting heart rate, fasting blood glucose, cholesterol and low-density lipoprotein compared to control groups. No effects were found on inflammatory measures. Most significantly, these results were greater than the effects of the associated active control, meaning that yoga and MBSR had greater physiological effects than exercise, education, or therapy. The main limitations of this study were a lack of follow-up period and a high risk of bias in the examined studies.

Chi et al. (2018) completed a meta-analysis on the effects of MBSR on depression and young adults. This literature is especially relevant to our study because it looks specifically at the effects of MBSR in adolescents. It also distinguishes itself from other meta-analyses because it focuses on treatment of depression, instead of anxiety or stress. This is important because the claims of MBSR are often sweeping and grand, stating that it can impact almost every facet of physical and mental health (Kabat-Zinn, 2013). This meta-analysis examines the limits of this intervention. Chi et al. searched PubMed, PsycINFO, CINAHL, Web of Science, Embase, ProQuest, Cochrane Library, China National Knowledge Infrastructure and Wangfang Data for key terms Mindfulness Based Stress Reduction, adolescents, and depression. They then narrowed down the search results based on the following criteria: randomized control studies, participants aged 12 – 25 diagnosed with depression, MBSR intervention, and a quantitative measure of depression symptoms. This left them with 18 studies and 2,042 participants for the meta-analysis. After analyzing the results, Chi et al. (2018) found that MBSR had moderate effects reducing symptoms of depression immediately following intervention, but no statistically significant effects on follow-up. This was in part due to the small sample of studies that include follow-up. In addition, the authors note the limitation of few MBSR studies with RCTs, and risk of bias in the studies. Finally, Chi et al. (2018) recommend further studies to determine the relationship between length of treatment and duration of effect.

Breedvelt et al. (2019) completed a meta-analysis on the effects of mindfulness, yoga, and meditation on depression, anxiety, and stress in university students. They searched the Cochrane Central Register of Controlled Trials, PubMed, PsycINFO and

identified 11,936 articles relating to their key terms. These articles were winnowed down to 181 for full text analysis, and finally 23 studies were selected that met all of the researcher's criteria. These criteria included studies that had randomized control trials (RCT), published in English, and an intervention of yoga or mindfulness was compared to a control group. In addition, participants had to be enrolled in a university and some quantitative measure of depression and anxiety for pre/posttest had to be used by the study. Of the 23 studies that were included in the meta-analysis, there were a total of 1,373 participants. After statistical analysis, Breedvelt et al. (2019) concluded that mindfulness, yoga, or meditation-based interventions had significant positive effects on the symptoms of depression, anxiety and stress. Subgroup analysis revealed no difference between yoga, mindfulness and meditation interventions. Breedvelt et al. (2019) also found that mindfulness interventions were more effective than exercise-based interventions or cognitive behavioral therapy-based interventions. Interestingly, they didn't not find a correlation between the number of hours taken for the intervention and the effect it had. This meta-analysis also had some significant limitations to its findings. They found that most of the studies on mindfulness were of low quality with an extremely high risk of bias. In addition, the sample size was also relatively small. Finally, the effects of the intervention were diminished in studies with active controls. Breedvelt et al. (2019) suggest that this means that other items such as peer-support might have driven their results. Because of this, they found it difficult to determine the true value of their findings. In conclusion, Breedvelt et al. (2019) suggest further research. They suggest these future studies on mindfulness be conducted with a greater degree of rigor, and with more attention paid to comparisons between active placebo and control groups.

Published in 2020, Zhou et. al's meta-analysis of MBSR on anxiety symptoms in young adults also provides evidence for the effectiveness of MBSR. Zhou et al. searched PubMed, PsycINFO, Web of Science, EMBASE, CINAHL and the Cochrane Library for any studies with the keywords MBSR (or synonyms), anxiety (or synonyms), and adolescents (or synonyms). Studies were included into the meta-analysis if they had (1) randomized control trials that explored the effects of MBSR, (2) adolescents aged from 12 to 25, (3) the MBSR intervention was designed off of Kabat-Zinn's 1990 MBSR presented in *Full Catastrophe Living*. Studies were excluded if they themselves were meta-analysis or secondary studies, involved other interventions in combination with MBSR, or if no post-intervention anxiety score were reported. 14 total studies met all of the criteria, and thus those studies and their total of 1489 participants were compared in the meta-analysis. All of the studies examined were rated as having a "moderate risk of bias" based on the Cochrane Handbook for Systematic Reviews of Interventions. After sensitivity analysis of the literature to measure the bias and after statistical analysis, Zhou et al. (2020) found that MBSR was significantly superior to control conditions in reducing anxiety symptoms in young people. MBSR was more helpful than treatment as usual or health education. This study also found feasible support for short-term MBSR (< 8 weeks) to help reduce anxiety symptoms. However, due to the small sample size of studies, Zhou et al. recommend future studies examining the effects of MBSR on young people.

2.18 Summary of previous research

A synthesis of all of these recent meta-analyses on MBSR provides an accurate picture of our current understanding of the efficacy of MBSR as well as some common

pitfalls of MBSR studies. MBSR interventions have been found to be effective in healthy people (Chiesa & Serretti, 2009; Khoury et al., 2015), teachers (Klingbeil & Renshaw, 2018), university students (Breedvelt et al., 2019), and adolescents (Chi et al., 2018; Zhou et al., 2020). They have also been found to be effective in the elderly (Li & Bressington 2019) and in the general population (Grossman et al., 2004). MBSR also has a measurable physiological effect on the body, affecting cortisol, lipids, and glucose levels, the heart, heart rate and blood pressure (Pascoe et al., 2017). Overall, MBSR has been found to be effective in the reduction of stress and anxiety (Breedvelt et al. 2019, Khoury et al., 2015; Klingbeil & Renshaw, 2018; Pascoe et al., 2017; Zhou et al. 2020). It has also been found to be more effective than exercise, education, no treatment, or generalized relaxation (Pascoe et al., 2017; Breedvelt et al. 2019; Zhou et al. 2020). In addition, MBSR has been found to be effective in the short-term for the treatment of depression, but there is not currently adequate research to support its long-term effects (Chi et al., 2018). Overall, the literature certainly provides enough evidence to support the use of MBSR as an effective intervention for stress reduction in teachers for this upcoming study.

2.19 Limitations of previous studies and the need for this study

From the review of significant meta-analyses, it can also be concluded that a majority of mindfulness studies have similar, significant limitations. Many mindfulness studies lack a control group entirely, and those that do have a randomized control trial often lack an active control group (Breedvelt et al. 2019; Chi et al., 2018; Khoury et al., 2015; Pascoe et al., 2017). This makes it very difficult to measure the effectiveness of the intervention as compared to a placebo or any number of other unmeasured factors. Many

studies also lack quantitative mindfulness assessment measures and fidelity tracking (Khoury et al., 2015; Klingbeil et al., 2018; Pascoe et al., 2017). This makes it nearly impossible to track the quantity or quality of the MBSR intervention itself. Maybe some participants are getting a genuine mindfulness experience and others are not. Because there is not an explicitly measurable intervention (take 200mg of drug x, for example), the variability of experience can make it difficult to draw conclusions. Many mindfulness studies were also completely qualitative in nature, with a lack of any quantitative data at all (Khoury et al., 2015; Pascoe et al., 2017). This makes it difficult to determine if the results are statistically significant or not. Finally, almost all mindfulness studies are plagued by a small sample size (Breedvelt et al. 2019; Chi et al., 2018; Khoury et al., 2015; Pascoe et al., 2017; Zhou et al. 2020). This is true of the meta-analyses and of the studies examined in the meta-analyses. Small sample sizes dramatically increase the variability of results and make it much more difficult to extrapolate the results in a statistically significant way. Finally, almost all of the mindfulness studies had a high risk of bias (Breedvelt et al. 2019; Chi et al., 2018; Khoury et al., 2015; Pascoe et al., 2017; Zhou et al. 2020). This bias was the result of many factors, including the incentives for the researcher, the selection of participants, and the selection of data.

Overall, most of the meta-analyses called for further research conducted in a more rigorous manner (Breedvelt et al. 2019; Chi et al., 2018; Khoury et al., 2015; Pascoe et al., 2017; Zhou et al. 2020). There is a clear dearth of quantitative MBSR studies with RCTs and active control groups. Even though there is a large amount of data suggesting that a MBSR intervention will be an effective way to help alleviate stress, the data

available is not of high enough quality or specificity to preclude the need for the study. In fact, many of meta-analyses examined call for exactly this type of study (Breedvelt et al. 2019; Zhou et al. 2020).

The current literature base of mindfulness research demonstrates a clear need for this particular study. This study will be the first study ever conducted using the MBSR self-guided audio mindfulness intervention on high school teachers. Additionally, it will be only one of a few studies ever conducted using any form of self-guided audio mindfulness intervention on high school teachers. Therefore, it will greatly expand the existing knowledge base in this particular area. In addition, there is a great call from the literature for more mindfulness studies that include fidelity tracking, which this study has (Hwang, Bartlett, Greben, & Hand 2017; Emerson, Leland, Hudson, Rowse, Hanley & Hugh-Jones, 2017). Finally, this study is unique because it is a mindfulness study which uses a control group and a quantitative approach. There is a severe lack of mindfulness studies with these attributes, and conducting this study in this manner will more effectively add to the total mindfulness knowledge base (Khoury et al., 2015; Pascoe et al., 2017).

2.20 Theoretical Framework

The theoretical framework for this study is the theory of enhanced self-regulation set forth by Holzel et al. (2011). This theory states that “mindfulness mediation comprises a process of enhanced self-regulation that can be differentiated into distinct but interrelated components, namely, attention regulation, body awareness, emotion regulation (reappraisal and extinction) and the change in perspective on the self” (Holzel et al., 2011). One element that sets this theory apart from others is the interconnected

nature of the components. Previous work has looked at individual components of mindfulness in isolation, and not tried to untangle the web of relationships that interplay between them (Holzel et al., 2011). For example, Shapiro et al. (2006), suggest that the main components of mindfulness are attention, intention, and attitude. Their work outlines these three components and the possible mechanisms of action, but often looks at these components in isolation. Brown et al. (2007), also suggest a more complicated approach to mindfulness, instead suggesting five major components: insight, exposure, nonattachment, enhanced mind-body functioning and integrated functioning. Holzel's work expands on these frameworks by examining the interplay of the components. To better understand this theoretical framework, we will look at each element individually, and examine how each element affects the others.

Attention regulation

Controlling attention is an important part of most meditation practices, from Buddhist traditions to Indian yoga traditions (Holzel et al., 2011). Attention regulation is focusing your attention on one particular thing, whether it is the breath or a thought. When the attention wanders, it is simply brought back to the focus of attention. Over time, the practitioner will be able to keep their focus for extended periods of time. While the attention is focused, other negative thoughts and memories are disregarded, as all of the attention is on the object of meditation (Holzel et al., 2011). This concept is known as conflict monitoring. Neuroimaging shows that the anterior cingulate cortex enables executive attention by detecting conflicts during information processing and using the brain to resolve this conflict (van Veen & Carter, 2002). Practicing meditation increases activation of the anterior cingulate cortex, and over time increases its function (Holzel et

al., 2011). As a result, the brain gets better over time at dealing with conflicts and negative lines of thought. This suggests that attention regulation is one of the critical building blocks of mindfulness functioning.

Body awareness

The next important element of enhanced regulation theory is body awareness. Body awareness is simply the ability to notice subtle sensations of the body (Mehling et al., 2009). Most mindfulness practices focus on an internal body sensation, such as the breath or emotions. Most practitioners of mindfulness report that an increase focus on body sensations leads to an increase of body awareness, however, there has never been any empirical evidence to substantiate these claims (Holzel et al., 2011). This is largely because it is almost impossible to measure body awareness in a way that extends empirically beyond simple self-reporting. A number of neuroscience studies have found changes to the insula of the brain during mindfulness practice, an area that is activated during tasks of interoceptive awareness (Craig, 2003). Studies have also shown that the effect on the brain is greater the sensation (Farb et al., 2010). Therefore, it is thought that increased bodily awareness leads to increased bodily sensation, and these increased sensations lead to greater changes in the brain. Structural neuroimaging also has shown that meditators have greater cortical thickness and grey matter concentration, supporting this claim (Holzel et al., 2011). This provides a mechanistic explanation as to why bodily awareness is a key element of change in mindfulness practice.

Emotional regulation

Emotional regulation is the next key element of enhanced regulation theory. Emotional regulation is a large umbrella term, and therefore this element is subdivided

into two key approaches: emotional reappraisal and emotional extinction (Garland et al., 2011). In emotional reappraisal, stressful events are reconstructed by the practitioner as meaningful or beneficial. Mindfulness practice leads to an increase of emotional reappraisal, and these reappraisal events decrease overall stress levels (Garland et al., 2011).

In emotional extinction, negative thoughts are eventually exterminated completely. This is a complex process of conditioning and fear extinction. In mindfulness, people are instructed to meet any unpleasant thoughts and experiences by turning toward them instead of away from them. They then let these thoughts pass through and replace them with positive or pleasant thoughts. This process works in a similar fashion to exposure therapy, where someone is continually exposed to something they are afraid of to reduce the fear and anxiety response (Chambless & Ollendick, 2001). This, paired with the high state of relaxation generally found in meditation decreases sympathetic activity in the brain (Holzel et al., 2011). As the fear response from the stressor gradually decreases, then the pathway of that memory becomes less reinforced. Over time, the brain slowly learns to form a new memory. As evidence anatomical MRI studies of meditation practitioners have found grey matter changes in the hippocampus of the brain, which is responsible for largely for memory formation (Holzel et al., 2008; Luders et al, 2009). If negative thoughts and stressors, and the memories associated with them leave the brain, then overall stress and anxiety levels decrease. These two mechanisms (emotional reappraisal and emotional extinction) explain why the emotional regulation element of enhanced regulation theory contributes to an overall decrease in stress levels.

Change in perspective on the self

The final element of enhanced regulation theory is the change in perspective on the self. In mindfulness one is taught that there is no such thing as the permanent self, instead the self is a product of an ongoing mental process (Holzel et al., 2011). This mental self is the one that is inhabiting the body, experiencing emotions and controlling actions. This meta-awareness allows for the detachment of the person from the static sense of self, and instead a growing identification with the phenomenon of “experiencing” itself (Holzel et al., 2011). In Buddhist teachings, identification with the static self is a form of stress, and dis-identification with this self leads to a happier, less stressful existence. This change in perspective of the self is supported by neuroscientific findings. Neuroimaging shows that brain structures responsible for self-referential processing such as the medial prefrontal cortex, the posterior cingulate cortex and the inferior parietal lobule are all structurally impacted by mindfulness meditation (Northoff et al., 2006). Studies have also shown increased grey matter in the posterior cingulate cortex, the hippocampus and the temporo-parietal junction (Holzel et al., 2011). Interestingly, this change in perspective of self is described precisely in Buddhist literature but, the underlying neuroscientific mechanisms that spark this growth and change are still to be determined (Holzel et al., 2011). In summary, changing how you think about yourself activates certain parts of your brain and stimulates growth in those areas. This leads to physiological changes in the brain and ultimately changes in the person.

Enhanced regulation theory shows how specific elements of the mindfulness practice makes specific physical changes in the brain. These changes are then responsible

for the mental and physical effects of mindfulness, from stress reduction to decreased blood pressure. Enhanced regulation theory explains for the first time in a comprehensive manner, why mindfulness is an effective intervention. This study will use the groundwork laid by this theoretical framework to help inform the way in which the MBSR intervention will be applied, with special attention taken to each of the four key elements of attention regulation, body awareness, emotion regulation (reappraisal and extinction) and the change in perspective on the self.

2.21 Conclusion

First, the literature review examined student stress by defining stress and examining prevalence and causes, as well as reviewing the long-term health consequences and social justice aspects associated with student stress. Next, the history of mindfulness and MBSR were explored. This was accomplished through an analysis of many different readings, including the groundbreaking seminal work *Full Catastrophe Living* by Jon Kabat-Zinn. Religious and secular perspectives on mindfulness were also considered. Next, the effectiveness of MBSR was analyzed through careful analysis of the original study by Kabat-Zinn and the most important meta-analyses completed in the last few years. Thousands of different studies were assessed by these meta-analyses, and they allowed us to synthesize an accurate picture of the current effectiveness of MBSR, as well as the common limitations of MBSR studies. Finally, the theoretical framework of MBSR, enhanced regulation theory, was explored using Holzer et al.'s (2011) seminal work about the framework. Enhanced regulation theory explains the mechanisms of MBSR and explains why it is an effective intervention.

In summary, the review of literature demonstrates the seriousness of the problem of teacher stress, explores the history and creation of MBSR, provides evidence that the MBSR intervention will be effective, and demonstrates a need to expand the literature on mindfulness research with this particular study at Glenmoore high.

CHAPTER 3

METHODOLOGY

3.1 Introduction

For this study, I selected teacher-as-researcher-and-participant action research using a mixed-methods approach with explanatory sequential design. Action research was better aligned with this study than traditional education research because I conducted the study in my own school for the benefit of my colleagues, my community and myself. The mixed-methods approach was best suited to my research question and my philosophical approach.

3.2 Action Research

An action research approach was best for this study because it capitalized on my insider knowledge of the Glenmoore community, and directly benefited the unique community I serve. While traditional educational research is done by external researchers, “action research is inquiry that is done *by* or *with* insiders to an organization or community, but never *to* or *on* them. It is a reflective process, but is different from isolated spontaneous reflection in that it is deliberately and systematically undertaken, and generally requires that some form of evidence be presented to support assertions” (Herr & Anderson, 2015, p. 3-4). While research practitioners lose the objectivity of an unbiased outsider, they can better use their local expertise and knowledge of the school to help guide the study. My local knowledge and expertise of the school help guided this study. In addition, the results of the study were directly and uniquely applicable to the

community I serve. Glenmoore is a particularly stressful environment, and stress mitigation is of the upmost importance for my colleagues and for myself.

Traditional education research is typically conducted in an external environment, such as a classroom that the researcher is visiting, whereas action research is conducted in the environment the researcher calls home. One of the problems with traditional education research is the gap between the researcher and the classroom. As Efron and Ravid (2013) pointed out, in traditional education research, "the teachers and other school practitioners are seen as recipients and consumers of knowledge produced by outside experts; their role is to effectively implement the research findings in their schools and classrooms. Thus, according to traditional educational research, there is a separation between theory and action and between research and practice (Mertler, 2012, p. 3). Action research helps to close that gap between research and practice, as the research is done in the school by the people who understand it best. My research was carried out directly in my school, with my colleagues, making action research a better fit than traditional education research.

Because I was a researcher in my own school, doing research for the benefit of myself and my colleagues, action research was the perfect choice for this study. Action research allowed my study to be meaningful for my particular community. The results of this study were a directly applicable learning tool for myself and for my colleagues.

3.3 Mixed-Methods Approach

I employed a mixed-method explanatory sequential design. The study began with a quantitative component, and then expanded upon that component with qualitative elements. In explanatory sequential design, the results of the quantitative element are

connected to and explained by the qualitative element (Creswell & Clark, 2018). In this case, the quantitative pretest and posttest helped select candidates for interviews, and those interviews better explained and described the process and impacts of the mindfulness intervention.

The quantitative part of my mixed-method design used a quasi-experimental research approach. Quantitative studies are ideal for gathering numerical data and exploring cause-and-effect relationships in a controlled environment (Efron & Ravid, 2013). I gathered numerical data on teachers' stress levels from the State Trait Anxiety Index (STAI), a well-established standardized measure of anxiety and stress. The cause-and-effect relationship I explored is the effect of a MBSR intervention on teachers' stress levels. Ideally, quantitative quasi-experimental research is designed to test the effect of a planned intervention (the independent variable) on an outcome measure (the dependent variable) (Efron & Ravid, 2013). This is precisely what this part of my study sought to do. The independent variable for this study was the application of the treatment, specifically the presence or absence of the MBSR intervention, and the dependent variable was the STAI score (both S and T), which measures anxiety and stress levels. In this way, I was able to measure against a control whether or not a MBSR intervention affects stress levels. Quantitative research is preferred whenever the researcher seeks to understand relationships between variables or determine if there is a change between a control group and an experimental group (Creswell & Clark, 2018). As this part of my study sought to understand relationships between variables and used a control group to ensure the reliability and validity of my results, quantitative research was clearly the best fit for this element.

The qualitative part of my mixed-method approach was a combination of carefully selected interviews and participation logs from members of my experimental group. The interview participants were selected purposefully, in order to capture as best as possible, the scope of participant experience. The person with the most positive change on the STAI, the person with the least change on the STAI, and a person with the average change on the STAI were all selected for interviews. This strategy for promoting maximum variation helps ensure the validity and reliability of the results (Merriam & Tisdell, 2016). The participation logs also collected qualitative information about participation fidelity. This helped me to determine to what extent each participant completed the mindfulness exercises.

Together, the quantitative and qualitative data elements provided the information required to answer my research questions. A quantitative approach alone would not be able to capture the nuances of the intervention experience, and a purely qualitative approach would lack the analysis of the STAI pretest and posttest. Therefore, in order to ensure the best and most reliable data, this study employed a mixed-methods approach.

3.4 Context of the study and demographics

This study took place at Glenmoore High School (pseudonym). Glenmoore is a public high school with 2100 students. The school is 72% White, 11% Asian, 10% Latino, and 7% Multi-ethnic. 11% of the school qualifies for free or reduced lunch. Last year the school had over 1000 students take at least one advanced level course. The median home price in the district is \$895,000.

The teachers taking part in the study were all teachers from Glenmoore High School. The teaching staff of Glenmoore is comprised of 120 faculty members who are

93% White, 5% Multi-ethnic and 2% Latino. 79 of the teachers have masters' degrees and 7 have doctoral degrees. The average teacher at Glenmoore has 14 years of experience.

Glenmoore experienced a uniquely stressful year. Like many other schools, Glenmoore returned to in-person learning after a year of hybrid and online learning due to the COVID-19 pandemic. This year, the school had an enforced mask mandate for both students and staff. In addition to the mask mandate, there was a strict policy for both students and staff to stay home when they experienced symptoms of sickness. The transition back to in-person learning was stressful for a number of reasons. First, students and staff had to adjust to a new daily routine that required more time and energy than the virtual school environment. Second, many students did not learn as effectively in their previous year of school. As a result, they were behind on their expected content knowledge and student skills, which made the current school year more difficult for both students and staff. Students were more stressed out about their learning, and teachers were more stressed out about reaching yearly content and curriculum objectives.

In addition, Glenmoore also experienced a unique time of turnover. On the first day of school the principal was removed from his position due to a pending lawsuit and Title IX investigation. Since then, three other teachers have resigned, two teachers have been placed on administrative leave, and one teacher and one administrator have been transferred to other schools in the district. Basic informative meetings were frequently interrupted by pointed questions and concerns raised by staff members. One meeting in the first month ended in a shouting match, walk-outs, and tears. There were meetings about trauma and sexual assault on a regular basis. These meetings both addressed

concerns of teachers and students and ignited new feelings of stress. It was truly a tumultuous time at Glenmoore.

This study was completed in part to help determine if MBSR is a helpful tool for teachers navigating this stressful environment. Teachers from all over the school were invited to participate in the study. I met with both the experimental and the control groups in the school library. It is a well-lit open space that easily facilitates meetings and discussions. It is one of the most popular spaces for teachers to meet.

3.5 Role of the researcher

My role as a researcher is that of an insider. I am a teacher at Glenmoore and an alumnus of the school. I used my understanding of the school to help understand the context in which the teachers are approaching the MBSR intervention. I worked alone, as there are no other explicit researchers in this study.

I was also a participant in the experimental group of the study. I was participating to better understand the complexities of the intervention experience, and to reduce stress in my own life. By participating, I got to see first-hand the effects of the intervention, and I used my knowledge of the process to better interpret the results of the interviews.

My goal was not to conduct traditional educational research where the researcher is neutral and removed from the process (Efron & Ravid, 2013). I was trying to conduct action research, where I was an active part of the process and research. I was trying to capitalize on my local knowledge of the environment to tell a more detailed story about this particular study in this particular place. Ultimately, I hoped to paint an accurate picture of this process for my colleagues and for myself, and use that knowledge for the benefit of my school and my community.

3.6 Participants and permissions

There were two main groups of participants in this study: the experimental group (teachers receiving the MBSR intervention) and the control group (teachers who do not receive the intervention). The teachers were selected on an opt-in volunteer basis. Any teacher who wanted to participate in the study was welcome to participate. This ensured the largest possible sample size. It was not necessary to ensure that teachers are experiencing stress in order for them to participate, as the STAI is able to measure any starting level of stress for all participants. Before the study began, it first received approval from the Institutional Review Board, from the local school district and from the building principal. Information about the study was distributed to teachers, staff, and administrators. They were informed about all aspects of the study, including specific time requirements and what explicitly they could expect to encounter during the study. Once informed, in order for teachers to participate in the study, they first had to turn in a signed informed consent form taken from the University of South Carolina IRB website and modified to fit this study. In this way, the research was conducted in a completely transparent manner with multiple levels of institutional approval and informed and willing participants.

The number of teachers who participated in the research was determined by the number of teachers who opted-in. The goal was to include as many teachers as possible. In total, 41 teachers participated in the study. This is a large sample size for the school, which has a total faculty of 120. This means that a third of the faculty participated in the study, which helped ensure reliability of the results. Once they were approved participants for the study, teachers chose whether to be a part of the experimental group

or the control group. While attrition of participants from this study was not planned, one teacher in the experimental group was unable to complete the study because they took a leave of absence from the school.

3.7 Data Collection Measures, Instruments and Tools

One of the main tools for data collection in this study was the State Trait Anxiety Index (STAI). The STAI is a 40-question self-assessment device used in clinical and research settings to determine the anxiety and stress level of a participant. The original STAI was developed by psychologists Spielberger, Gorsuch, and Lushene to measure both state anxiety (anxiety about an event) and trait anxiety (anxiety as a personal characteristic) (Heeren, Bernstein, & McNally, 2018). The test also differentiates anxiety from depression. The 40 questions use a Likert scale, which allows for a quantitative determination of anxiety level. The STAI is intended for ages 16 and up, and so will be an appropriate tool to use to determine teachers' levels of stress. The teachers completed the STAI before the MBSR intervention, and then took the STAI after the intervention was completed.

Permissions to use the STAI were granted by purchasing a license for its use from its publisher, Mind Garden. Once paid, the site electronically granted permissions to provide the STAI survey.

The STAI pretest and posttest were completed by teachers on paper copies. The hard-copy format was easier for the teachers, as electronic surveys tend to get lost in emails. The surveys were kept in a file in a locked room to ensure security.

In addition to the STAI pretest and posttest, participants in the experimental group completed a participation log. This is a schedule of the mindfulness exercises, with a

space for the participants to indicate if they completed the exercise for that day. The participation log tracked fidelity of the process. It was be completed by teachers either electronically or on paper, whichever method the participant preferred. By choosing whichever method suited them best, the participants were likely to develop a routine that allowed them to continuously fill out the participation log.

In addition, interviews with key participants were a key source of data. The interviews follow a semi-structured approach, with a list of questions and prompts to help guide the process. The interview protocol is included in appendix E. The interviews were all recorded and transcribed.

3.8 Data Analysis Methods

The data from the STAI pretest and posttest was analyzed by comparing means using a paired t-test. The paired t-test was used to compare the means of two groups with matched pairs. It is most appropriate to use when comparing a group before a treatment and after that treatment (Fralick et al., 2017). In this case, the test compared teacher's STAI scores before the MBSR intervention and after the intervention. It was also used to compare the pretest and posttest scores of the control group. These analyses used a statistically significant p-value of 0.05, the commonly accepted value of statistical significance in research (Strode, 2019). The t-tests helped ensure both the reliability and the validity of the study. These particular t-tests allowed me to determine if there was a significant difference between the pretest and posttest scores for the control group and for the experimental group. This gave insight as to whether each group experienced a change in stress from the start of the study to the end of it.

Furthermore, unpaired Student's t-tests were used to compare the pretest scores of the control group to the pretest scores of the treatment group. This test determined if there was a significant difference between the scores of the treatment group and the control group. This determined if the MBSR treatment had a significant difference on stress levels when compared to a control, and helped determine if the two groups started from and equal baseline.

The participation log generated fidelity data for each member of the experimental group. There are forty-eight total days of practice on the participation log. For each day the participant completed the required mindfulness activity, they received a score of 1. For each day they did some, but not all of the mindfulness activity, or an alternative mindfulness activity, they received a score of .5, and each day they did not complete the activity they received a score of 0. Then all of the scores for all forty-eight days were summed together and divided by 48. Thus, the participation log generated a numerical percent completion fidelity score for each participant ranging from 0 (no completion) to 1 (full completion). The fidelity score was then analyzed against the change in STAI scores for each member of the experimental group using an R-squared regression analysis. This provided information as to whether or not there was a significant correlation between participation fidelity and change in STAI score.

The interviews followed an interview protocol, which is included in appendix E. The interviews all followed a semi-structured approach, with a list of questions to ask, but also prompts to elicit more robust answers. The interviews were all recorded and transcribed. After transcription, the interviews were examined for common themes and

coded. These themes and the codes associated with them were reported in tables and analyzed.

3.9 Reliability and Validity

The STAI is a well-established measure of stress and anxiety that has been used in medical and clinical research since its development in 1970 (Julian, 2011; Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). It is the among the most widely used measures of stress and anxiety in the world (Julian, 2011). As such, it has well-established measures of reliability and validity.

The STAI is reliable, meaning that it is a consistent tool across researchers, participants and settings. The reliability of the STAI has been well documented through test-retest reliability coefficients and Chronbach's alpha measures of internal consistency. The Test-Retest coefficients for the STAI range from 0.31 to 0.86 (Spielberger, 1989). These coefficients are considerably higher for Trait anxiety than for State anxiety, as state anxiety is dependent on recent events and is therefore likely to change considerably between test and retest, which also lends evidence to the validity of the measure (Julian, 2011). In addition to the highly-significant test-retest coefficients of the initial study, more recent studies have also found test-retest coefficients to be highly significant (Quek et al., 2004; Spielberger, 1989). In addition to the test-retest coefficients, the Chronbach's alpha measures also demonstrate good reliability for the STAI. Chronbach's alpha is a measure of internal consistency, and is often used as a measure of scale reliability. The higher the alpha, the more reliable the scale is. The STAI uses a Likert scale, and has high internal consistency with Chronbach's alpha coefficients ranging from 0.86 to 0.95, depending on the group being tested (Spielberger et al., 1983). Acceptable

alpha measures generally range from 0.7 to 0.8, and anything above 0.8 is considered good, while scores above 0.9 are considered excellent (George & Mallery, 2003).

Therefore, the STAI has consistently proven to be an acceptably reliable measure of stress (Julian, 2011; Metzger, 1976; Quek et al., 2004; Spielberger et al., 1983; Spielberger, 1989; Vitasari et al, 2011).

The STAI is also a valid measure of stress, meaning that it accurately measures what it intends to measure. The validity of the STAI is confirmed through its massive initial testing pool (10,000 adults), its construct and concurrent validity, and its alignment and associations with other well-known measures of anxiety (Julian 2011; Spielberger, 1989). It correlates with the Taylor Manifest Anxiety Scale (0.73) and the Cattell and Scheier's Anxiety Scale (0.85), as many of the questionnaire items were selected from these measures of anxiety (Spielberger et al., 1983). This means that the STAI was developed partially from other measures of anxiety which were previously well-established themselves as valid measures (Julian, 2011). The STAI is not a perfect test, and does show some weaknesses in differentiating anxiety and depression, especially when used on elderly patients or patients with anxiety disorders (Spielberger et al., 1983). However, it is well documented in the literature that the STAI has been consistently found to be a statistically significantly valid measure of stress and anxiety (Julian, 2011; Quek et al., 2004; Spielberger et al., 1983; Spielberger, 1989; Vitasari et al, 2011). For all of these reasons, the STAI is both a reliable and valid way to measure stress in high school teachers.

The fidelity scores were analyzed with R-squared regression analysis. The degree of correlation, or the effect that fidelity has on STAI outcome, will be determined by the

R-squared value. If the R-squared values is less than 0.3, it will be considered to have no effect or a very weak effect, if it is between 0.3 and 0.5 it will be considered to have a weak effect, if it is between 0.5 and 0.7 it will be considered to have a moderate effect, and if the R-squared values is greater than 0.7 it will be considered to have a strong effect (Moore, Notz, & Flinger, 2013).

The reliability and validity of the qualitative data were ensured through member-checking, triangulation, and maximum variation. Member checking insures internal validity by ensuring that the researcher is interpreting the interview in the way that the interviewee intended (Merriam & Tisdell, 2016). The interviews were also triangulated with data from the participation logs and the STAI pretest and posttest, to ensure reliability and validity of results. Finally, interview participants were selected for maximum variation. By purposefully selecting for variation in interviewees, it was more likely that the stories sampled express the full range of experiences by the participants (Merriam & Tisdell, 2016). All of these methods together helped ensure reliability and validity of results.

3.10 The Intervention

Participants in the experimental group underwent an audio-guided MBSR stress relief intervention. MBSR is a program outlined in the book *Full Catastrophe Living* by Jon Kabat-Zinn. This is the foundational work in the field and the basis of all MBSR programs. The traditional MBSR program is a series of forty-five-minute guided meditations practiced over the course of eight weeks. These guided mediations are available as audio files and on the CD *Guided Mindfulness Meditation Series 1*. These CDs consists of four different forty-five-minute meditations entitled *Body Scan*

Meditation, Mindful Yoga 1, Sitting Meditation, and Mindful Yoga 2. One of these meditations was completed each day, six days of the week for eight weeks. A brief description of each of the meditations is given below, in table 3.1.

Table 3.1

Description of each Mindfulness Exercise

Name	Description
Body Scan	The body scan meditation is meant to re-establish a connection with the body. The person completing the meditation lies on their back and systematically moves the focus of their mind through different regions of their body. Attention begins at the toes, then it is focused up through the legs, the torso, the arms and finally the head. Thus, the person completes a full mental “scan” of their own body. This meditation teaches awareness of breath and body, which are key foundational skills used in other meditations in the program (Kabat-Zinn, 2013).
Mindful Yoga 1	Yoga is also about unifying the body and the mind. The yoga meditations move slowly through positions, with an emphasis on breath and awareness. Yoga 1 is a series of poses lying down on the ground. The exact sequence of positions for yoga 1 is included in the appendix.
Mindful Yoga 2	Yoga 2 is a series of standing poses. The exact sequence of positions for yoga 2 is included in the appendix.
Sitting Meditation	A meditation completed in the sitting position. The audio file guides the participant through awareness of breath, sounds, thoughts, and a sense of the body as a whole.
Self-Directed Practice	The participant completes any combination of the above mindfulness exercises lasting 45 minutes, without the use of the guided audio files.
Choice	The participant may choose any of the above mindfulness exercises, depending upon their individual wants and needs.

The schedule of the meditations is given below in table 3.2:

Table 3.2*Schedule of Meditations*

Week	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
1	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan
2	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan
3	Body Scan	Mindful Yoga 1	Body Scan	Mindful Yoga 2	Body Scan	Mindful Yoga 1
4	Body Scan	Mindful Yoga 2	Body Scan	Mindful Yoga 1	Body Scan	Mindful Yoga 2
5	Sitting Meditation	Mindful Yoga 1	Sitting Meditation	Mindful Yoga 2	Sitting Meditation	Mindful Yoga 1
6	Sitting Meditation	Mindful Yoga 2	Sitting Meditation	Mindful Yoga 1	Sitting Meditation	Mindful Yoga 2
7	Self-directed Practice	Self-directed Practice	Self-directed Practice	Self-directed Practice	Self-directed Practice	Self-directed Practice
8	Choice	Choice	Choice	Choice	Choice	Choice

Participants in the experimental group completed this program on their own time at home. This was a necessity for this study as the time requirement for the experimental group was significant and not possible during the school day. Teachers in the experimental group had access to the audio files and were able to play them as needed. It is specifically mentioned by Jon Kabat-Zinn that these meditations can be completed at any time of the day, and so this freedom did not add excess variability to the study, as all members of the experimental group still be completed a self-guided version of the MBSR program.

The control group did not complete the MBSR program. Instead, they continued to go about their lives as usual. They then took the posttest after eight weeks at the same time as the treatment group. This control group was critical, as it allowed a baseline

measure of stress and a point of comparison. The school year is often a tumultuous time and it was important to determine if any measured changes in stress were due to the intervention or were simply a result of the changing stress of the school environment. Many events, such as winter break, changing administrative policy, or a student death were likely to affect the stress levels of all teachers. It was important to determine if there was a difference between the control group and the MBSR treatment group. Doing so allowed the study to conclude if any changes in stress seen in the study were due to the MBSR intervention or were instead due to background changes in the stress level of the environment that affected all teachers.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

The purpose of this study was to explore the effectiveness of a Mindfulness Based Stress Reduction intervention on reducing teacher stress. It aimed to explore how effective the intervention was—if at all—and to capture the experience of the study participant. All of this information would hopefully allow Glenmoore to determine if such an intervention was right for its teachers, and if similar interventions should be taken in the future. This study used a mixed-methods explanatory sequential design to try to answer the following research questions:

1. What effects does a self-guided, audio-based, Mindfulness Based Stress Reduction (MBSR) intervention have on teachers in a large public high school?
2. How sustainable is the MBSR program and what factors affect program completion?

While there have been many mindfulness studies conducted in recent years, this study is significant because it is one of the few audio-based, self-guided mindfulness interventions ever conducted on secondary staff. In addition, the local knowledge generated by this study will be of unique use the Glenmoore High community. The staff has endured a difficult year, and knowledge from this study may help protect the staff in stressful years to come.

4.2 Description of the Sample

The research questions were answered by collecting data from pretest and posttest surveys, interviews, and participation logs. Overall, 38 teachers agreed to participate in the study. Of these 38 teachers, 14 opted to be a part of the experimental group. This group underwent the mindfulness intervention while the control group did not. All thirty-eight study participants completed the State Trait Anxiety Index (STAI) pretest and posttest. Table 4.1 summarizes the demographic information of the study participants.

Table 4.1
Demographic Information of Study Participants

	Experimental Group <i>n</i> = 14		Control Group <i>n</i> = 24	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	5	36	12	50
Female	9	64	12	50
Age				
20-29	1	7	1	4
30-39	4	29	7	28
40-49	4	29	8	32
50-59	4	29	7	28
60-69	1	7	1	4
Racial or Ethnic Identity				
White	14	100	21	84
Hispanic/Latino			3	12
Asian			1	4

The members of the experimental group also completed a participation log (appendix C), tracking the progress of their mindfulness work. All fourteen members of the experimental group completed a participation log, and these logs were used to generate fidelity data. This data was used to answer questions about sustainability of the program, as well as to explore the link between participation fidelity and outcome of stress reduction.

Finally, three members of the experimental group were selected for interviews. These three members were intentionally selected to have maximum variation. Selection criteria for interviews included experience with mindfulness, age, and STAI score change. The three candidates selected for interviews represented great diversity in all of these categories. One was younger, one was middle-aged, and one was older. One had no experience with mindfulness, one had some experience, and one had a great deal of experience. One of the interviewees had the greatest change in STAI scores, one had the least change in STAI scores, and one had an average change in STAI scores. Interviews were conducted, transcribed and coded to grant further insight into the experience of the mindfulness intervention.

4.3 Results and Findings

The quantitative results and qualitative findings are organized here by data collection method. First, the results of the pretest and posttest surveys are presented, then the findings of the interviews, and lastly the fidelity data.

Results from STAI Pretest Surveys

Table 4.2
STAI Pretest Scores

	Experimental Group	Control Group	<i>t</i>	<i>df</i>	<i>p</i>
<i>n</i>	14	24			
Pretest State score			2.0155	36	.0514
Mean	42.43	36.04			
SD	9.09	9.61			
Pretest Trait score			1.0602	36	.2961
Mean	40.5	36.96			
SD	6.62	11.39			

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4.2 shows the two-tailed, heteroscedastic, unpaired *t*-test comparison of the pretest STAI state and trait scores. The STAI is a 40-question Likert-scale survey that

gathers information about state anxiety (how stressed someone is at this moment) and trait anxiety (how stressed someone is generally). The minimum score for each marker (state and trait anxiety) is a 20—indicating extremely low levels of stress, and the maximum score is an 80—indicating incredibly high levels of stress. Average scores for working adults tend to be around 36 for state scores and 35 for trait scores (Spielberger, 2021).

It is clear from Table 4.2 that there is no statistically significant difference between the pretest state scores of the experimental group ($M = 42.43$, $SD = 9.09$) and the pretest state scores of the control ($M = 36.04$, $SD = 9.61$) group, $t(36) = 2.0155$, $p = .0514$. Furthermore, there is no statistically significant difference between the pretest trait scores of the experimental group ($M = 40.5$, $SD = 6.62$) and the pretest trait scores of the control ($M = 36.96$, $SD = 11.39$) group, $t(36) = 1.0602$, $p = .2961$. These results suggest that both groups started the experiment with statistically similar state and trait pretest scores. In other words, both groups began the experiment from a similar place. This suggests that even though members of the experimental group were selected using an opt-in basis, there was no statistically significant bias in selection of individuals with particularly high or low levels of stress. The two cohorts are relatively equal at the start of the experiment. Further analysis will be conducted in the analysis section of this chapter.

Table 4.3*Pretest and Posttest Comparison for the Control Group*

	Pretest	Posttest	<i>t</i>	<i>df</i>	<i>p</i>
<i>n</i>	24	24			
State score			1.1106	23	.2782
Mean	36.04	39.17			
SD	9.61	12.84			
Trait score			0.3680	23	.7163
Mean	36.96	37.38			
SD	11.39	11.85			

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4.3 shows the two-tailed, heteroscedastic, paired *t*-test comparison of the pretest STAI state and trait scores to the posttest STAI state and trait scores for the control group. As seen in table 4.3, there is no statistically significant difference between the pretest state scores ($M = 36.04$, $SD = 9.61$) and the posttest state scores ($M = 39.17$, $SD = 12.84$) of the control group, $t(23) = 1.1106$, $p = .2782$. There is also no statistically significant difference between the pretest trait scores ($M = 36.96$, $SD = 11.39$) and the posttest trait scores ($M = 37.38$, $SD = 11.85$) of the control group, $t(23) = 0.3680$, $p = .7163$. These results suggest that the control group had no statistically significant changes in their state or trait anxiety over the course of the eight-week study. This suggests that any statistically significant changes seen in the experimental group are due to the MBSR intervention. In other words, the control group did indeed function as a solid baseline control to which the experimental group could be compared. Further exploration of these results will continue in the analysis section of this chapter.

Table 4.4*Pretest and Posttest Comparison for the Experimental Group*

	Pretest	Posttest	<i>t</i>	<i>df</i>	<i>p</i>
<i>n</i>	14	14			
State score			3.7956	13	.0022**
Mean	42.43	30.36			
SD	9.09	6.74			
Trait Score			3.2713	13	.0061**
Mean	40.50	33.36			
SD	6.62	5.85			

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4.4 shows the two-tailed, heteroscedastic, paired *t*-test comparison of the pretest STAI state and trait scores to the posttest STAI state and trait scores for the experimental group. As seen in table 4.4, there is a strongly statistically significant difference between the pretest state scores ($M = 42.43$, $SD = 9.09$) and the posttest state scores ($M = 30.36$, $SD = 6.74$) of the experimental group, $t(13) = 3.7956$, $p = .0022^{**}$. There is also an extremely statistically significant difference between the pretest trait scores ($M = 40.5$, $SD = 6.62$) and the posttest trait scores ($M = 33.36$, $SD = 5.85$) of the experimental group, $t(13) = 3.2713$, $p = .0061^{**}$. This suggests that the mindfulness intervention significantly reduced both the state anxiety and the trait anxiety of members of the experimental group. Further exploration of these results will continue in the analysis section of this chapter.

Interview Findings

Table 4.5*Major Theme: Enhanced Regulation*

Theme	Code	Quote
Enhanced Regulation	Attention Regulation	<p>“I genuinely feel like even just that [mindfulness] in particular has helped me so much in like identifying spirals of worry and being able to interrupt them.”</p> <p>“I can control my thoughts.”</p>

	<p>“but also, like not feeling guilty or feeling like I was terrible at mindfulness like what’s wrong with me if I can’t like turn this spiral off, or like why is today so much harder? Like I wasn’t feeling that, I didn’t think that anymore.”</p> <p>“I can interrupt this cycle of worry that I have over things and that there are like legitimate things to worry about but also that there are things that aren’t worth worrying about.”</p>
Body Awareness	<p>“I really got more in tune [with my body].”</p> <p>“...maybe it didn’t help calm me, or you know some of the stress, it just made me more aware.”</p> <p>“I also fall asleep way faster, which is really, really, nice because I just like run through body scan and that’s been really, really, nice.”</p> <p>“I genuinely feel so much less stressed out than I did in the beginning”</p>
Emotional Regulation	<p>“I did feel a difference. I felt a little more self-regulated in the sense you know, in the calming. I got in touch, you know, that this isn’t fight, flight or freeze.”</p> <p>“And what I’ve learned through my mindfulness practice is that, it gives me the space to breathe and decide if what’s going to come out of my mouth is going to be constructive. And I would say about 7 out of 10 times it’s not. Ok, and the breath work, I feel it. It’s like Oh! There’s my nostrils, there’s the breath, oh! I’m not going to say that out loud. I’m gonna keep that. So it provides a filter.”</p> <p>“So, mindfulness for me is a way of dealing with stress by actually going inward. Instead of trying to distract myself from the situation which doesn’t actually fix anything it’s instead like going inward and being aware of what I’m feeling and being non-judgmental about what I’m feeling and why and just accepting that this is how I’m feeling and this is how I feel. And it just felt like it gave me a lot of power and control of my thoughts in stressful situations.”</p> <p>“I kind of learned through [mindfulness] that there is a way to handle stressful situations where things are fixed and things get better without having the intense emotional reaction that I used to have of feeling so massively overwhelmed where I was incapable of doing even small tasks and I would have to completely check out and that would be coupled with a feeling of inadequacy and guilt. It’s nice just being able to stop myself before that happens.”</p>
Changes in Perspective on the Self	<p>“I think we can be not only healthier, but make wiser decisions, be more of a society contributor, you know, in a much more positive state. I really feel like the more you can</p>

	understand who you are, that authentic self, you'll be comfortable in that, you know?"
	"I mean I have a friend who does like silent retreats and she loves it because it's something where she goes into her own mind and like she never wanted to be afraid of her own thoughts and I used to think that that was nuts and I didn't understand how anyone would want to do that and I genuinely think that my favorite part really was body scan not physical motion and you know, just me and my thoughts and just like being aware and just like being aware and like channeling my thoughts instead of just into like stressful spirals of worry about all the different things that were going on in my life it instead just interrupted that cycle and instead I just focused on the words and like what it was saying and it was really calming and non-judgmental as well."
	"I was thinking back to all the things that happened to me during those eight weeks [of the study] and like how many stressful on paper things that normally would have stressed me out like how many of those things happened and I just genuinely didn't feel overwhelmed in a way that was really unexpected for me just based on the past it just didn't seem like the normal proportional response that I was used to having, based on all those stressful situations."
	"It's been really helpful. Like I really, I'm so glad that I did this. And it changed me in ways that... like I legitimately wasn't expecting for this to matter at all because I was so skeptical of mindfulness going into it like I legitimately didn't feel like it was going to work, and I was kind of resistant, but I was just going to do it like, just to see, and follow through, because I had to follow through, and ... it legitimately changed my life. Like I genuinely feel like I have intentional tools to help me deal with stressful situations, in a way that doesn't manifest as personal, physical stress, and that's been really great. It's been really nice to like feel like I can, that I don't have to be stressed out, and that I can actually do things to get myself out of stressful spirals, and thoughts, and worries and things like that."

Table 4.5 shows how interviewees in the experimental group demonstrated enhanced regulation, as outlined by Hölzel et al., 2011. They demonstrated increased attention regulation, increased body awareness, increased emotional regulation, and a

change in perspective of the self, the four main pillars of Enhanced Regulation Theory (Hölzel et al., 2011). The increased attention regulation is shown in quotes such as “I can control my thoughts” and “I can interrupt this cycle of worry that I have over things and that there are like legitimate things to worry about but also that there are things that aren’t worth worrying about.” These quotes show that the participants now have a greater ability to control what their mind pays attention to. Increased body awareness is shown in quotes such as “I really got more in tune” and “...maybe it didn’t help calm me, or you know some of the stress, it just made me more aware” as well as “I genuinely feel so much less stressed out than I did in the beginning”, which all speak to awareness of feelings in the body. In addition, interviewees demonstrated increased emotional regulation. This was readily apparent in quotes such as:

And what I’ve learned through my mindfulness practice is that, it gives me the space to breathe and decide if what’s going to come out of my mouth is going to be constructive. And I would say about 7 out of 10 times it’s not. Ok, and the breath work, I feel it. It’s like Oh! There’s my nostrils, there’s the breath, oh! I’m not going to say that out loud. I’m gonna keep that. So it provides a filter.

and

I kind of learned through this is that like there is a way to handle stressful situations where things are fixed and things get better without having like the intense emotional reaction that I used to have of like feeling so massively overwhelmed where like I was incapable of doing like even small tasks and I would like have to completely check out and that would be coupled with like a

feeling of inadequacy and guilt and just being able to stop myself before that happens.

These quotes clearly demonstrate an increased ability to regulate emotions.

Finally, interview participants showed a change in perspective of the self, as seen in quotes such as:

It's been really helpful. Like I really, I'm so glad that I did this. And it changed me in ways that... like I legitimately wasn't expecting for this to matter at all because I was so skeptical of mindfulness going into it like I legitimately didn't feel like it was going to work, and I was kind of resistant, but I was just going to do it like, just to see, and follow through, because I had to follow through, and... it legitimately changed my life. Like I genuinely feel like I have intentional tools to help me deal with stressful situations, in a way that doesn't manifest as personal, physical stress, and that's been really great. It's been really nice to like feel like I can, that I don't have to be stressed out, and that I can actually do things to get myself out of stressful spirals, and thoughts, and worries and things like that.

The interviewee clearly has a different perspective on themselves and what they are capable of as a result of this study. All interviewees demonstrated increased attention regulation, increased body awareness, increased emotional regulation, and a change in perspective of the self.

Table 4.6

Major theme: Factors Affecting Fidelity

Theme	Code	Quote
	Time	"The challenge was definitely the time."

Factors Affecting Fidelity	“It can be intimidating on paper to like do the 45 minutes a day, but I genuinely got so much out of it by like, not doing all of the 45 minutes a day, that I think there is a way to do this program that does work for teachers even if they are like super busy.”
	“So, time was my biggest challenge, and prioritizing, because you make time for the things you really want to do. And I, on some of those days it just wasn’t priority at the time.”
	“It doesn’t have to be like 8 weeks and 45 minutes a day, cause I think that’s really hard to do.”
	“I might not say you need to do 45 minutes every day, I might say hey, try three breaths every morning, and then every night.”
Perceived Legitimacy	“I was always really skeptical of [mindfulness] because the people who would come in would provide almost no data and it was a lot about breathing and telling students to like take two deep breaths before a test or something like that and it never felt like it was significant.”
	“Oh [mindfulness is] so <i>woo woo</i> .”
	“My impression was that mindfulness was just kind of taking deep breaths and like for some reason that was supposed to like cure your anxiety.”
	“I talked about [mindfulness] to other math teachers and some of the science teachers and we all kind of have the same view about it [being illegitimate], I mean like research is really powerful and it was never ever presented in way that felt like, I mean I was shocked when learning about this program, that there was so much research that was behind mindfulness.”
Discomfort	“Because they think [mindfulness is] just ‘oh your just meditating <i>blah blah blah</i> ’”
	“The resistance [to mindfulness] comes from that fear of feeling our emotions and facing our trauma.”
	“[trauma is] the first thing that comes up right when you are quiet. I would say that would be the biggest resistance to it.”
	“I didn’t understand how anyone would want to [be alone with their thoughts].”
	“I hear ‘oh [mindfulness is] not real, that’s not going to be good for me, I’m not into that’. But it’s like broccoli, right?”

	Did you try it? No? Okay, well then don't tell me you don't like broccoli."
	"The first few times I sat I didn't like it at all, but after you sit for a while, I was saying this to the dad who was complaining his kid was bored, if you give it time, you'll get the fruit. But, with anything it takes time. So, we're in this instant gratification culture and civilization that we push one button and something shows up on our doorstep the next day, we binge a show, we don't have to wait a week for the next episode to come out, and so we want the same thing with any type of self-care any type of self-help but with mindfulness it's going to take a little bit of time. And if we give it time, it will do the work it needs to do in you. Which might be very different than the work that I need. Because we all need different things, right? But the more we can connect with our inner self, our inner world, the more clear we are going to be in the outer world."

Table 4.6 shows how people in the experimental group who were interviewed mentioned different factors affecting fidelity. The major factors mentioned by interviewees were time, the perceived legitimacy of mindfulness, and discomfort. Time as a factor was clearly demonstrated in the quotes "the challenge was definitely the time" and "It can be intimidating on paper to like do the 45 minutes a day, but I genuinely got so much out of it by like, not doing all of the 45 minutes a day, that I think there is a way to do this program that does work for teachers even if they are like super busy." These quotes and others pulled from the interviews demonstrated that the program time commitment of 45 minutes a day was certainly a challenge. The perceived legitimacy of mindfulness was also raised as an obstacle to program completion. This was seen in quotes such as "I was always really skeptical of [mindfulness] because the people who would come in would provide almost no data and it was a lot about breathing and telling

students to like take two deep breaths before a test or something like that and it never felt like it was significant” and “Oh [mindfulness is] so *woo woo*” as well as:

“I talked about [mindfulness] to other math teachers and some of the science teachers and we all kind of have the same view about it [being illegitimate], I mean like research is really powerful and it was never ever presented in way that felt like, I mean I was shocked when learning about this program, that there was so much research that was behind mindfulness.”

All of these quotes show resistance to mindfulness work due to a lack of perceived legitimacy. Finally, discomfort was shown to be a factor affecting program completion. This was demonstrated in quotes such as “The resistance comes from that fear of feeling our emotions and facing our trauma” and “I didn’t understand how anyone would want to [be alone with their thoughts]” and “I hear ‘oh [mindfulness is] not real, that’s not going to be good for me, I’m not into that’. But it’s like broccoli, right? Did you try it? No? Okay, well then don’t tell me you don’t like broccoli.” These quotes all show clearly that discomfort might be a factor that prevents people from doing mindfulness work. Overall, the interviewees clearly showed that time, perceived legitimacy, and discomfort were all factors that might prevent people from completing the Mindfulness Based Stress Reduction program.

Results of Participation Logs and Fidelity Scores

Table 4.7

Descriptive Statistics of Fidelity Scores

<i>n</i>	14
Minimum	0
Maximum	0.85
M	0.458
SD	0.282

Table 4.7 shows the descriptive statistics associated with the fidelity scores of members of the experimental group. There were 14 who completed the study. The minimum fidelity score was zero, meaning that the participant did not do any of the work in the MBSR program. The maximum score was 0.85, meaning that the participant did what they were supposed to do about eighty-five percent of the time during the eight weeks of the study. The mean fidelity score was 0.458 with a standard deviation of 0.282. This means the average study participant only completed around forty-five percent of the exercises required by the study. While the fidelity score is not exactly percent completion, it is the closest approximation of it that the researcher could produce. Details of how it was calculated were included in chapter three.

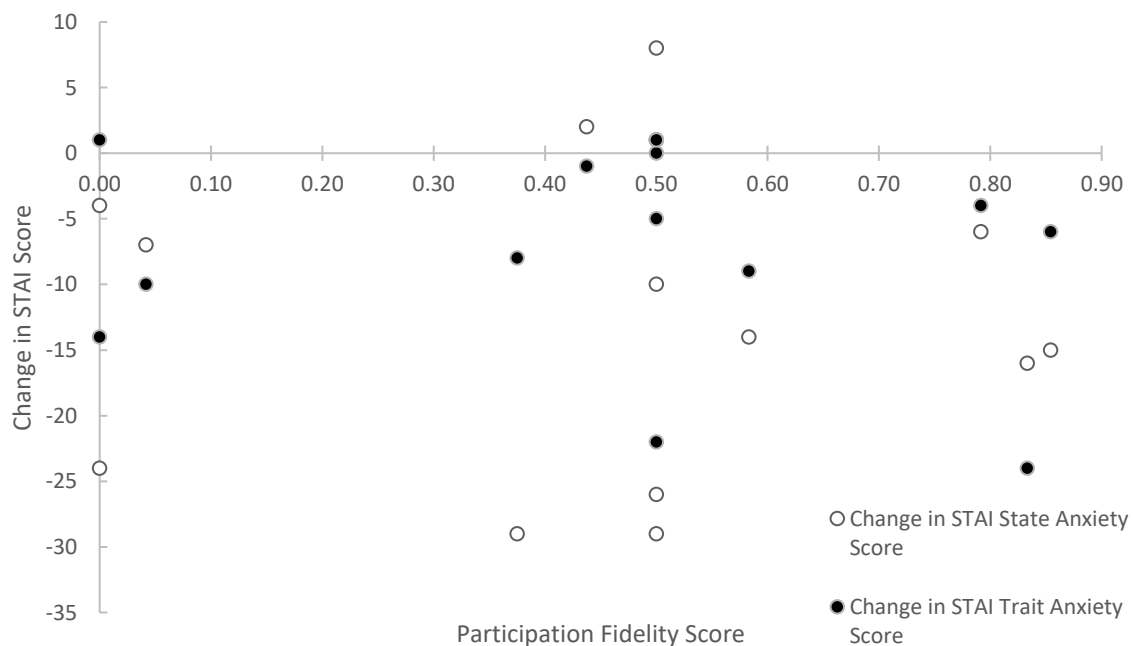


Figure 4.1
Changes in STAI State and STAI Trait Scores and Participation Fidelity

Figure 1 shows the relationship between the change in the STAI score and participation fidelity score for members of the experimental group. This figure shows

visually that there is no clear correlation between participation fidelity and change in STAI score. This correlation is explored in more depth in table 4.8.

Table 4.8

Regression Analysis of Fidelity Scores and Changes to STAI Scores

Comparison of Fidelity Score and Change in STAI Score	R^2	F	df	p
<i>STAI State Score</i>	0.00000	0.0000	1,12	0.9927
<i>STAI Trait Score</i>	0.01832	0.2240	1, 12	0.6445

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 4.8 shows the regression analysis of the fidelity scores and the changes to STAI scores. There were no statistically significant correlations between fidelity scores and changes in STAI scores. Fidelity scores did not predict change in STAI state score, $R^2 = 0.00000$, $F(1,12) = 0.0000$, $p = 0.9927$. Fidelity scores also did not predict change in STAI trait score, $R^2 = 0.01832$, $F(1,12) = 0.2240$, $p = 0.6445$. These results clearly demonstrate that fidelity scores in no way predicted the change in STAI score. This result held true for both change in STAI state score and STAI trait score.

4.4 Analysis

This study sought to answer two research questions:

1. What effects does a self-guided, audio-based, Mindfulness Based Stress Reduction (MBSR) intervention have on teachers in a large public high school?
2. How sustainable is the MBSR program and what factors affect program completion?

Answer to the first research question – effects on teachers

This study highlighted a variety of effects that the MBSR intervention had on teachers at Glenmoore High School. Firstly, this study found that the MBSR intervention significantly reduced both the state anxiety and the trait anxiety of teachers. The

experimental group and the control group started with statistically similar STAI pretest scores for both state anxiety ($t(36) = 2.0155, p = .0514$) and trait anxiety ($t(36) = 1.0602, p = .2961$). This shows there was not a statistically significant selection bias of stressed teachers into the experimental or control group. Even though teachers self-selected into the experimental group, the study began with an even baseline for stress measures between the experimental and control group. The experimental group experienced an extremely statistically significant reduction in both state anxiety ($t(13) = 3.7956, p = .0022^{**}$) and trait anxiety ($t(13) = 3.2713, p = .0061^{**}$) after undergoing the MBSR intervention. These results strongly contrast with those of the control group, which experienced no statistically significant change at all in either their state anxiety ($t(23) = 1.1106, p = .2782$) or their trait anxiety ($t(23) = 0.3680, p = .7163$). The results of the control rule out the possibility that the school year just got less stressful for everyone and other such general explanations. As a result, this study finds that the MBSR intervention did have a statistically significant effect at reducing state and trait STAI anxiety scores, and therefore successfully reduced teacher stress. This finding was further reinforced by the qualitative interviews, where several interviewees explicitly mention being less stressed than they were at the start of the study (e.g. “I genuinely feel so much less stressed out than I did in the beginning”).

Secondly, this study found that the MBSR intervention led to enhanced regulation—with interviewees reporting greater attention regulation, body awareness, emotional regulation, and a change in perspective on the self. Greater attention regulation was seen in quotes such as “I can control my thoughts” and “I can interrupt this cycle of worry that I have over things and that there are like legitimate things to

worry about but also that there are things that aren't worth worrying about." Both of these statements indicate the person has increased control over what they are allocating their attention and thoughts. Interviewees also indicated greater body awareness with quotes such as: "I really got more in tune [with my body]." Perhaps the greatest changes were seen in emotional regulation, with quotes from the interviews such as:

I kind of learned through [mindfulness] that there is a way to handle stressful situations where things are fixed and things get better without having the intense emotional reaction that I used to have of feeling so massively overwhelmed where I was incapable of doing even small tasks and I would have to completely check out and that would be coupled with a feeling of inadequacy and guilt. It's nice just being able to stop myself before that happens.

Finally, the interviewees indicated a great change in perspective in the self. One interviewee mentioned:

It legitimately changed my life. Like I genuinely feel like I have intentional tools to help me deal with stressful situations, in a way that doesn't manifest as personal, physical stress, and that's been really great. It's been really nice to like feel like I can, that I don't have to be stressed out, and that I can actually do things to get myself out of stressful spirals, and thoughts, and worries and things like that.

Therefore, this study finds that the MBSR intervention led to enhanced regulation of the participants, specifically in the areas of attention regulation, body awareness, emotional regulation and changes in perspective of the self.

Answer to the second research question – sustainability and factors affecting completion

This study found that all teachers had trouble completing the MBSR intervention. This was seen in the fidelity data, with a mean fidelity score of 0.458 with a standard deviation of 0.282. This means that on average teachers only completed about 45% of the required activities in the MBSR intervention. Some teachers completed more, and some did none of the activities at all. Interestingly, the regression analysis found no correlation between fidelity score and change in either STAI state score ($R^2 = 0.00000$, $F(1,12) = 0.0000$, $p = 0.9927$) or STAI trait score ($R^2 = 0.01832$, $F(1,12) = 0.2240$, $p = 0.6445$). It is not possible to predict how much stress reduction a member of the experimental group will measure based on how much of the program they complete.

This study also found that time, perceived legitimacy, and discomfort were all factors that may affect program completion. All interviewees found that the program took too much time, with concerns such as “The challenge was definitely the time” and “It doesn’t have to be like 8 weeks and 45 minutes a day, cause I think that’s really hard to do.” Interviewees suggested reducing the time required each day: “I genuinely got so much out of it by like, not doing all of the 45 minutes a day, that I think there is a way to do this program that does work for teachers even if they are like super busy” and “I might not say you need to do 45 minutes every day, I might say hey, try three breaths every morning, and then every night.” The concern about time is also supported by the fidelity data, which shows that no one was able to devote forty-five minutes a day for eight weeks. There were also concerns raised from the interviews that mindfulness might not be perceived as legitimate. Quotes such as “Oh [mindfulness is] so *woo woo*” and “I was

always really skeptical of [mindfulness] because the people who would come in would provide almost no data and it was a lot about breathing and telling students to like take two deep breaths before a test or something like that and it never felt like it was significant” convey the general sense of skepticism that was shared by some of the interviewees and the staff at Glenmoore High. Finally, it was pointed out by the interviewees that mindfulness can be an uncomfortable process, and that some people might avoid it for that reason. This was evident in quotes such as “The resistance [to mindfulness] comes from that fear of feeling our emotions and facing our trauma” and “[trauma is] the first thing that comes up right when you are quiet. I would say that would be the biggest resistance to it.” All of these factors may prevent people from attempting or completing a MBSR intervention. The idea that there might be some concerns and resistance to a mindfulness intervention is also supported by the sample size data from the experimental and control groups, as many more teachers opted not do the MBSR intervention ($n = 24$) than opted to complete the MBSR intervention ($n = 14$).

Even though the experimental group show measured changes in stress, most of the participants had great difficulty completing the program. This was seen in both the fidelity data and the interviews. It is unlikely that they would be able to continue such a practice. Therefore, this study finds that the MBSR intervention, although effective, is not a sustainable method of stress reduction for high school teachers. Factors that may influence the ability of teachers to complete such a mindfulness intervention include time, perceived legitimacy, and discomfort.

4.5 Summary

Teachers in the experimental group who underwent the MBSR intervention significantly reduced both their state and trait anxiety. The control group, who did not undergo the intervention, did not experience any reduction. Teachers who underwent the MBSR intervention also enhanced their regulation abilities, with increased attention regulation, increased body awareness, increased emotional regulation, and a change in perspective on the self. Interviews suggested that time, lack of perceived legitimacy, and discomfort were the main factors that might affect MBSR sustainability and completion. Fidelity data supported the idea that the MBSR intervention was not sustainable for teachers, with the average teacher in the experimental group completing less than half of the required exercises from the MBSR intervention. However, no correlation was found between the amount of the MBSR intervention completed and the change in STAI scores—suggesting that it doesn’t matter how much of the program is completed, just that it is attempted at all.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

5.1 Overview of Study

Teachers are an enormously stressed-out group of people (Gallop, 2014). That stress can have devastating consequences for their health (McNeely, C., & Blanchard, J., 2009; Salleh, 2008; Schneiderman et al., 2005), cost school districts an excessive amount of money (Greenberg et al., 2016), and result in extremely negative outcomes for the students in their classrooms (Greenberg et al., 2016; Hoglund, Klinge, & Hosan, 2015). The teachers at Glenmoore High were having an especially stressful year, with high rates of turn-over, unexpected trauma, and the COVID-19 pandemic. In order to help combat that teacher stress, this study examined the effectiveness of an audio-based, self-directed MBSR intervention. While there have been many studies conducted on mindfulness, this study is significant as it is only one of a few studies ever conducted using an audio-based, self-directed mindfulness intervention. In addition, by using an action research approach, this study generated important local knowledge that could directly impact the practice and future policy making of Glenmoore and its school district. While Glenmoore's school district has implemented some mindfulness initiatives, no studies have ever investigated the effectiveness and sustainability of these programs for these particular teachers in this local environment.

Previously, the mindfulness initiatives that Glenmoore had offered were mindfulness professional developments for teachers. These were optional professional developments that teachers had to sign up for and attend outside of school hours. There was a cost associated with these classes, but that cost was supplemented with grant money. Sometimes teachers would have to drive to separate locations, and sometimes these developments were offered at Glenmoore. These instructor-led mindfulness classes generally met once a week for an hour or two and lasted eight weeks. There are a number of differences between this previous mindfulness work and the mindfulness work done in this study. First, previous options were instructor led, while this option was audio-based. Secondly, the previous options required meeting in a group once a week. This option allowed teachers to complete the work on their own according to their own schedule. Additionally, the time commitment for MBSR was significantly greater than the time commitments of programs previously offered at the school. As evidenced from the data collected in the study, time commitment did not work in the program's favor. The most significant difference between the mindfulness options that were previously offered for teachers at Glenmoore and this study was the data driven approach that this research took. Previous mindfulness work at Glenmoore has not been "data first" and as a result has alienated many of the more data-driven teachers at the school. There was especially high resistance from math and science teachers at Glenmoore. One of the main aims of this study was to generate local knowledge and determine if a mindful approach was indeed effective at reducing teacher stress. This data-driven approach was popular with the staff, as one-third chose to participate in this study. Therefore, this study is especially meaningful to the Glenmoore community because by collecting data, it has directly

addressed the barrier of perceived legitimacy for teachers completing mindfulness work. The findings of this study will not only allow Glenmoore to better hone the mindfulness options currently available to teachers, but may also provide current staff with a reason to give those previously offered professional developments a try.

This study used Holzel et al. (2011)'s theory of enhanced self-regulation as the theoretical framework, as this theory helps explain the underlying mechanisms of mindfulness work. This framework undergirded the entire study and provided a lens through which the results were interpreted. This study used a teacher-as-researcher-and-participant action research explanatory sequential mixed-method approach. Overall, 38 teachers agreed to participate in this study. Participants self-selected into an experimental group ($n = 14$), which underwent the MBSR stress reduction intervention, and a control group ($n = 24$), which did not. Using this approach, this study sought to answer the following two research questions:

1. What effects does a self-guided, audio-based, Mindfulness Based Stress Reduction (MBSR) intervention have on teachers in a large public high school?
2. How sustainable is the MBSR program and what factors affect program completion?

These research questions were each answered through a combination of qualitative and quantitative data. There were three main sources of data collected for this study. First, quantitative data was collected with an STAI pretest and posttest. Secondly, qualitative data was gathered through interviews with select participants in the experimental group. Lastly, participation logs were collected from members of the

experimental group. This program completion data was quantitatively analyzed to determine participation fidelity.

This study found a statistically significant reduction in stress in the teachers in the experimental group, and no statistically significant change in stress for the control group. In addition, interviewed teachers in the experimental group exhibited enhanced regulation, with increased attention regulation, increased body awareness, increased emotional regulation, and a change in perspective on the self. This study also found that time, perceived legitimacy, and discomfort may all be factors that affect completion of mindfulness work. Finally, this study found that participation fidelity in the experimental group was low, but that it was not correlated with stress reduction outcomes. These findings allowed the study to answer the research questions as followed:

1. The MBSR intervention had two key effects on teachers. Firstly, it reduced their stress in a statistically significant and measurable way. Secondly, it led to enhanced regulation in teachers with increased attention regulation, increased body awareness, increased emotional regulation, and a change in perspective on the self.
2. While the MBSR intervention is effective, it is unlikely to be a sustainable stress reduction option for teachers. This is because of the high time requirement, the perceived legitimacy of mindfulness, and the discomfort associated with the process. Teachers had trouble completing the mindfulness exercises in the MBSR program, but their participation was not a predictor of their stress reduction outcome.

5.2 Results and Findings Related to Existing Literature

This section breaks down the results and findings of this study, and how each of those relates to the existing literature. This section fits the results and findings of this study into the wider body of knowledge surrounding mindfulness work.

Results of the Pretest Surveys

This study found that the pretest STAI results for the experimental group and the control group were statistically similar. While it is not surprising that the two groups had statistically similar pretest scores, it is surprising that their average scores for stress were close to the national average for working adults who take the STAI (Spielberger, 2022). Research indicates that teachers are an especially stressed group of working adults (Gallop, 2014; Smith et al., 2004), so it was expected that the teachers at Glenmoore who were enduring an especially stressful year would have significantly higher STAI pretest scores. However, upon closer examination of the research surrounding teacher stress, these results seem less surprising. Even though Glenmoore has endured many stress-inducing events – poor relationships with administration, high amounts of turnover, student deaths, assault and trauma – which all have been shown to increase teacher stress (Beteille, Kalogrides, & Loeb, 2011; Johnson, Kraft, & Papay, 2012; Kapadia, Coca, & Easton, 2007; Kyriacou, 2001), there are also many ways in which Glenmoore is especially well supported. Of the four main causes of teacher stress—school organization, job demands, work resources, and teacher’s social-emotional competencies (Greenberg et al., 2016)—Glenmoore is especially well supported in the areas of job demands and work resources. Glenmoore is part of the most well-funded and well-supported district in the state. Teachers at Glenmoore are responsible for 155 students,

while high school teachers in surrounding districts have 180 contract students. In addition, starting annual salaries at Glenmoore are \$15,000 higher than any other district in the state. Perhaps the support that teachers at Glenmoore receive from the district and surrounding community helps to mitigate the stressful factors they have experienced in the recent school year. When viewed through this lens, the relatively average pretest STAI scores make sense.

Results of the Posttest Surveys

This study found that the members of the experimental group who underwent the MBSR intervention showed a strongly significant reduction in stress. This result is simultaneously expected and also surprising. It is expected as the current body of research suggests that Mindfulness Based Interventions such as MBSR are effective methods of reducing stress (Breedvelt et al. 2019; Khoury et al., 2015; Klingbeil & Renshaw, 2018; Pascoe et al., 2017; Zhou et al. 2020). These results are also in line with the only previous two studies on self-guided audio-based mindfulness interventions for teachers, both of which also found a decrease in stress levels for the teachers in their experimental groups (Bakosh, 2013; James, 2016). However, these results are also surprising because current research suggests that untrained school staff without personal mindfulness practices are unlikely to deliver Mindfulness Based Interventions that support teacher outcomes (Klingbeil & Renshaw, 2018). This study's author is indeed an untrained staff member without a previous mindfulness practice, and yet the intervention significantly reduced the stress levels of the participants. Therefore, the results of this study can expand the current body of mindfulness research by suggesting that even

untrained staff can successfully deliver well-regarded Mindfulness Based Interventions such as MBSR.

This study found the control group showed no statistically significant changes in their STAI scores from pretest to posttest. Even though this was what was expected from the control group, it is still an important data point. Every school has vacillating times of stress—there are more stressful times (e.g. parent-teacher conferences, exams, and unexpected events or trauma) and less stressful times (e.g. winter break). The control group showing no statistical change suggests that the differences seen in the experimental group are due to the intervention, and not because of other factors such as the study beginning at a stressful time of the year and ending at a less stressful time. The inclusion of a control group was in line with current research suggestions to lend credibility to mindfulness studies (Breedvelt et al. 2019; Chi et al., 2018; Khoury et al., 2015; Pascoe et al., 2017).

Interview Findings: Enhanced Regulation

This study found enhanced regulation for interviewed members of the experimental group. These findings are in line with the theoretical framework that undergirds this entire study: Holzel et al. (2011)'s theory of enhanced self-regulation. According to this framework, mindfulness is effective because it is a mediation process comprised of four distinct but interrelated components: attention regulation, body awareness, emotion regulation, and change in perspective on the self (Holzel et al., 2011). Interviewees showed increased attention regulation. Increased attention regulation leads to further activation of the anterior cingulate cortex and increases its function (Holzel et al., 2011). Attention regulation is also closely tied to body awareness, which was also

demonstrated by interviewees. Body awareness is thought to lead to increased bodily sensation, which leads to changes in the cortical thickness and grey matter concentration in the brain (Holzel et al., 2011). Increased emotional regulation was also seen in interviewees. As emotional regulation increases, fear responses decrease and memory pathways become less reinforced. As a result, practitioners of mindfulness show changes in the grey matter of the hippocampus of the brain (Holzel et al., 2008; Luders et al., 2009). Finally, interviewees demonstrated a change in perspective of the self. This meta-awareness of a person knowing they are different now than they were in the past can lead to increased grey matter in the posterior cingulate cortex, the hippocampus and the temporo-parietal junction (Holzel et al., 2011). While none of these distinct changes in the brain were directly measured in this study, this study did collect qualitative evidence of all of the precursors that were identified in enhanced regulation theory that bring about these changes.

The four pillars of enhanced regulation theory all explain how mindfulness practice can lead to changes in the brain and thus changes in the person. The results of this study lend strong support to Holzel et al. (2011)'s theory of enhanced regulation, as all elements of it were directly observed in the interviews with participants in the experimental group. Participants in this group showed a strong statistically significant reduction in stress. Therefore, this study supports the idea that mindfulness works to reduce stress through enhanced regulation, and its mechanism of action may be explained through the theory of enhanced self-regulation.

Interview Findings: Factors Affecting Fidelity

This study found that time, perceived legitimacy, and discomfort may all be factors that prevent people from completing or attempting mindfulness interventions. The finding that time may be a factor affecting mindfulness completion is consistent with other authors on mindfulness (Goldberg, 2022). Perceived legitimacy is a surprising finding, as it is not mentioned as a major factor in mindfulness avoidance in the current body of mindfulness research. This study therefore expands and improves the current body of mindfulness research by suggesting that perceived legitimacy may also be an important factor to address when conducting mindfulness interventions. Discomfort as a factor that contributes to mindfulness completion is a finding from this study that is consistent with suggestions from other authors (Uptmor, 2016). One factor not identified in this study but identified in current research is improper knowledge and use of mindfulness. Not properly engaging with mindfulness—using it to avoid challenges instead of accepting them as they are, may be a major challenge to completion (Choi, Farb, Pogrebtsova, Gruman, & Grossman, 2021). The lack of this finding in this study is not surprising, as all of the study participants were given detailed instructions on how to complete all of the mindfulness exercises. Additionally, MBSR is a highly-structured research-backed program. Therefore, lack of knowledge was not likely to be mentioned by any of the MBSR intervention participants.

Results of Participation Logs and Fidelity Scores

The participation logs uncovered the result that most of the participants in the MBSR intervention completed less than half of the activities required by the program. This result is surprising, as the participants joined the experimental group knowing what

the time demands of the program were and agreeing to try to complete 100% of the activities. Perhaps this result is less surprising when considering the self-guided nature of this particular study. The original MBSR program was conducted in a guided fashion, with participants in a room completing the activities together (Kabat-Zinn et. al, 2013). This forced participants to complete 100% of the exercises in the MBSR intervention. This study finds that people are far less likely to complete all of the MBSR activities if left to their own devices. Most mindfulness studies do not include any information about participation fidelity (Klingbeil & Renshaw, 2018) and so this study expands the current body of mindfulness research by including this information, and suggesting that participation rates in many mindfulness studies may be far lower than researchers assume. Even more surprising is the finding that even with the low program fidelity scores, members of the experimental group still showed a strong statistically significant change in stress. In addition, this study found no correlation between MBSR fidelity score and change in STAI score, suggesting that the change in stress experienced by the participants is in no way related to how much of the MBSR program was completed. This is an especially surprising finding, as the only difference between the experimental group (with strong statistically significant reductions in stress) and the control group (with no statistically significant reductions in stress) was participation in the MBSR intervention. Shockingly, there were even members who were in the experimental group who completed none of the MBSR intervention who still showed greater reduction in stress than the average member of the control group. Therefore, this study expands the current body of mindfulness knowledge by suggesting simultaneously that people in self-guided mindfulness studies are not doing as many of the exercises as expected and also

that the level of participation doesn't have a statistically significant impact on their stress reduction. In terms of stress reduction, attempting the self-guided MBSR intervention is more impactful than how much of the intervention was actually completed.

5.3 Recommendations for Practice

This study has shown self-paced MBSR to be an effective, yet questionably sustainable stress reduction intervention for teachers at Glenmoore. Therefore, it is recommended that a modified MBSR intervention be used. This intervention, which aims to improve program retention and completion should be introduced in a professional development that preemptively targets the main factors that affect fidelity. The goal of this professional development is to expand this MBSR intervention and mindfulness work to teachers who didn't choose to be part of the experimental group in this study. This means finding a way to increase buy-in in stressed teachers who did not previously choose to do mindfulness work.

In order to accomplish this, the professional development needs to address the specific concerns raised from this community about the perceived legitimacy of mindfulness, the time commitment, and the discomfort. These factors need to be addressed in this order, because if teachers are not convinced of MBSR's legitimacy, then they will tune out and not listen to anything else that is said about mindfulness work. First, in order to address the concerns that teachers at Glenmoore have about the perceived legitimacy of mindfulness work, the professional development needs to begin with an explanation of the research behind MBSR. This explanation of research should include not only the research done by Kabat-Zinn on the MBSR program, but also the decades of mindfulness research that have come after. Finally, the presenter should show

that data that was gathered from this study at Glenmoore, to show the effectiveness for teachers at the school. It is critical to include this research in data to increase buy-in from teachers who normally eschew mindfulness work for these exact reasons. By doing this, the concerns about the perceived legitimacy of MBSR will be explicitly addressed.

Secondly, in order to address concerns about time and to improve the sustainability of the MBSR intervention, the professional development should make it clear that while 45 minutes a day is recommended, it is in no way required or necessary in order to see results. Teachers can do what they can, when they can, and still receive significant benefits from the program. Many teachers showed significant stress reduction even though they only completed about ten minutes of work a day. This information should reduce concerns that staff members have about time commitment. Teachers are busy people, and it must be made clear that the MBSR intervention will be a benefit, and not a time-consuming burden.

Finally, the professional development needs to address the concerns staff have about discomfort. Mindfulness can be boring, uncomfortable, or even scary work. This needs to be explicitly mentioned so that people are aware of these obstacles and better able to handle them when they arise. Teachers need to know that discomfort is part of the mindfulness process, and part of the way in which mindfulness work helps you to grow. When someone sits and their minds starts to wander, they must learn to accept that wandering, to view it nonjudgmentally, and then to refocus. Mindfulness work is a journey, not a destination. At the same time, teachers should be told how much discomfort is too much. Teachers should not be in increased physical pain or experience exacerbated emotional trauma during any of the work.

5.4 Limitations

One of the limitations of this study was the sample size. This study had 38 total participants. This is a relatively large sample of the school—it is equal to one-third of the total teachers at Glenmoore. However, even with this relatively large sample of the population of Glenmoore teachers, there were still only 14 teachers who opted into the experimental group. The sample size in this study was sufficient to draw statistically significant conclusions about this action research study at Glenmoore, but it makes it hard to generalize the results to a broader scale. Previous researchers call for more mindfulness research with large sample sizes, but acknowledge that this is a factor that plagues almost all mindfulness research (Breedvelt et al. 2019; Chi et al., 2018; Khoury et al., 2015; Pascoe et al., 2017; Zhou et al. 2020).

Another limitation of this study was selection bias. It may have been better for the participants in the study to be randomly assigned into the control and experimental groups instead of letting them self-select. The concern is that a certain type of teacher might have been more likely to opt in to the experimental group than if they were randomly assigned. For example, a stress reduction intervention might attract teachers who think they are in need of such an intervention, such as teachers who are more stressed out than their peers. If this happens, then the experimental group is no longer representative of the teacher population as a whole. Concerns of selection bias are somewhat alleviated by the pretest survey data, which did not find any statistically significant difference between the STAI pretest scores of the experimental and control groups.

This study also relied on the self-reporting of participants in the experimental group to collect fidelity data. Participants were instructed to write down what they did on a daily basis. Participants may have lied about their completion of the intervention, or simply misremembered what they did. While it is hopefully unlikely that this occurred, there was no way for the researcher to verify completion of the mindfulness exercises directly.

My positionality was also potentially a limitation in the study. All of the interviews were conducted with my colleagues, and my connection to them could have influenced what they felt comfortable disclosing in the interview process. I made every effort to ensure anonymity and obtain consent, and all interviewees seemed to have no trouble talking to me, but there is no way of knowing if my connection to them in some way influenced the validity of the data I was collecting.

Additionally, this study was conducted during the COVID-19 pandemic. Glenmoore was back to in-person school with masks at the time of the study. There is no way to know to what extent the pandemic contributed to a uniquely stressful year and influenced the results of this study. A pandemic is a unique form of stress that could have affected this study in unknown ways.

Finally, this study employed an action research methodology. It aimed to improve local knowledge and improve local practice. Like all action research, results of this study are meant to be context specific and are not meant to be widely generalizable (Efron & Ravid, 2013). This study did find the MBSR intervention to be an effective way to reduce stress in teachers at Glenmoore, but it does not aim to make broad claims about the effectiveness of self-guided audio-based interventions at secondary schools across the

nation. More studies, with larger sample sizes, across multiple high schools, and employing a traditional education research approach would have to be conducted before the results could be generalized to a wider scale.

5.5 Recommendations for Future Research

This study adds to a rapidly growing body of research that shows that mindfulness interventions, even self-guided audio-based mindfulness interventions, are effective tools for stress reduction. However, more research is certainly required.

This study recommends that future research be done in other high schools so that a larger sample of data may be gathered. This would allow researchers to determine if the MBSR intervention works best for specific groups of people. Right now, this study can only conclude that the MBSR intervention worked for 14 White teachers in an affluent school. It would greatly benefit the total body of knowledge to know for which demographics of teachers and work locations MBSR interventions are most effective. Does this specific type of intervention work best for veteran teachers or for young teachers? Does it work best for White teachers or teachers of color? Does it work best for STEM teachers or non-STEM teachers? All of these questions are yet unanswered, and but could be answered with future research. Additionally, one of the most surprising results from this study was the lack of correlation between a participant's fidelity score and their reduction in stress. Further research with a larger sample size could examine the validity of this relationship.

This study also recommends that more research must be conducted investigating mindfulness resistance. It is important to note that while there are a large number of peer-reviewed studies about the effectiveness of mindfulness (Breedvelt et al. 2019; Chi et al.,

2018; Khoury et al., 2015; Pascoe et al., 2017; Zhou et al. 2020), there have been few studies examining the causes that might stop people from completing a mindfulness intervention. The research suggests this is an effective stress reduction tool, so a logical next step is to determine why people are or are not using that tool. In future research, this study recommends also interviewing members of the control group to determine why they chose not to take part in the mindfulness intervention. Other research could explore if certain groups of teachers are more resistant to mindfulness work. Interviewees from this study suggested that men and STEM teachers might both be groups of teachers that are more naturally opposed to mindfulness work therefore it might be a question that warrants further exploration.

5.6 Summary

This study was significant because it generated local knowledge and reduced the stress of teachers at Glenmoore. As evidenced from the interviews, it changed many lives for the better. This study is also useful for guiding future decisions about stress and mindfulness at Glenmoore. Finally, this study contributes to and expands a growing body of mindfulness research.

The data collected from this study supported and expanded the body of knowledge surrounding mindfulness research. Pretest survey data showed that the experimental and control groups started with statistically similar levels of stress. Despite a stressful year, teachers at Glenmoore had stress levels that were close to the national average for working adults. This result was surprising, and suggests that in addition to the stressors it faces, Glenmoore receives levels of support beyond that of the average secondary school. The posttest data showed that the self-guided, audio-based MBSR

intervention was an effective tool for stress reduction in teachers at Glenmoore, a finding that is not surprising as it is directly supported by the major body of mindfulness literature. The interviewees revealed that teachers demonstrated enhanced regulation, a finding that is directly supported by and supports the theoretical framework of this study. Interviews also uncovered major factors that may affect mindfulness completion, namely time, perceived legitimacy and discomfort. These findings contribute to and expand the mindfulness knowledge base, as very little research has previously been done in this area. Finally, the study found that participants had very low participation fidelity, and that the amount of mindfulness exercises they completed was not a predictor of their change in stress. This was a surprising result that also expanded the knowledge base of mindfulness research as very few mindfulness studies include participation data.

Based on the results and findings of this study, specific recommendations for practice were made. This study recommended the expansion and modification of the MBSR intervention for teachers at Glenmoore through a specific professional development explicitly targeting the areas of resistance for mindfulness work. The professional development must first address the perceived legitimacy of this mindfulness intervention, then address the time concerns, and finally the discomfort associated with completing mindfulness work. Additionally, the MBSR intervention must be modified to make it more sustainable for teachers by making it less time intensive. As teachers at Glenmoore were able to get results without completing the full program, such a modification should still leave MBSR intervention an effective stress reduction tool.

This study had limitations. As with most studies on mindfulness, this the sample size of this study was too small to draw generalized conclusions about the effectiveness

of the intervention for all teachers. In addition, there may have been some selection bias in the sorting of the experimental and control groups. The positionality of the researcher may have unknowingly influenced the interview outcomes, and the self-reporting of participants may have resulted in some discrepancies in data collection. Additionally, the study was conducted during the COVID-19 pandemic, a unique occurrence which may have affected the results of the study in unprecedented ways. Finally, even though action research is the best tool available to researchers to generate local knowledge, the findings of such research are rarely generalizable on a wider scale.

Research on mindfulness interventions for teachers must continue. First, it was recommended that further research is conducted in other high schools with different backgrounds so that a wider sample of data could be collected. This would allow researchers to determine if there were specific groups of people for which the MBSR intervention would be especially effective. It was also recommended that future studies examine the link between participation fidelity and stress reduction, as this study's findings warrant further exploration. Lastly, it was suggested that future research focus on mindfulness resistance. There are a large number of staff members who are unwilling to engage with mindfulness work, and the root causes of this resistance should be further explored. This study showed that MBSR can be an effective tool for stress reduction, but it is only the first step in figuring out how to best hone that tool and deliver it to teachers.

Teaching is a difficult and stressful profession. Teachers are continuously over-worked, underpaid, and exposed to trauma both in their personal lives and in the lives of their students. Not only are they thrown into these harsh waters, but they are never taught how to swim. Current teacher education programs do not give teachers the proper tools to

deal with stress and trauma. Too many teachers are simply exposed to the elements of education and burnout. This should not be. While there are many broad scale changes in education that might reduce teacher stress—such as higher pay, increased work resources, and decreased job demands (Greenberg et al., 2016)—these changes require significant resources and may therefore never happen. More and more, teachers are being asked to do more with less. Currently, the United States spends only 11.6% of its public funding toward education, well below the 15% international standard (Hanson, 2022).

The job is not going to get any easier. Therefore, schools and school districts have a moral responsibility to better prepare their teachers for the stressful environments in which they must work. If mindfulness helps to reduce teacher stress, then schools should provide teachers with an opportunity to engage with mindfulness work during the day. In addition to offering professional development that trains teachers in mindfulness work, teachers should be given time throughout the day to institute mindfulness practices and to take care of themselves. Teachers with less stress create better learning environments. Better learning environments make better students. Better students help create a better world. Isn't that what it's all about?

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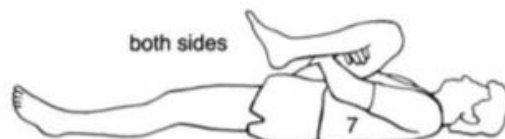
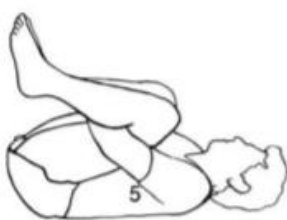
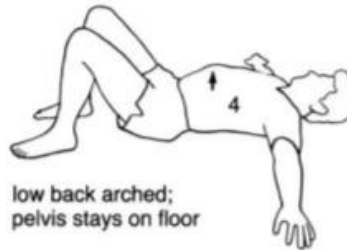
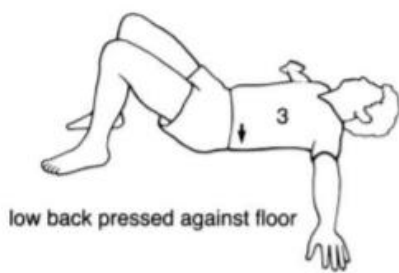
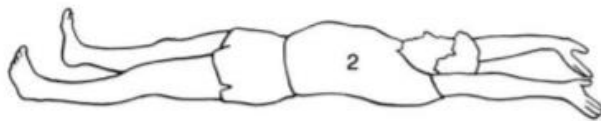
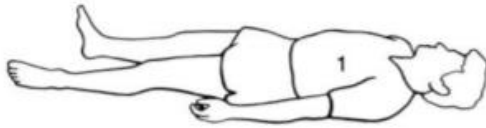
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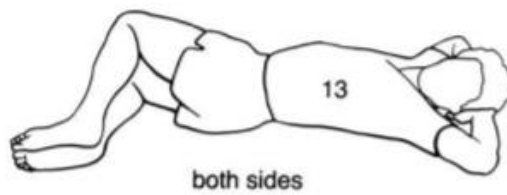
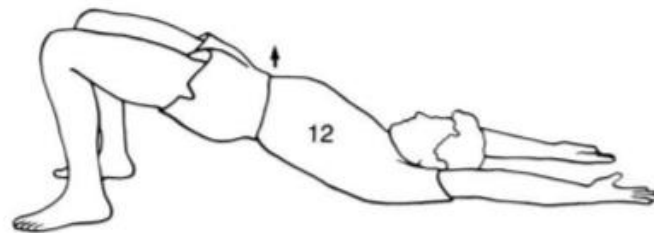
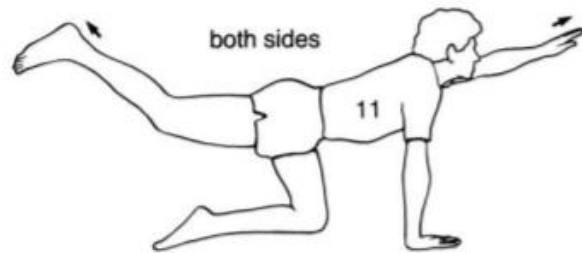
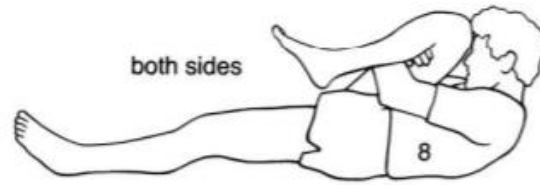
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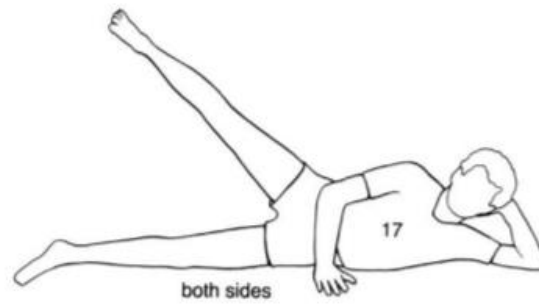
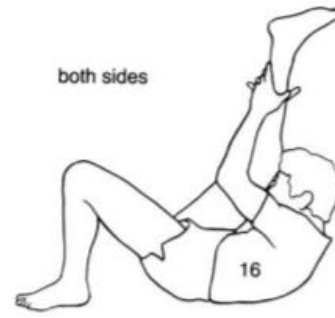
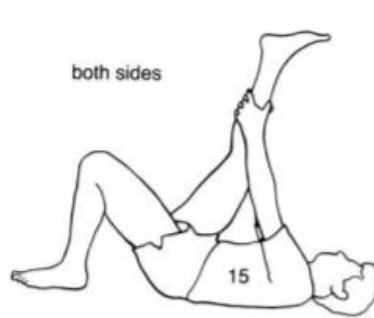
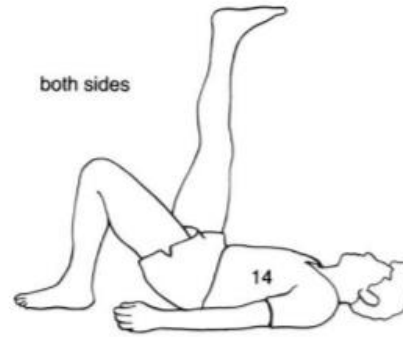
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APPENDIX A

MINDFUL YOGA 1 AND 2 POSTURES







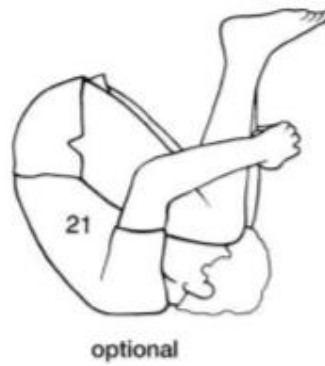
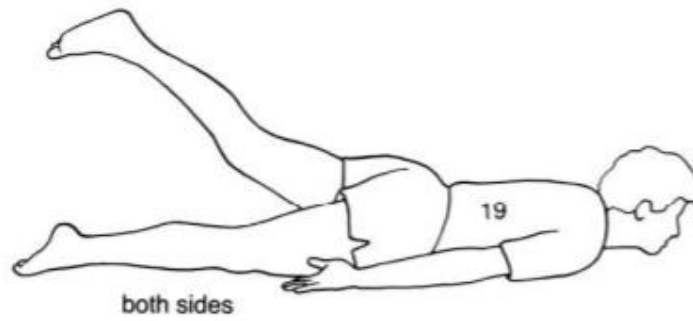
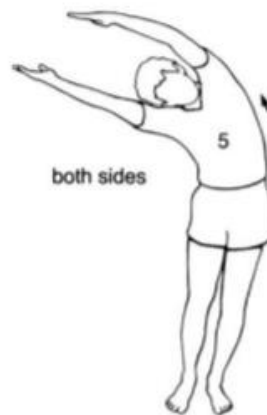
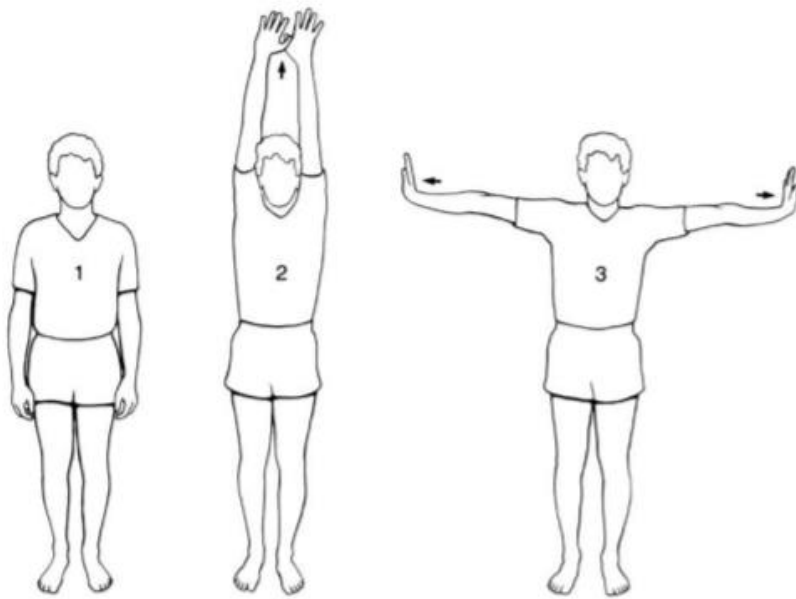
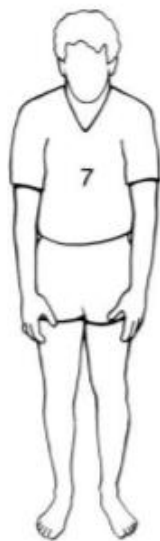


Figure A.1
Mindful Yoga 1 – Lying Down Meditations





raise up



squeeze together
in front

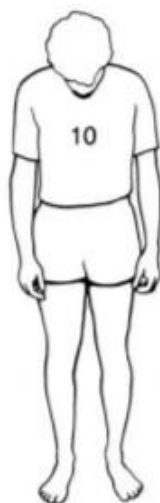


let drop

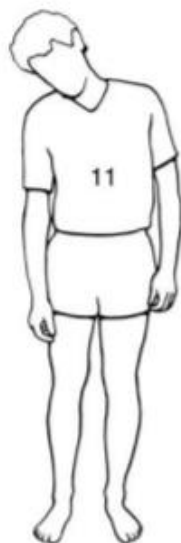


squeeze together
in back

neck rolls: do in one direction, then the other



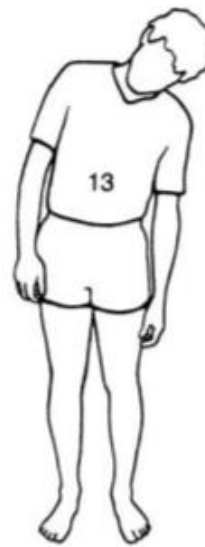
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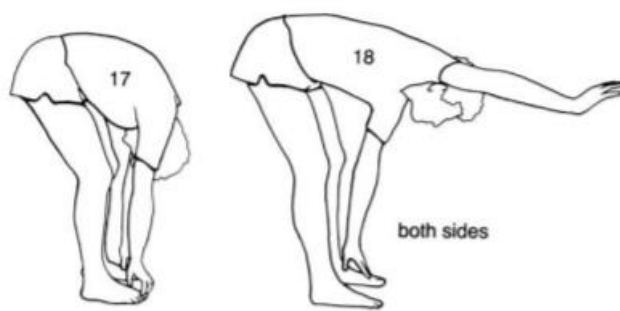
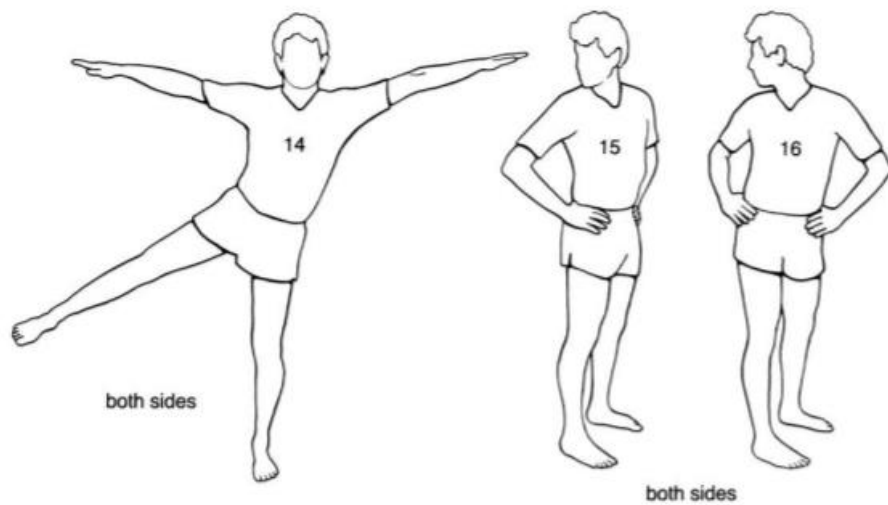
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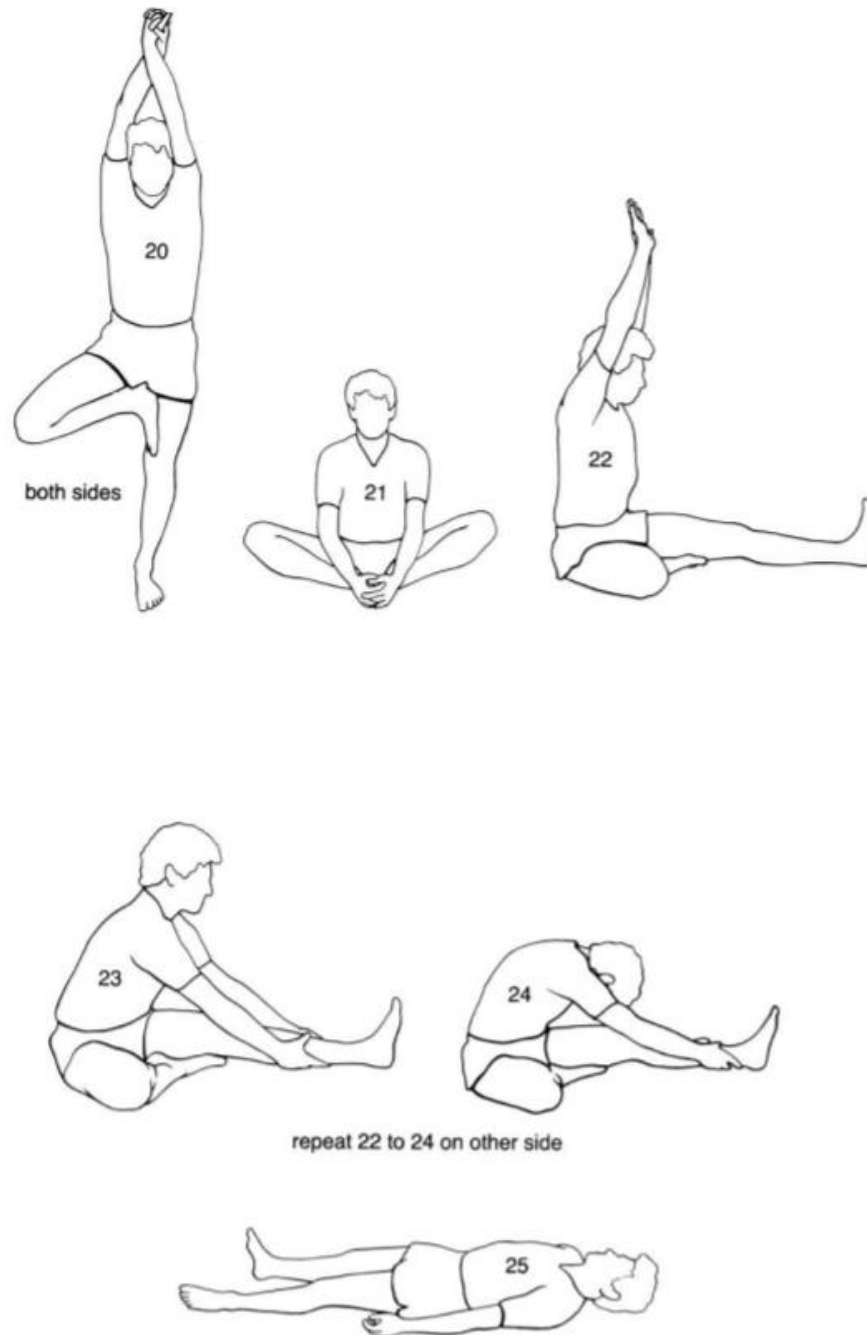


Figure A.2
Mindful Yoga I – Standing Meditations

All yoga images are from (Kabat-Zinn, 2013)

APPENDIX B

EXAMPLE CONSENT LETTER

Invitation to Participate in a Mindfulness Based Stress Reduction Study

Dear colleagues,

My name is Dylan Muzny. In addition to being a teacher at our school, I am also a doctoral candidate in the Education Department at the University of South Carolina. I am conducting a research study as part of the requirements of my degree in Curriculum Studies, and I would like to invite you to participate. I am funding this study out of my own pocket.

I am studying the effects of a Mindfulness Based Stress Reduction program on teacher stress. If you decide to participate, you will be asked to complete a pretest and posttest survey about your own stress levels. This survey will take about 15 minutes to complete. If you would like to be a part of the experimental group, you will also be asked to complete the Mindfulness Based Stress Reduction program. This requires 45 minutes of mindfulness practice a day for eight weeks, completed at home anytime that works best for you. You will be asked to track your progress on a log.

In particular, you will be asked questions about stress. You may feel uncomfortable answering some of the questions. You do not have to answer any questions that you do not wish to answer. The meetings to complete the surveys will take place at a mutually agreed upon time and place, and should last about 15 minutes each time. The surveys will only be reviewed by me and destroyed upon completion of the study.

Participation is confidential. Study information will be kept in a secure, locked location. The results of the study may be published or presented at professional meetings, but your identity will not be revealed. Participation is anonymous, which means that no one (not even me) will know what your answers are. So, please do not write your name or other identifying information on any of the study materials. You will receive a 10 dollar gift card for participating in the study.

I will be happy to answer any questions you have about the study. You may contact me at (303) 579-0506 or at dmuzny@email.sc.edu or you may contact my faculty advisor, Terrance McAdoo, at (803) 777-5129 or tmcadoo@mailbox.sc.edu.

Thank you for your consideration. If you would like to participate, please indicate below. If you have any questions you can reach me at the contact information below.

☐ I would like to participate in the study as a member of the control group, only completing the pretest and posttest survey.

☐ I would like to participate in the study as a member of the experimental group, completing the pretest and posttest survey, as well as the daily mindfulness practice and the participation log.

With kind regards,

Dylan Muzny

Dylan Muzny
1515 Greenbriar Blvd.
Boulder CO, 80305
(303) 579-0506
dmuzny@email.sc.edu

Printed Name

Signature

Date

Figure B.1

Example Consent Letter

APPENDIX C

PARTICIPATION LOG

Participant Number _____

Participation Log

As a member of the experimental group, you will be undergoing the Mindfulness Based Stress Reduction program. You will use this log to track your participation throughout this process. On each day, simply indicate to what extent you completed the mindfulness activity. On choice days, please indicate which mindfulness activity you chose to complete. There are no right or wrong answers. This form is simply to gather information about participation fidelity.

<i>Week</i>	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
<i>1</i>	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan
<i>2</i>	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan	Body Scan
<i>3</i>	Body Scan	Mindful Yoga 1	Body Scan	Mindful Yoga 2	Body Scan	Mindful Yoga 1
<i>4</i>	Body Scan	Mindful Yoga 2	Body Scan	Mindful Yoga 1	Body Scan	Mindful Yoga 2
<i>5</i>	Sitting Meditation	Mindful Yoga 1	Sitting Meditation	Mindful Yoga 2	Sitting Meditation	Mindful Yoga 1
<i>6</i>	Sitting Meditation	Mindful Yoga 2	Sitting Meditation	Mindful Yoga 1	Sitting Meditation	Mindful Yoga 2
<i>7</i>	Self-directed Practice	Self-directed Practice	Self-directed Practice	Self-directed Practice	Self-directed Practice	Self-directed Practice
<i>8</i>	Choice	Choice	Choice	Choice	Choice	Choice

Figure C.1
Participation Log

APPENDIX D

INSTRUCTIONS PROVIDED TO EXPERIMENTAL GROUP

Mindfulness Based Stress Reduction (MBSR)

From Full Catastrophe Living, by Jon Kabat-Zinn:

“MBSR is based on rigorous and systematic training in mindfulness, a form of meditation originally developed in the Buddhist traditions of Asia. Simply put, mindfulness is moment-to-moment non-judgmental awareness (Kabat-Zinn, 2013). It is cultivated by purposefully paying attention to things we ordinarily never give a moment’s thought to. It is a systematic approach to developing new kinds of agency, control, and wisdom in our lives, based on our inner capacity for paying attention and on the awareness, insight, and compassion that naturally arises from paying attention in specific ways...

All of us have the capacity to be mindful. All it involves is cultivating our ability to pay attention in the present moment as we suspend our judgment or at least, as we become aware of how much judging is usually going on within us...One way to think of this process of transformation is to think of mindfulness as a lens, taking the scattered and reactive energies of your mind and focusing them into a coherent source of energy for living, for problem solving, and for healing...

As you embark on your own journey of self-development and discovery of your inner resources for healing and for working with the full catastrophe, all you need to remember is to suspend judgment for the time being—including any strong attachment you might have to a desired outcome, however worthy and desirable and important it may be—and simply commit yourself to practice in a disciplined way, observing for yourself what is happening as you go along. What you will be learning will be coming primarily from inside you, from your own experience as your life unfolds from moment to moment, rather than from some external authority, teacher, or belief system. Our philosophy is that you are the world expert on your life, your body, and your mind, or at least you are in the best position to become that expert if you observe carefully. Part of the adventure of meditation is to use yourself as a laboratory to find out who you are and what you are capable of. As the legendary New York Yankees catcher Yogi Berra Once Put it in his unique and charmingly quirky way, “You can observe a lot by just watching.”

This MBSR course is intended to follow the mindfulness intervention laid out by Jon Kabat-Zinn in the book Full Catastrophe Living. It provides additional insight and context for this program. I cannot recommend it enough. If you have any more questions, please don’t hesitate to ask.

[Here](#) is a link to excerpts of chapter 2 of the book, which provides the foundations for your mindfulness practice.

[Here](#) is the link to the schedule and participation log. Please make a copy and then use it to track your progress.

The Body Scan

The body scan is about raising awareness of the body. This awareness becomes a focal point for mindfulness practice.

Just listen to the recording and follow the instructions.

While the body scan is meant to be a mindful practice, some people find it to be quite relaxing and use it to help themselves fall asleep. This is fine, but at least some of your body scans should be practiced while you are alert.

The body scan meditation is found [here](#).

Your benefits will directly correlate with your practice. The more time you are able to dedicate to your practice the more you will get out of the process.

Some people prefer to practice in the morning or at night, or on their commute to work. Find anytime that works best for you.

Sitting Meditation

From [Full Catastrophe Living](#):

“The basic instructions for practicing the sitting meditation are very simple. We observe the breath as it flows in and out. We give full attention to the *feeling* of the breath as it comes in and full attention to the *dwelling* of the breath as it goes out... And whenever we find that our attention has been carried elsewhere, wherever that may be, we simply note it, then let go and gently escort our attention back to the breath, back to the rising and falling of our own belly.

If you have been trying it, perhaps you will have already noticed that your mind tends to move around a lot. You may have contracted with yourself to keep your attention focused on the breath no matter what. But before long, you will undoubtedly find that the mind is off someplace else. It has forgotten the breath; it has been drawn away.

Each time you become aware of this while you are sitting, the instruction is to first note briefly what is on your mind or what carried you away from attending to the breath, and then to gently bring your attention back to your belly and back to your breathing, no

matter what carried it away. If it moves off the breath a hundred times, then you just calmly and gently bring it back a hundred times.

By doing so, you are training your mind to be less reactive and more stable. You are making each moment count. You are taking each moment as it comes, not valuing any one above any other. In this way you are cultivating your natural ability to concentrate your mind. By repeatedly bringing your attention back to the breath each time it wanders off, concentration builds and deepens, much as muscles develop by repetitively lifting weights. Working regularly with (rather than struggling against) the resistance of your own mind builds inner strength. At the same time you are also developing patience and practicing being non-judgmental. You are not giving yourself a hard time because your mind wandered away from the breath. You simply and matter-of-factly return it to the breath, gently but firmly.”

[Here](#) is the link to the sitting meditation

Mindful Yoga 1 and 2

From [Full Catastrophe Living](#):

“Yoga is a Sanskrit word that literally means “yoke”. The practice of yoga is the practice of yoking together or unifying the body and mind, which really means penetrating into the experience of them not being separate in the first place. You can also think of it as experiencing the unity or connectedness between the individual and the universe as a whole. The word has other specialized meanings, which do not concern us here, but the basic thrust is always the same: realizing connectedness, non-separation, integration—in other words, realizing wholeness through disciplined practice...

Every time you intentionally assume a different posture, you are literally changing your physical orientation, the carriage of your body, and therefore your inner perspective as well. So, you can think of all the positions in which you find yourself while doing yoga as opportunities to practice mindfulness of your thoughts, feelings and mood states as well as of your breathing and the sensations associated with stretching and lifting different parts of your body. After all, it is always the same awareness, whether you are moving or still, using one practice or another. In some sense, the various formal practices of MBSR, including the yoga postures, are all different doors into the same room. Feel free, therefore, to skip certain postures if they aren't appropriate for you. You can always come back to them later. Remember, this is potentially a lifetime engagement—if for no other reason than because your relationship with your body certainly is...

When you practice the yoga, you should be on the lookout for the many ways, some quite subtle, in which your perspective on your body, your thoughts, and your whole sense of self can change as you are drawn to adopt different postures and stay in them for a time, paying full attention from moment to moment. Practicing in this way enriches the inner work enormously and takes it far beyond the physical benefits that come naturally with the stretching, strengthening, and balancing. In my experience, this kind of gentle mindful yoga is a lifetime practice. It is a veritable laboratory in which to get to

know your body in ever deeper ways. When it is approached with ease and respect for your body as the final arbiter of what you should be doing on any particular day (with input from your doctor, if that is appropriate, and from a yoga teacher if you have one), it can yield rich ongoing revelations as we grow older.”

[Link to Yoga 1](#), the lying down yoga sequence

[Link to Yoga 2](#), the standing yoga sequence

[Link](#) to pictures of the yoga positions

Self-Directed Practice

From [Full Catastrophe Living](#):

“To encourage self-directed practice and increasing self-reliance, week 7 of MBSR is dedicated to practicing without the CDs for guidance if at all possible. People devote a total of forty-five minutes a day to a combination of sitting, yoga, and body scanning, but they have to decide on the mix themselves. They are encouraged to experiment, perhaps by using two or even three of the different practices together on the same day, say thirty minutes of yoga followed by fifteen minutes of sitting, or twenty minutes of sitting followed by yoga either right after it or at another time of the day entirely.

Some people find they do not feel ready for practicing in this way at this point. They prefer to continue using the CDs. They find the guidance comforting and reassuring and are better able to focus and to rest in awareness in a relaxed and spacious way when it is not up to them to decide what to do next, particularly in the body scan and the yoga. For our point of view this is not a problem. Our hope is that with time you will internalize the practice and be comfortable practicing on your own, without the CDs or books for guidance. However, the development of this kind of confidence and faith in your capacity to guide yourself in the meditation does take time, and it varies from one individual to another. Many of our patients can meditate quite well on their own but still prefer to us the CDs, even years after they complete the program.”

Choice

From [Full Catastrophe Living](#):

“In week 8 of MBSR, we come back to the CDs. Leaving them in week 7, to whatever degree we can manage to practice on our own, and then coming back to them in this way can be quite revealing. You are likely to hear things on the CDs that you never heard before and to perceive the deep structure of the meditation practice in new ways. In this week, you are encouraged to practice with the CDs even if you prefer doing it without them. But now *you* are in charge of deciding what practice or practices you wish to engage in. You may just be practicing the sitting meditation or the yoga or the body scan, depending on your situation, or you may be combining two or all three in various ways, and including formal walking meditation practice as well.

At this point in the development of your mindfulness practice, it is important for you to recognize that you now have at least some familiarity, if not intimacy, with all four of the formal mindfulness practices of MBSR. You are likely to find this familiarity beneficial in very practical ways, for you now have a knowledge base to call upon in particular circumstances. For instance, you may find yourself drawn from time to time to practice the yoga or the body scan even if your daily practice is mainly sitting. What is more, the body scan can be particularly useful when you are sick in bed, in acute pain, or unable to sleep. Likewise, a little mindful yoga can be particularly helpful at certain times, such as when you are very tired and need to revitalize yourself, when there is stiffness in particular regions of your body, or when you happen to find yourself in a particularly beautiful spot in nature where the conditions are just right, nobody is around, and the freshness of the air is calling you to drop into a yoga pose and hold it in this very instant.”

Figure D.1

Instructions Provided to the Experimental Group

APPENDIX E

INTERVIEW PROTOCOL

Basic information about the interview

Time and Date:

Location:

Interviewer:

Interviewee:

Introduction

- Thank them for being here and agreeing to do this interview
- Introduce myself
- Explain purpose of the study
- Talk about the general structure of the interview
- Ask them “Do you have any questions?”

Opening questions

How are you doing?

Do you have any plans coming up?

Content questions

What prompted you to agree to participate in this study?

What were you hoping to get out of this process?

How familiar are you with mindfulness work?

Suppose you were talking to someone who had no experience with mindfulness. How would you describe mindfulness to them?

What does stress feel like to you?

What challenges did you encounter while completing this program?

What changes (if any) have you noticed since participating in this study? *Be careful not to lead.*

At what point did you recognize or perceive any difference in your stress level? (note the opportunity for follow-up discussions here)

What are your major “take aways” from this process?

Would you at some point use any of the techniques/strategies of this project with your students?

Moving forward, are you planning on continuing a mindfulness practice? Why or why not?

Why do you think it is that some teachers are resistant to mindfulness work? Have you shared any of this resistance?

Is this a program you would recommend to other teachers?

What do you think your ideal stress reduction intervention would look like?

Is there anything else you would like to say to me about this process?

Potential probes

“And why is that?”

“Why do you think that is?”

“Can you explain that a little more?”

“What exactly does that mean to you?”

“Can you provide any more detail?”

Closing instructions

- Thank them for their time
- Ask “Do you have any final questions for me?”
- Remind the interviewee that they will be anonymous
- Ask if I can do a follow up interview if needed
- Explain to the interviewee how they will see the results of the study.

Figure E.1

Interview Protocol