The relationship between an online mindfulness intervention and academic achievement, attendance, behavior, and social-emotional growth in 9th grade students

by

Jana Lauren Biery

B.A., Kansas State University, 2009
B.S., Kansas State University, 2010
M.S., Kansas State University, 2015

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Special Education, Counseling and Student Affairs
College of Education

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Manhattan, Kansas

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Abstract

The challenges facing adolescents today are greater than ever. It is imperative that students have the social and emotional skills to help them succeed. Mindfulness helps support social, emotional, and academic learning as it assists children in becoming more self-aware and builds self-regulation. Mindfulness is about being present within yourself as well as within your environment. A review of the literature provided evidence supporting the feasibility and effectiveness of mindfulness-based interventions for adolescents. Fully present teachers and students can experience strong emotion management and stress reduction, which in turn can lead to improved attention, positive academic outcomes, reduced behavior problems, and an increased enthusiasm for learning. This quasi-experimental study examined the relationship between a whole school online mindfulness intervention and student academic performance, attendance, behavior and social emotional growth at one midwestern high school. The researcher collected student aReading and aMath test scores, attendance percentages, number of discipline referrals, and mySAEBRS scores from a fall semester during which an online mindfulness intervention was being utilized from the following fall semester. Using one-way ANOVAs and two proportion z tests, the findings revealed statistically significant differences for behavior referrals and social-emotional growth between the years with and without the online mindfulness intervention.

Keywords: Mindfulness, online-mindfulness intervention, mental health, social-emotional growth , academic achievement, behavior, attendance, high school

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Approved by:

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Dr. Judith Hughey

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Dedication

Some Moms Part 2

Some moms made elaborate scrapbooks
Some moms kept immaculate houses
Some moms gave all kinds of freedoms
Some moms were beautiful
But I had my mom. And
My mom loved words in all forms.
Books to read, poetry to devour.
Long, long conversations.
My mom wrote a book of poems for me,
A way to capture my senior year.
And I wrote this for her because I do remember
In my free moments and
I wanted a way to mark with words the beauty
Of this life.

To my mom, one more way to say
"I Love you."

Chapter 1 - Introduction

According to the National Institute of Mental Health (2017), an estimated 31.9% of adolescents have an anxiety disorder 8.3% of adolescents diagnosed meet the DSM-5 criteria of severe impairment. These statistics show a high prevalence of adolescents struggling with anxiety, and these statistics do not include the non-clinical population or those living with undiagnosed anxiety disorders. The Child Mind Institute claims in their 2018 Children's Mental Health Report that at some point, anxiety affects 30% of children and adolescents, yet 80% never get help. The National Alliance on Mental Illness states that of those children and adolescents diagnosed, "just over half (50.6%) of children with a mental health condition aged 8-15 received mental health services in the previous year"(National Alliance on Mental Illness, 2018).

There are severe and impactful consequences of leaving anxiety untreated. Adolescents suffering from anxiety disorders are at increased risk for a multitude of factors that could negatively influence their ability to be successful both academically and psychologically (Schwarz, 2009). Untreated anxiety disorders increase the risk for depression, school failure, substance abuse, and difficulty transitioning to adulthood (Child Mind Institute, 2018). Children with anxiety disorders have an increased risk of performing poorly in school, missing out on meaningful social experiences, and engaging in substance abuse (Bamber & Kraenzle Schneider, 2016). As these claims show, the consequences of not providing interventions for children and adolescents with anxiety could be very severe. As public schools move to a post-COVID-19 world, there is an increased need for preventative, proactive interventions to help students cope with anxiety (Reinert et al., 2021).

There are a variety of treatment modalities widely accepted for anxiety disorders; among these are therapeutic interventions that utilize mindfulness. Mindfulness interventions have

contributed positively to children's perceived stress levels, reduced stress and anxiety, provided more productive ways to deal with stress. Research shows that improvements were seen in academic functioning, internalizing problems, externalizing problems, and emotional regulation (Bamber & Krenzle Schneider, 2016; Costello & Lawler, 2014; Semple et al., 2005).

This chapter includes the background and significance of school-based mindfulness interventions with adolescents. The chapter also consists of research questions, hypotheses, and the rationale for the study, as well as definitions of terms, assumptions, limitations, and current gaps in the literature.

Background

While the nationwide statistics of the state of youth mental health are concerning and eye-opening, the state of Kansas is no different. According to the *Kansas Communities that Care* data, students showed increased levels of depression and conflict from 2018 to 2019, and approximately 37% of Kansas youth were at risk of academic failure in 2019 (Kansas Communities that Care, 2019). Tasked with finding preventative systemic ways to meet students' social-emotional needs effectively, Kansas schools have been looking for school-wide interventions. Mindfulness is one such supported intervention.

Since the introduction of mindfulness into mainstream therapy by Jon Kabat-Zinn in 1979, there has been an increase in clinical interventions involving training clients in mindfulness skills. From 2000 to 2016, there were 142 studies published on using mindfulness as a clinical intervention (Goldberg et al., 2017). That number has grown considerably as publications on mindfulness have increased dramatically in the recent decade (Zhang et al., 2021). In a systemic review of the mindfulness literature, Zhang et al. (2021), found that the number of publications on mindfulness is starting to be more comparable to the number of

publications on cognitive behavioral therapy (CBT). With the increased enthusiasm in mindfulness research, there is also an exploration of the application of mindfulness in various settings with various populations (Cebolla et al., 2017; Chung et al., 2018; Colzato et al., 2017; Costello & Lawler, 2014; Crescentini et al., 2016; Flook et al., 2015; Garland & Fredrickson, 2019; Henriksen et al., 2020). While the body of research on mindfulness is continuously growing, there is still a need for further exploration in mindfulness practice with adolescents (Beauchemin et al., 2008; Britton et al., 2014). There is much research on mindfulness in the adult population, but significantly less research shows the effects on children and adolescents (Biegel et al., 2009).

Many of the interventions used for children and adolescents were developed for adult populations and modified to be more developmentally appropriate for the child and adolescent population. These modifications involve shortening the length of the session, using more repetition, and modifying vocabulary (Zoogman et al., 2014). There is a large body of work on the appropriateness of these modified interventions and numerous studies showing promising results concerning the efficacy of such interventions (Baer, 2003; Dove & Costello, 2017; Goldberg et al., 2017; Singh & Gorey, 2018). Both Himelstein et al. (2012) and Monshat et al. (2013) noted that very few studies had investigated the effect of mindfulness programs on adolescent populations. Much of the research that exists focuses on clinical applications of mindfulness, and there is limited research regarding mindfulness programs in high school settings (Bluth & Blanton, 2014; Carsley et al., 2017; Erbe & Lohrmann, 2015; Felver et al., 2015; McKeering & Hwang, 2018; Zenner et al., 2014).

Also worth consideration is the issue that many adolescents are not receiving mental health treatment. Providing interventions through the school setting is a practical way to work

with numerous adolescents in a non-clinical environment. In addition to the convenience of delivering interventions through the school day, there are various positive aspects to placing mental health interventions within the school system. One of which is that doing so may reduce the stigma of receiving mental health services (Britton et al., 2014). These same authors discuss that the stigma surrounding mental health services has been a common reason youth do not seek mental health support. This stigma lessens by incorporating mindfulness interventions in the classroom and school environment. There is an opportunity for students and teachers to discuss mental health as part of their daily routine (Britton et al., 2014).

Through the expansion of Social Emotional Learning (SEL) in education, schools have begun incorporating mindfulness practices and mindfulness-based strategies into classroom SEL lessons. The goals are to help students develop healthy relationships, self-awareness, self-appreciation, self-efficacy, and self-management (Sampiano de Carvalho et al., 2017; Greenberg & Harris, 2012; Semple et al., 2017; Weare, 2012). While adding interventions to a school day seems like a relatively simple change, adding more things to a school schedule is often challenging. In that vein, studies have looked at the acceptability of school-based interventions to the school, teachers, and students. These studies have found an overwhelmingly positive reaction to the interventions and have found that they are feasible to the students, teachers, and administrators (Bamber & Kraenzle Schneider, 2016; Dove & Costello, 2017; Mendelson et al., 2010).

When schools have implemented mindfulness programs and practices, the interventions are often delivered face-to-face and require that teachers be trained or experienced in mindfulness (Crane, 2017). Studies show that the training cost for teachers in a mindfulness training program ranged from $515 to $1850 per teacher depending on the number of teachers

being trained and the ancillary and opportunity costs (Doyle et al., 2019). The increase in online/technology applications of mindfulness programs presents schools with a unique opportunity to access mindfulness practices in a new way. These web-based mindfulness interventions have also shown effectiveness in reducing depression and anxiety among people diagnosed with anxiety disorders as well (Sevilla-Llewellyn-Jones et al., 2018).

Research Problem

While many of these online mindfulness applications have promoted changes in wellbeing (McKay et al., 2016), there is still little research evaluating these applications (Daudén Roquet & Sas, 2018). There have been preliminary benefits seen in the research on online mindfulness interventions, but more studies are needed to understand if online alternatives have equal or better effects and cost-effectiveness (Sevilla-Llewellyn-Jones et al., 2108; Spijkerman et al., 2016; Toivonen et al., 2017). Owing to this gap in the literature (Carsley et al., 2017; Daudén Roquet & Sas, 2018; Felver et al., 2015; McKeering & Hwang, 2018; Semple et al., 2017; Zenner et al., 2014), there was a need to explore further online mindfulness interventions with high school students. Increasing our knowledge of adolescents' mindfulness practice and the impacts hold potential future benefits for students and schools alike.

Purpose Statement

The purpose of this study was to examine if a relationship existed between student academic performance, attendance, behavior, social-emotional growth, and the utilization of an online mindfulness intervention in Midwestern High School students.

Research Questions

For this study, student data were collected in the fall of 2020 and the fall of 2021. An online mindfulness intervention, My Life for Schools, was used by students during the fall of 2020. With this context, the research questions addressed by this study were the following:

1. Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021?
2. Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021?
3. Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021?
4. Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021?

Research Hypotheses

The researcher used an ex post facto design with archival aMath, aReading, Social Emotional Behavior Risk Screener (MySAEBRS), attendance, and behavior referral data. The data were collected from the fall semester of the 2020-2021 school year during which the online mindfulness intervention was taking place and the fall semester of the year following the intervention (school year 2021-2022) to conduct one-way ANOVAs to answer research questions one and two, and two-proportion z tests to answer research questions three and four.

RQ1: Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021?

$H1_{o}$: There is no statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021.

$H1_a$: There is a statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021.

RQ2: Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021?

$H2_o$: There is no statistically significant difference between students' attendance in Fall 2020 and Fall 2021.

$H2_a$: There is a statistically significant difference between the attendance of the students in Fall 2020 and Fall 2021.

RQ3: Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021?

$H3_o$: There is no statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021.

$H3_a$: There is a statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021.

RQ4: Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021?

$H4_o$: There is no statistically significant difference between the MySAEBRS scores for students in Fall 2020 and Fall 2021.

$H4_a$: There is a statistically significant difference between the mySAEBRS scores for students in Fall 2020 and Fall 2021.

Rationale and Significance of the Study

This quantitative study used one-way ANOVAs and two proportion z tests to determine if a relationship existed between student academic performance, attendance, behavior, and social-emotional development and the utilization of an online mindfulness intervention.

The first research hypothesis for this study was that there would be a statistically significant difference in academic achievement as measured by aReading and aMath test scores between the year when students were using MyLife for Schools and the year they were not. This hypothesis was based on research that indicates that mindfulness training in an educational setting positively affects student academic achievement (Franco et al., 2010; Knepper, 2015; Lawlor, 2014; Troyer et al., 2012).

Caballero et al. (2019) showed a correlation between greater levels of mindfulness and fewer absences (p. 4). This research supports the second hypothesis for this study, which was that there will be a statistically significant difference in student attendance during the year that students were using MyLife for Schools and the year they were not.

The third research hypothesis for this study was that there will be a statistically significant difference in student behavior as indicated by discipline referrals between the Fall of 2020 when students were using MyLife for Schools and the Fall of 2021, when they were not utilizing online mindfulness. This hypothesis was based on prior research connecting mindfulness programs with increased positive student behavior (Black & Fernando, 2014; Butzer et al., 2015; Butzer et al., 2016; Flook et al., 2013; Martinez & Zhao, 2018).

The fourth research hypothesis for this study was that there will be a statistically significant difference in students' social and emotional growth as measured using the mySAEBRS scores between the students using MyLife for Schools during the Fall of 2020 and

the students who were not using this program during the Fall of 2021. Mindfulness programs have been shown to positively correlate to improved emotional intelligence in various studies (Black & Fernando, 2014; Bluth & Blanton, 2014; Helmer, 2014; Hill & Updegraff, 2012) further supporting the hypothesis.

The potential implications for the information gained from this study are of particular importance to school districts interested in implementing school-wide mindfulness using an online approach. This study also contributed to the limited literature related to mindfulness practice in adolescents and online mindfulness interventions.

Nature of the Study

The nature of the study focused on evaluating the relationship between the online mindfulness application, MyLife for Schools, and the academic performance, attendance, behavior, and social-emotional growth of high school students. The researcher studied growth from fall to winter in aReading and aMath and mySAEBRS scores, attendance, and behavior referral data between students who participated in an online mindfulness intervention during the fall of 2020 and those who did not in the fall of 2021. The study was conducted in one high school building that serves only 9th grade, located in the Midwest. The study utilized the results of the school's data from the fall semesters of the 2020-2021and 2021-2022 school years. Ex post facto design was used and archival scores from all 9th-grade students were collected for the fall semester of the 2020-2021 and 2021-2022 school year. The analysis of variables revealed the significance of student outcomes. The analysis of data utilizing SPSS and Microsoft Excel uncovered the statistical and practical significant difference in the effect of the online mindfulness application and its relationship with adolescent academic performance, attendance, behavior, and social-emotional growth.

The online application used for this study was a web-based program called MyLife for Schools. MyLife for Schools is a mindfulness tool that provides guided meditations and mindfulness activities to promote self-awareness.

MyLife for Schools creators launched a school initiative that provided selected pilot schools with unlimited free access to the product (See Appendix A). The research site was one of the schools selected to participate in the pilot program. The meditation programs were developed by mindfulness experts and a scientific advisory board with many years of practice (MyLife, 2018). The use of MyLife for Schools was based solely on the availability due to the school's participation in the pilot program and was not a product evaluation.

Students were prompted daily to log in and do a mindfulness activity by their teachers. Once logged in, the application prompted users to provide an emotional, mental, and physical check-in before and after the meditation and mindfulness activities. The app then provided suggestions for specific meditation and mindfulness activities. The user could choose from among the suggested one to ten-minute activities or search and pick one of their choosing (MyLife, 2018).

The research sample for this study was ninth-grade students in a Midwest high school. The approximate sample size was 500 students during the 2020-2021 school year and around 550 students in the 2021-2022 school year. Table 1 outlines the selected high school student demographics.

Table 1.1 Sociodemographic Characteristics

Sociodemographic Characteristics of Participants at Baseline

Baseline characteristic	Fall 2020		Fall 2021	
	n	%	*n*	%
Gender				
Female	210	43	271	49.7
Male	276	57	274	50
Ethnicity				
American Indian	4	.82	4	.73
Asian	17	3.5	22	4.04
Black	36	7.4	42	7.7
Hispanic	60	12.14	97	17.8
Native Hawaiian	1	.21	1	.18
Multi-Ethnic	35	7.2	52	9.54
White	333	68.72	327	60
Economically Disadvantaged	217	44.65	284	52.11
Special Services				
ESOL	14	2.8	14	2.5
Special Education	114	23.5	118	21.6

The data collection for this study included archival data for student academic, attendance, behavior reports, and student self-reported mySAEBRS scores from the year of the mindfulness intervention (2020-2021) and from the year following (2021-2022). The school administrator provided the researcher with the attendance and behavioral data for 2020-2021 and 2021-2022. The district MTSS coordinator provided FASTBridge aReading and aMath scores. The researcher accessed the student mySAEBRS data for these same years. The Fall and Winter administrations of the FASTBridge aMath and aReading tests were used to measure academic performance. Attendance was measured using school attendance records and student behavior was measured using discipline referral data. The students' social and emotional development was measured using the mySAEBRS data from Fall and Winter administrations.

Definition of Terms

Mindfulness. Defined by Jon Kabat-Zinn, known as a founder of mindfulness work in the United States, is “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment"(Kabat-Zinn, 2003, p.145).

MyLife for Schools. MyLife for Schools is a web-based mindfulness application for the classroom developed for Middle and High School students. Students check in with their feelings, and MyLife recommends short mindfulness activities tuned to their emotions. The goal of the application is to decrease stress and anxiety, increase emotional regulation, build strong communication and support academic success (MyLife, 2018).

Discipline referral. Meador (2020) defined a discipline referral as “the process or steps taken by a teacher in order to get extra assistance for a student with whom they directly work” (para. 1).

Social-emotional learning (SEL). CASEL (2021-b) defined SEL as a process to attain and effectively employ knowledge, attitudes, and skills necessary to handle emotions, identify and realize goals, compassionately respond to others, develop and sustain positive relationships, and select sound, ethical decisions (para. 3).

Assumptions, Limitations, Delimitations

Assumptions are the premises or ideas that were presumed to be factual (Roberts, 2010). In this quantitative study, the assumptions were:

1. It is assumed that participants in this study were not deceptive with their mySAEBRS answers, and that they answered questions on their FASTBridge assessments to the best of their abilities.
2. It is assumed that the assessment proctors followed protocols and administered FASTBridge using ethical practices as they are intended to be administered.
3. It is assumed that the results of the assessments were an accurate measure of student ability.
4. It is assumed that students did the daily mindfulness activities with fidelity. To help ensure that this assumption was met, participant total activity times were tracked within the mindfulness program, and if students had not logged on the teachers and school counselors reminded them to participate.

Limitations to any study may potentially impact the results. Limitations are restrictions beyond the researcher's control that influence the interpretation or findings of a study (Theofanidis & Fountouki, 2018). The researcher does not have control over the limitations, however stating them explicitly may prevent misconceptions of the results of the study (Lunenburg & Irby, 2008).

The limitations of this study were:

1. There were factors such as student attendance that could have impacted the FastBridge assessment administration timelines.
2. Due to unforeseeable circumstances of the pandemic COVID-19, students were given the option to choose remote learning during the 2020-2021 school year. The data from the remote students are included in this study, but it is likely that the behavioral and attendance data were impacted.
3. The exact participation of students completing their online mindfulness activities is unknown, so this study was limited by participants' willingness to use MyLife for Schools.
4. The extreme impact on students as a result of the COVID-19 pandemic likely contributes to numerous confounding variables. To account for this, the researcher only used "post-COVID-19" data.

Delimitations refer to characteristics that arise from the researcher's decisions during the construction of the study (Theofanidis & Fountouki, 2018). These decisions are made in order to limit the focus and create specific boundaries for the study. The delimitations for this study were:

1. This study was quantitative in nature, the researcher did not seek qualitative data regarding the relationship between mindfulness and the dependent variables.
2. For the sake of convenience, the target population for this study was delimited to a single urban school district in the Midwestern United States that serves only 9th grade. It is possible that these students were not representative of adolescents in general.

3. Due to the COVID-19 pandemic, the research site school moved to remote learning in March 2019 before the initial rollout of the MyLife for Schools pilot program. The access to MyLife was then moved to the fall semester of the 2020-2021 school year.
4. The researcher chose not to include data from the 2019-2020 school year due to the impact of the COVID-19 pandemic.

Summary

Chapter 1 introduced the need to provide students with school-based mental health support. One potential support is online mindfulness interventions. The gap identified in previous work on mindfulness in school settings was that much of the research had focused on face-to-face interventions (Carsley et al., 2017; Daudén Roquet & Sas, 2018; Felver et al., 2015; Gouda et al., 2016; McKeering & Hwang, 2018; Zenner et al., 2014). Increasing knowledge of the effects of online mindfulness-based practices in adolescents holds numerous potential future benefits. The researcher hoped to gain valuable insight through examining MyLife for School's relationship with students' academic performance, attendance, behavior, and social-emotional development.

The following chapters present the remainder of this research. Chapter two is an extensive review of the literature on mindfulness, adolescent mental health, benefits of mindfulness, school-based mindfulness interventions, and online mindfulness platforms.

Chapter three provides an outline of the research design and a description of how the researcher implemented the design. It also expands on the research questions and hypotheses.

Chapter four provides a brief overview of the research questions and hypotheses. It presents the results of the ANOVA, and it shows descriptive statistics and preliminary statistical analysis, and it also includes statistical conclusions for accepted and rejected hypotheses.

Chapter five includes a comprehensive summary and discusses the implications of the results and relevant literature findings. This chapter addresses limitations more thoroughly and concludes with recommendations for future research.

Chapter 2 - Literature Review

Introduction to Chapter and Background to the Problem

Prior to the Covid-19 Pandemic, high school students were experiencing increasing rates of anxiety and stress (Richards et al., 2015). Now, according to the 2021 *Children's Mental Health Report: What we know about the COVID-19 pandemic's impact on children's mental health*, these mental health concerns are even more significant. Many teens surveyed said that the pandemic had impacted their mental health somehow, with 37% saying it had made their mental health worse (Osgood et al., 2021). There is a need to systemically and universally provide mental health support for adolescents. Schools are a universal access point to deliver early adolescents' health and wellbeing services (World Health Organization [WHO], 2017b). School-based programs effectively provide support for students and minimize mental health risks (Dray et al., 2014). Mindfulness-based interventions (MBIs) are an example of one intervention, which has shown to benefit and promote the health and wellbeing of school-aged students (Weare, 2013).

While the body of research on mindfulness is continuously growing, there is still a need for methodologically sound research in all areas of mindfulness, including the areas of school-based mindfulness and mindfulness as a treatment for adolescent anxiety (Beauchemin et al., 2008; Britton et al., 2014). Two different meta-analyses of mindfulness discuss the need to address the quality of research design. Baer found in 2003 that many studies had significant methodological weaknesses, which made it difficult to draw strong conclusions. These weaknesses included lack of control groups, small sample sizes, lack of treatment fidelity measures, and lack of training for treatment interventionists (Baer, 2003).

Another meta-analysis conducted in 2017 looked to identify an increase in the quality of the research. This analysis specifically looked at the six areas of weakness identified in Baer's work from 2003. This more recent meta-analysis found that "there was only modest evidence that the quality of mindfulness research has improved" (Goldberg et al., 2017, p.11).

There are therapeutic mindfulness-based interventions that have been successfully adapted for the use with a younger population, including Mindfulness-Based Cognitive Therapy for Children (MBCT-C; Semple & Lee, 2014), Mindfulness-Based Stress Reduction for Teens (MBSR-T; Biegel et al., 2009), and Acceptance and Commitment Therapy for Adolescents (ACT; Hayes et al., 2011). These efficacious interventions can be placed within schools if the school has a properly trained mental health provider.

Non-therapeutic, classroom-based mindfulness interventions effectively improve mental health and enhance wellbeing (Eklund et al., 2017; Parsons et al., 2017; Van Genugten et al., 2016; Waters et al., 2017). However, most of these non-therapeutic interventions are delivered face-to-face and still require some level of training for the teacher and planning and class time (Spijkerman et al., 2016). In educational settings, class time and teacher training are two constraints that hinder the implementation of traditional face-to-face mindfulness interventions (Zenner et al., 2014).

Still, school-based interventions are an acceptable, practical, and cost-effective way to reach numerous students at one time. Numerous researchers (Levin et al., 2014; Sevilla-Llewellyn-Jones et al., 2018; Spijkerman et al., 2016) have suggested that online mindfulness-based interventions are as effective as face-to-face interventions to reduce stress and anxiety. There is still a need, however, to evaluate the impact of online mindfulness-based interventions with adolescents in high school (Carsley et al., 2017; Daudén Roquet & Sas, 2018; Felver et al.,

2015; McKeering & Hwang, 2018; Semple et al., 2017; Spijkerman et al., 2016; Zenner et al., 2014). Based on this need, the potential benefits to students warrant further examination.

Knowing that there is still a need for quality research in online-based mindfulness applications with adolescents, this study specifically explored the literature in the following areas: the use of mindfulness, the mental health concerns of adolescents, the therapeutic approaches to mindfulness interventions with the adolescent population, the use of school-based mindfulness interventions, the impacts of mindfulness interventions, and online mindfulness-based platforms and applications.

Theoretical Framework

The theoretical orientation for this study was based on Cognitive Behavioral Therapy (CBT). CBT is mainly attributed to Aaron Beck, the father of Cognitive Therapy, and Albert Ellis, the founder of Rational Emotive Behavior Therapy or REBT. In addition to Ellis and Beck, others contributed to CBT's development and global recognition. These contributors include Maxie Maultsby, Michael Mahoney, Donald Meichenbaum, David Burns, Marsha Linehan, and Arthur Freeman (Corey, 2013).

CBT is a counseling theory that is not just one set of counseling techniques but a group of theories with similar methodologies. CBT uses various cognitive and behavioral techniques yet is not defined by its use of these strategies. According to the Beck Institute (2016), CBT uses problem-solving techniques and borrows from many psychotherapeutic modalities, including dialectical behavior therapy, acceptance and commitment therapy, Gestalt therapy, compassion-focused therapy, mindfulness, solution-focused therapy, motivational interviewing, positive psychology, interpersonal psychotherapy, and when dealing with personality disorders, psychodynamic psychotherapy.

The basic assumptions of CBT are that emotional and behavioral consequences result from inner thoughts and cognitions. People's thoughts determine their emotions, and the meaning they attach to the events determines their reactions. Psychological distress is primarily due to cognitions, and there is a tendency to develop faulty or ineffective thinking (Prochaska & Norcross, 2014). CBT helps people identify their distressing thoughts and evaluate how realistic they are. The ultimate therapeutic goal is to teach clients how to think about how they think to correct faulty reasoning. Therapists help clients identify, test, and evaluate beliefs and automatic thoughts so they can change those that are maladaptive.

Therapeutic Interventions often involve relaxation and mindfulness exercises. Mindfulness work is important in CBT because it is tough to change beliefs and automatic thoughts unless awareness is brought to them and bringing awareness to such detailed parts of the mind requires practice. Mindfulness practice can happen through many avenues, including online mindfulness-based applications.

Review of the Literature

Adolescent mental health. According to the World Health Organization, mental health is "a state of wellbeing in which every individual realizes his or her potential, copes with the normal stresses of life, works productively and fruitfully, and is able to contribute to her or his community" (World Health Organization, 2005, p.12). Before the Covid-19 Pandemic, mental health was a pressing concern in schools. The incidence of mental health disorders in adolescents has increased (Patton et al., 2014; Erskine et al., 2015). Research has shown that anxiety, depression, eating disorders, bipolar disorder, personality disorders, psychosis, addictive disorders, substance abuse, suicide attempts, and self-harm were becoming more prevalent (Paus

et al., 2008; Twenge et al., 2018; Burstein et al., 2019). The Covid-19 pandemic has exacerbated these issues and brought student mental health to the forefront in education.

In order to assess the mental health impact of the COVID-19 pandemic on children and adolescents, UNICEF Innocenti conducted a review of studies published worldwide between November 1st, 2019, and November 30th, 2020 (Sharma et al., 2021). This UNICEF report found a moderate increase in levels of depression, fear, anxiety, anger, irritability, negativity, conduct disorder, alcohol and substance use, and sedentary behaviors compared with pre-pandemic rates (Sharma et al., 2021). According to the *2022 State of Mental Health in America Report,* a study published by Mental Health America, using data collected by The Substance Abuse and Mental Health Services Administration, The Centers for Disease Control and Prevention, and the Department of Education, 5.08% of youth report suffering from at least one major depressive episode in the past year, which is an increase of 1.24% from the 2020 data. This same report also stated that 10.6% of youth struggle with major depressive disorder, there was an increase in reported adolescent substance and alcohol use in the past year, and 3.16% reported an illicit drug use disorder. Of extreme concern is that this same report indicates 60.3% of youth with depression do not receive any mental health treatment (Reinert et al., 2021).

Another national report, T*he Children's Mental Health Report: What we know about the COVID-19 pandemic's impact on children's mental health,* published by The Child Mind Institute, stated that the most common mental health symptoms teens reported dealing with were general anxiety, depression and social anxiety (Osgood et al., 2021). There are negative implications for adolescents if these mental health concerns go unaddressed. Anxiety, for example, can impact a child's ability to do well in the school setting, including academic problems, panic attacks, difficulty concentrating, avoidance, and emotional outbursts (Duval &

Roddy, 2019). Students who experience mental health difficulties at school tend to exhibit poor school adjustment, reduced concentration, low achievement, problematic social relationships, and a higher rate of health risk behaviors, such as substance use, school dropout, and expulsion (Valdez et al., 2011; Suldo et al., 2014; Donnelly & Farina, 2021). There is a need to address these mental health concerns to mitigate the detrimental effects. One way to support student mental health is through mindfulness practices. "Mindfulness does lead to results that educators can see over time: better self-regulation, more concentrated attention, more positive self-regard, a kinder attitude toward classmates, and more successful experiences in school and life" (Armstrong, 2019, p.36).

Mindfulness. Mindfulness is rooted initially in Buddhism but has become more secular and westernized since being introduced to the United States by Kabat-Zinn in 1979. Kabat-Zinn (2011) defines mindfulness as purposefully paying attention without judgment. The goal is to bring awareness to thoughts, sensations, and emotions. Thoughts are transitory, with an individual focusing on the present moment. Mindfulness has grown in popularity, with numerous studies empirically supporting its use in therapeutic and non-clinical settings. Interventions that address mindfulness and emotion dysregulation have effectively reduced symptoms in adults (Aldao et al., 2014; Norton et al., 2015) and youth (Burke, 2010; Huppert & Johnson, 2010; Meiklejohn et al., 2012). The first study to look at mindfulness-based interventions in a school setting was in 2005 when Napoli and colleagues evaluated 12 bimonthly mindfulness training sessions for kindergarten to third-grade students. Results from this pioneering study showed that compared with the passive control group, the intervention group evidenced moderate improvements in attention, social skills, and test anxiety (Napoli et al., 2005).

Mindfulness-based cognitive therapy for children. One of the more often used interventions is the Mindfulness-Based Cognitive Therapy for Children (MBCT-C; Semple & Lee, 2014). MBCT-C is a therapeutic approach developed for children ages 8-14. It is a 12-session, manualized group psychotherapy intervention. The manualized aspect of the intervention makes it highly accessible to therapists and counselors; there is no need for extensive training in the intervention, and treatment fidelity is less of a concern when the interventions are pre-formatted (Semple & Lee, 2007). The group nature of the intervention also enables numerous students to be receiving the intervention at one time. The goals are to improve self-management, attention, self-regulation, decentering thoughts from emotions, and increase social-emotional resiliency (Semple et al., 2010). Multiple studies have shown the effectiveness of MBCT-C in reducing anxiety symptoms, improving emotional regulation, and improving attention and behavior problems (Cotton et al., 2016; Felver et al., 2013; Semple et al., 2010).

Mindfulness-based stress reduction for teens. Another mindfulness intervention developed for children and adolescents is Mindfulness-Based Stress Reduction for Teens (MBSR-T; Biegel et al., 2009). MSBR-T is based on Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2003), an 8-week psychotherapeutic group intervention developed for youth ages 14-18. During the MSBR-T intervention, students focus on three core mindfulness techniques: mindful breathing, progressive body scans, and mindful stretching. This program has enhanced self-regulatory processes for urban male youth to reduce anxiety and promote the social functioning and academic performance of adolescents with learning disabilities and has shown to be a successful adjunct treatment for numerous mental health diagnoses in adolescents (Bamber & Kraenzle Schneider, 2016; Biegel et al., 2009; Sibinga et al., 2013).

Acceptance and commitment therapy for adolescents. Another mindfulness intervention acceptable for adolescent populations is Acceptance and Commitment Therapy for adolescents (ACT), based on the traditional Acceptance and Commitment Therapy work developed by Steven Hayes in 1999. Extensive work to develop ACT for adolescents has been done by Louise Hayes more recently. ACT combines behavioral change work with mindfulness strategies. The mindfulness strategies are slightly different from the traditional breathing, meditation, and yoga practices; they are manualized exercises developed for ACT (Felver et al., 2013). These group interventions are geared towards children ages 13-18. The sessions can last for one to two hours. The goal is to promote acceptance, contact with the present moment, and increase the ability to relate to one's experience (Hayes & Rowse, 2008). In a study conducted with clinically depressed adolescents, ACT was associated with clinically and a statistically significant improvement in depressive symptoms and quality of life (Petts et al., 2017).

Mindfulness benefits. Walton (2016) stated that the benefits of mindfulness for children include increased attention, improved school achievement and grades, better mental health, and improved social-emotional development through self-awareness and self-regulation. Numerous studies have found that mindfulness practices promote wellbeing and reduce psychological distress in adolescents (Arjunan & Joseph, 2016; Bluth & Eisenlohr-Moul, 2017; Waters et al., 2015). Mindfulness has helped students reduce their stress levels, assist in behavior management strategies, and improve self-esteem (Mendelson et al., 2010). Bergen-Cico and colleagues found that mindfulness practices increase compassion and acceptance of the self, leading to higher interpersonal skills and more effective communication (2013).

A 2014 study explored the relationships between high school students' mindfulness, self-compassion, and emotional wellbeing dimensions. The results suggested that mindfulness and

self-compassion correlated to emotional wellbeing (Bluth & Blanton, 2014). Arjunan and Joseph (2016) showed that mindfulness could reduce test anxiety in secondary schools.

School-based mindfulness. As research shows promising results of the potential benefits of mindfulness, there has been an effort to explore these possibilities in the classroom. Initial evidence suggests that classroom mindfulness interventions can reduce stress, decrease aggressive behavior, improve cognitive performance, and enhance resilience in students. “The emergence of mindfulness in education is giving children and educators the tools to overcome ACEs, manage the stresses of modern living." (Heilers, 2020 p.3). Costello and Lawler (2014) examined the effects of mindfulness meditation delivered by classroom teachers on the perceived stress levels among elementary school children. They found significant decreases in child-reported stress levels at the end of the intervention.

There are numerous classroom-based mindfulness programs available. For example, MindUP is a program used with elementary students. This program consists of four units with 15 sequenced lessons that promote self-regulation, optimism, gratitude, kindness, and community service (Crooks et al., 2020). Another example of a classroom curriculum is Learning to Breathe. This curriculum is specifically for adolescent students. The lessons emphasize enhancing emotion regulation, strengthening attention and performance, supporting prosocial behavior, building stress management skills, and improving health and wellbeing. (Metz et al., 2013).

An Australian study looked at three popular mindfulness curriculums, MindUP, Smiling Mind, and Meditation Capsules, to explore student and teacher experiences with mindfulness in the classroom (Arthurson, 2015). The author used all three programs to find what activities were more enjoyable and appropriate for a classroom and whether mindfulness-based activities would be suitable for children. The survey results revealed that students benefit from a variety of short

meditation activities. Van de Weijer-Bergsma et al. (2012) investigated the effectiveness of MindfulKids, an elementary curriculum delivered by classroom teachers in Amsterdam. The authors found prevention effects on stress and wellbeing. A study of Latino adolescents assessed the benefits of mindfulness using Mindfulness-Based Stress Reduction for Teens' curriculum on self-compassion, stress, and psychological symptoms (Edwards et al., 2014). The study results showed a reduction in depression and stress levels and increased self-compassion and mindfulness.

Online mindfulness-based interventions. Even with the popularity and support of face-to-face mindfulness-based classroom programs, they still require time and effort on the part of teachers. To implement any new program, teachers must become familiar with the curriculum, gather the necessary materials, and make the time for implementation (Crane, 2017). This can be a barrier to mindfulness-based interventions in schools. This lack of time coupled with the availability of technology has led to online mindfulness-based interventions. These online interventions are still an emerging field, but evidence indicates small to moderate effects on depression, anxiety, and wellbeing with possibly a more significant effect on stress (Spijkerman et al., 2016).

Birtwell in 2019 looked at whether attending a face-to-face taught course is associated with more frequent formal mindfulness practice and positive outcomes versus informal mindfulness practices. They found evidence that their frequency of use is the same whether people develop a mindfulness practice through face-to-face mindfulness training or informal mindfulness practice. This same study also showed positive impacts on participant wellbeing regardless of the type of mindfulness practice (Birtwell et al., 2019).

Students today have near-constant access to technology; numerous studies have found that technology-based mental health platforms are accessible and acceptable to adolescents. "The Internet and mobile phone applications are becoming increasingly popular tools for young people to seek information and support due to the convenience, privacy, ease of access and favorable mode of delivery" (Carlisle et al., 2018). Hollis and colleagues posit that digital platforms play a pivotal role in providing scalable and cost-effective mental health support to adolescents who do not seek out or receive treatment (Hollis et al., 2015). An Australian study evaluated the acceptability and effectiveness of a mobile phone application (WeClick) for improving depressive symptoms and other mental health outcomes; they found the app effective for improving wellbeing and help-seeking intentions (O'Dea et al., 2020). According to Pine (2021), the evidence base for digital mental health interventions of all kinds is accumulating due to the rapid development of technology. The COVID era has underlined the availability and acceptability of digital technologies for young people to learn, communicate and grow. These digital technologies can also offer alternative and promising modes of delivering mental health psychosocial support services. (Pine, 2021). Online mindfulness interventions are one example of these supports. “Because of their near-universal reach, smartphone apps and the internet are convenient channels for disseminating informal mindfulness-based interventions" (Pine, 2021).

Online mindfulness-based interventions have shown to be just as effective as face-to-face interventions in reducing stress and anxiety and increasing wellbeing (Levin et al., 2014; Querstret et al., 2018; Sevilla-Llewellyn-Jones et al., 2018; Spijkerman et al., 2016). Overall, these programs are well-liked by adolescents and resulted in increases in both emotion-regulation and self-regulation as well as reductions in depression, externalizing behaviors, and sleep problems (Bluth et al. 2016; Broderick and Metz 2009; Dvořáková et al. 2017; Eva and Thayer

2017; Fung et al. 2016; Fung et al. 2018; Metz et al. 2013; Shomaker et al. 2017). A meta-analysis of "self-help" mindfulness interventions (i.e., implemented by individuals themselves using books, web- sites, or applications) found a significant increase in mindfulness and lower symptoms of anxiety and depression relative to control interventions (Cavanagh et al. 2014). A recent study looked at an online mindfulness-based platform in Finnish upper secondary education students. They found a small-to-moderate reduction in anxiety, a slight reduction in depression, and a small increase in psychological quality of life (Lahtinen & Salmivalli, 2020).

Wersebe et al. (2018) examined the use of an online website to determine associations between increased psychological flexibility with decreases in stress and increases in wellbeing. The intervention consisted of an online self-help mindfulness website based on acceptance and commitment therapy. After six weeks, the results revealed increased well-being, psychological flexibility, and decreased stress. A meta-analysis by Jayawardene et al. (2017) looked at online mindfulness interventions of MBSR for non-clinical populations. The results demonstrated that online mindfulness interventions were equally effective as face-to-face interventions for stress reduction. Walsh et al. (2019) investigated using a mobile mindfulness application (Wildflowers) to improve subjective wellbeing, attentional control, and interoceptive integration. The authors concluded that the mobile application could provide long-term benefits for attentional control and immediate effects on mood and stress. According to Jayawardene et al. (2017), online mindfulness-based interventions have become appealing because they are cost-effective, user-friendly, and readily accessible.

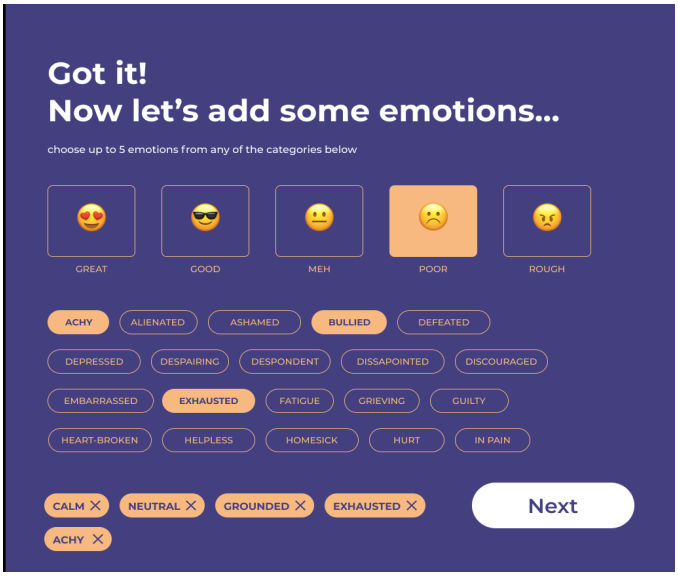
MyLife for Schools

MyLife for Schools is an example of one such online mindfulness intervention. MyLife for Schools is a web-based mindfulness application, distance learning, and a hybrid educational model for the classroom. It was developed to support Social Emotional Learning in middle and high school. Students check in regularly through the check-in screen that appears when the application is opened. They choose emojis and words to represent how they feel in the present moment, and MyLife recommends short mindfulness activities based on the responses of these check-ins. The nonprofit Tools for Peace developed MyLife for Schools, which teaches mindfulness to at-risk youth in California. It was initially called Stop, Breathe, Think, and started as a phone application. The company then developed a web-based platform specifically geared towards schools. In the summer of 2020, the name changed to MyLife for Schools, but the content remained the same. (MyLife, 2021).

MyLife for Schools works by prompting students to describe their current mood, emotional state, and physical health by choosing from several emotions. Students can choose up to 5 different characterizations of their mood, emotional state, and how they are feeling physically (see Figure 1). They can also choose not to provide any input and simply engage in an activity. MyLife for schools then provides suggestions for specific meditation and mindfulness activities (see Figure 2). The user can then choose from among the suggested activities. When the activity is finished, they are prompted to complete the same emotional, mental, and physical check-in post activity.

Figure 2.1 Emotional Check-In

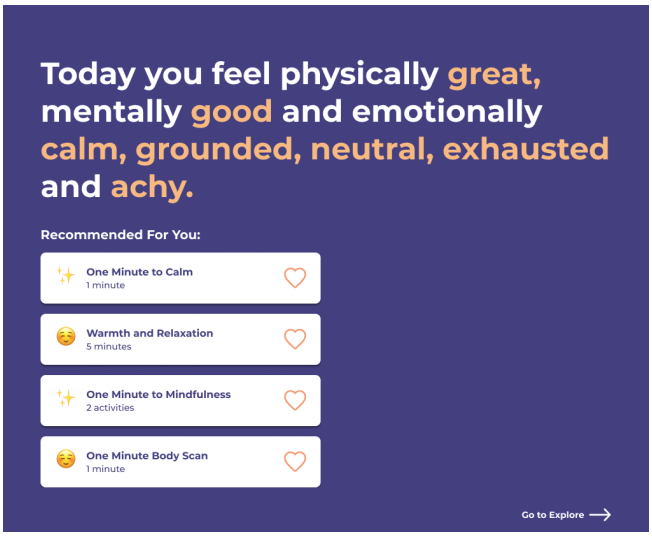
MyLife for Schools Check-In



Note. This is the emotional check-in screen that would appear after the physical and mental check-in.

Figure 2.2 Mindfulness Recommendation

MyLife for Schools Recommendation Page



Note. This is the screen that gave individualized recommendations based on check-in answers.

Research done by Athanas et al. in 2019 looked specifically at the effects of immediate and long-term use (i.e., at least ten engagements) of the smartphone app Stop, Breathe & Think (SBT) on users' emotional states. They found that there was an association between the length of use and a positive change in basal emotional state among long-term users of the app. They also found that individuals who were anxious or depressed tended to have a favorable long-term emotional transition after using the app for an extended period (Athanas et al., 2019).

Measured Outcomes

Academic performance. Much educational research focuses on student academic performance. The U.S. Department of Education (2019) declared that academic achievement is the central priority in our nation's schools and the means to which educational excellence and equity for all students is accomplished. Student achievement is of great concern to students, parents, teachers, school leadership, districts, and even local, state, and federal government. Naturally, therefore, research on mindfulness in schools has been concerned with student mental health and the impact of mindfulness on academic performance. In secondary settings, studies found that mindfulness leads to more collaborative learning, better practical analytical skills, improved problem solving, more participation in the academic realm, better concentration, and higher levels of focus (Ball et al., 2014; Black & Fernando; 2014; Figueroa, 2013; Helmer, 2014). A correlation between mindfulness and academic performance was found in a 2010 study by Franco and colleagues. They examined the relationship between a mindfulness program and academic performance in a secondary school in Spain. They looked at the results of the State-Trait Anxiety Inventory (STAI) and student grades before and after a ten-week mindfulness study, in which the treatment group practiced meditation for 30 minutes daily and 1.5 hours of mindfulness training was provided to the group per week. Wick (2013) studied the impacts of

mindfulness on academic performance and overall wellbeing in a public high school. The researcher studied the academic performance, attendance, and student behavioral referrals before and after nine-week meditation practice. The results demonstrated that grades improved for the treatment group and that their tardy class periods decreased. Knepper (2015) investigated the effects of a mindfulness program on middle school students. He found that mindfulness significantly impacted GPA and academic achievement among students who lacked self-regulation and self-efficacy. Bakosh et al. (2016) studied the effects of a mindfulness intervention on 3rd-grade students' quarterly grades in reading and science. The intervention group listened daily to a 10-minute mindfulness track during the eight-week study. There were significant gains in reading and science compared to the control group. The impact of mindfulness on academics appears to span all learning styles (Lawlor, 2014; Troyer et al., 2012). There are, however, researchers that have concerns with the methodology of the current work and encourage more methodologically sound research in the future (Del Re et al., 2013; Goyal et al., 2014; Van Dam et al., 2018; Williams et al., 2014).

Attendance. Numerous researchers have used school attendance as a predictor of student success. The National Forum on Education Statistics (2009) reported that students with regular school attendance showed higher academic achievement levels. Research has shown that elementary and middle school students' student attendance and academic achievement showed positive and statistically significant correlations (Gottfried, 2010). More recently, Simon et al., (2020) studied students' attendance and found that students with low absenteeism and students with decreasing absentee rates inked to positive outcomes with positive outcomes in classroom performance, both academically and behaviorally.

Researchers have found similarly positive outcomes with mindfulness programs in schools (Coatsworth et al., 2010; Semple et al., 2005; Napoli et al., 2005). Caballero et al. (2019) looked specifically at the relationship between mindfulness and attendance. They studied the mindfulness levels of 2,300 middle schoolers and measured attendance as an indicator of success in school. They found a correlation between greater student mindfulness and better attendance, fewer suspensions, and greater academic performance.

Student Behavior. Student behavior is a significant component of school climate. An analysis of research on school discipline by Gregory and colleagues found that research identifies a "strong positive relationship between time engaged in academic learning and student achievement," which is negatively affected by disruptive student behavior (Gregory et al., 2010, p. 60). More students are entering classrooms exhibiting challenging behaviors which make teaching and learning for every student in the classroom difficult (Beauchemin et al., 2008; Felver et al., 2013). Disruptive behavior goes beyond minor disturbances that are easily redirected; these behaviors can become a barrier to learning (Ghazi et al., 2013).

Jones et al. (2014) stated that when children have adequate social and emotional skills, they can listen, focus, follow directions, manage emotions, work cooperatively with classmates, and work through conflicts. When children feel confident in these areas, disruptive behavior in the classroom is minimized. Pufall Jones et al. (2018) indicated that SEL could be used "as a preventative approach to school discipline" since students increase their control over emotions and behavior as a result of an SEL approach (pp. 14-15).

In that vein, mindfulness has gained traction as an SEL strategy in schools in recent years. Mindfulness encourages calmness and peacefulness in each student, translating into a calm and peaceful learning environment (Miller, 2011). Schools can teach children how to be self-

aware so that they can "recognize their own emotions in various situations and put a name to them" (Sprenger, 2020, p. 63). That self-awareness is an essential aspect of mindfulness. Research by Butzer et al. (2015) added that mindfulness could help children behave in more positive ways through mindful practices such as mindful movement and breathing techniques. Practicing mindfulness allows the fight or flight brain response to calm, permitting individuals to be more responsive rather than reactive to challenging situations (Butzer et al., 2015). Martinez and Zhao (2018) found that guided mindfulness training can support managing student behavior and transform school discipline approaches from reactive to proactive. Black and Fernando (2014) investigated mindfulness using the Mindful Schools program and teacher-reported scores of students' classroom behaviors. The study results indicated a correlation between behavior improvement and mindfulness intervention.

Summary

Students are experiencing high emotional distress, impacting their health and overall wellbeing (American Psychological Association, 2014). Therefore, it is vital to develop innovative, supported, and ethical strategies and interventions that can support the mental health of children and adolescents. School settings are appropriate places to implement interventions because students spend a significant part of their lives there (Zenner et al., 2014). One possible intervention is mindfulness. Mindfulness-based interventions have proven effective for improving mental health and enhancing wellbeing (Eklund et al., 2017; Parsons et al., 2017; Van Genugten et al., 2016; Waters et al., 2017). There is growing enthusiasm for the development of online platforms that provide mindfulness and meditation to relieve stress and promote mental health and well-being (Athanas et al., 2019; Jayawardene et al., 2017; Spijkerman et al., 2016).

As discussed, the research questions for this study emerged from the literature based on the lack of online mindfulness-based interventions implemented in schools. As Meiklejohn et al. (2012) stated, "These identified challenges point to the indispensable role that ongoing research will need to play in broadening the credibility and appeal of mindfulness training for K-12 students" (p. 12). The specific gap addressed by this literature review was the absence of information about the efficacy of online mindfulness training in high school students (Carsley et al., 2017; Daudén Roquet & Sas, 2018; Felver et al., 2015; McKeering & Hwang, 2018; Semple et al., 2017; Spijkerman et al., 2016; Zenner et al., 2014). This study contributed to the literature by examining any possible relationship between student academic performance, attendance, behavior, and social-emotional development and the utilization of an online mindfulness-based application.

Chapter 3 - Methodology

Introduction

The purpose of this quasi-experimental ex post facto study was to determine if a difference existed in student academic performance, attendance, behavior, social-emotional growth during the year that a school was utilizing an online mindfulness intervention and a year they were not. The literature review provided supporting evidence for the feasibility and effectiveness of mindfulness as an intervention for adolescents in school settings (Bluth et al., 2015; Mahmood et al., 2016). As mentioned previously, much of the current research consists of face-to-face instruction by trained teachers or experienced facilitators. As discussed in Chapter 2, the existing body of knowledge about mindfulness in school settings is growing, and this study addressed a specific gap in the absence of information about the use of online mindfulness interventions with high school students (Carsley et al., 2017; Daudén Roquet & Sas, 2018; Felver et al., 2015; McKeering & Hwang, 2018; Semple et al., 2017; Spijkerman et al., 2016; Zenner et al., 2014). The remainder of this chapter discusses the research design chosen to address the research questions and hypotheses. It also defines the variables, population, and instrumentation.

Statement of Problem

This study examined the use of an online mindfulness intervention in a Midwestern High School. Understanding the relationship of online mindfulness practices and academic, behavioral, and social-emotional outcomes is valuable because while many of these online mindfulness applications have promoted changes in wellbeing (McKay et al., 2016), there is still little research evaluating these applications. (Daudén Roquet & Sas, 2018). Owing to this gap in the literature (Carsley et al., 2017; Daudén Roquet & Sas, 2018; Felver et al., 2015; McKeering

& Hwang, 2018; Semple et al., 2017; Zenner et al., 2014), there was a need to explore further online mindfulness interventions in high school students.

Research Questions and Hypotheses

For this study, student data were collected in the fall of 2020 and the fall of 2021. An online mindfulness intervention, My Life for Schools, was used by students during the fall of 2020. With this context, the research questions addressed by this study were the following:

1. Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021?
2. Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021?
3. Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021?
4. Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021?

The researcher used a quasi-experimental, ex post facto design. The data used were archival aMath, aReading, MySAEBRS, attendance, and behavior referral data from the fall semesters of the 2020-2021 and 2021-2022 school years.

RQ1: Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021?

$H1_o$: There is no statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021.

$H1_a$: There is a statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021.

RQ2: Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021?

$H2_o$: There is no statistically significant difference between students' attendance in Fall 2020 and Fall 2021.

$H2_a$: There is a statistically significant difference between the attendance of the students in Fall 2020 and Fall 2021.

RQ3: Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021?

$H3_o$: There is no statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021.

$H3_a$: There is a statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021.

RQ4: Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021?

$H4_o$: There is no statistically significant difference between the MySAEBRS scores for students in Fall 2020 and Fall 2021.

$H4_a$: There is a statistically significant difference between the mySAEBRS scores for students in Fall 2020 and Fall 2021.

Research Methodology

This study utilized quantitative methodology. A quantitative research method was appropriate for the study to assess the differences, if any, between academic performance, attendance, behavior, and social-emotional growth during the semester that students were using an online mindfulness intervention and a semester in which they were not. Quantitative research

tests the relationship between one variable and another, unlike the qualitative inductive reasoning approach which determines patterns from data analysis (Creswell, 2009). Quantitative researchers rely on objective means to collect data and use a variety of research tools, including online surveys, paper-and-pencil questionnaires, and analysis of existing data (ex post facto) (Butin, 2010; Creswell, 2016; Gay et al., 2012) This ex post facto study used one-way ANOVAs and two-proportion z-tests to determine if differences existed between student academic performance, attendance, behavior, and social-emotional development when utilizing an online mindfulness application.

Research Design

A one-way ANOVA was an appropriate choice for this study because the purpose of an analysis of variance is to compare two or more groups that are exposed to separate variables and to see if there is a difference and to what extent, in the dependent variable between the two groups (Rutherford, 2011). An ANOVA is considered to be the extension of the t-test (Rutherford, 2011) as it examines the difference between groups simultaneously. The purpose of a one-way ANOVA test is to compare two or more group means and is appropriate whenever you have one quantitative dependent variable and one categorical independent variable (Johnson & Christensen, 2012). The researcher utilized a one-way ANOVA to determine if there were statistically significant differences between the changes in the means of aReading, aMath, and mySAEBRS scores between the groups. The effect size of a one-way ANOVA is computed by finding the eta squared, which is the proportion of variance associated with each main effect and interaction effect. This is calculated by dividing the sum of squares of an effect for one variable by the total sum of squares in the ANOVA model (Johnson & Christensen, 2012). One-way

ANOVA tests were used in this study to assess for differences in students' fall and winter aMath, aReading, and mySAEBRS scores in the 2020-2021 school year and 2021-2022 school year.

The behavior and attendance data were analyzed using two-proportion z tests. A two-proportion z-test is used to test for a difference between two population proportions. A two-proportion z test was used to compare the attendance and behavior data from the fall semester for the 2020-2021school year to the fall semester attendance and behavior data from the 2021-2022 school year. The two-proportion z test helped the researcher evaluate whether the percentages of students present at school were significantly different between the two years. To evaluate the student behavior data, specifically the number of school-level student discipline referrals for each fall, the researcher used the same statistical test to determine whether the fall 2020 student discipline referrals were statistically different than the fall 2021 discipline referrals.

To answer Research Question 1, the researcher analyzed academic performance data indicated by scores from the aReading FASTBridge test and the aMath FASTBridge test. The data gathered came from two administrations of the FASTBridge tests (Fall and Winter) during the 2020-2021 school year during which students were practicing mindfulness and the 2021-2022 school year in which they were not. The scores were used to identify differences in academic performance.

To answer Research Question 2, the researcher analyzed student attendance data as measured by a percentage of absent students for the fall semester of the 2020-2021, and 2021-2022 school years. To determine the statistical significance of differences in attendance the researcher used a two-proportion z test to compare the proportion of students absent during the 2020-2021 fall semester to the 2021-2022 fall semester.

To answer Research Question 3, the researcher analyzed student behavior by comparing the student discipline referrals for the fall semester of the 2020-2021 school year to the fall semester of the 2021-2022 school year. To determine the statistically significance of differences in student behavior, the researcher used a two-proportion z test.

To answer Research Question 4, the researcher analyzed social-emotional growth data as indicated by scores from the mySAEBRS. The data gathered came from two administrations of the mySAEBRS (Fall and Winter) during the 2020-2021 school year during which students were practicing mindfulness and the 2021-2022 school year in which they were not. The scores were used to identify differences within social-emotional development using a one-way ANOVA.

Population

The population for this study was ninth-grade students in a Midwestern high school. The total 9th-grade student enrollment for the fall of 2020 was 486 students, 114 of those students moved between the remote and in-person model during the year. The remaining 372 were completely in-person. During the fall of 2021, the 9th-grade enrollment was 545 students. Total eligible scores examined for this study were determined based on the completion of both fall and winter aMath, aReading, and mySAEBRS assessments. Any student who did not have scores for both Fall and Winter were removed in the data cleaning process. The selected high school's demographics included 62.9% White, 20.7% Hispanic or Latino, 6.8% Black or African American, 9.6% Other race or ethnicity. The school identified 46.1% of the students as socioeconomically disadvantaged, 9.4% English learners, 15.8% with disabilities, and 1.5% as migrant students. The specific demographics are listed in Tables 3.1 and 3.2

Table 3.1 Race/Ethnicity Demographics

Demographics of Population by Race/Ethnicity

School Year	American Indian	Asian	Black	Hispanic	Native Hawaiian	Multi-Ethnic	White
2020-2021	.82%	3.5%	7.41%	12.14%	.21%	7.2%	68.72%
2021-2022	.73%	4.04%	7.71%	17.8%	.18%	9.54%	60%

Table 3.2 Educational/Socioeconomic Status Demographics

Demographics of Population by Educational and Socioeconomic Status

School year	Students Receiving Services		Economically Disadvantaged
	Special Education	ESOL	
2020-2021	114	14	44.65%
2021-2022	118	14	52.11%

The target population for this study was students from a specific high school, selected for convenience to the researcher. During the 2019-2020 school year, the target school was selected as a pilot school for MyLife for Schools. The pilot was scheduled to run from March-May 2020. Because of the Covid-19 Pandemic, the school was shut down in March 2020 and unable to participate in the pilot. Because of this, MyLife for Schools provided the target school with free

access to the program for the Fall of 2020. The school also paid for access to the program for the spring 2021 semester. All 9th-grade students enrolled during the 2020-2021 school year participated in daily online mindfulness activities through the MyLife for schools platform. During the 2021-2022 school year, the students were still experiencing the impacts of COVID-19 but were unable to utilize the MyLife for Schools online platform.

Instrumentation

FASTBridge

The What Works Clearinghouse recommends the use of universal screeners as part of a three-tiered system to provide early intervention for students (What Works Clearinghouse, 2009). A universal screener is an assessment given to all students within a district. In this study, universal screener data from the FASTBridge aMath and FASTBridge aReading were used to explore student progress over time. Screening scores identify each students' academic performance level using risk benchmarks and national norms. This provides growth rates and growth norms to assess progress toward end-of-year goals, and indicate the concepts and skills that are above, below, and within the student instructional range. These assessments also provide criterion-referenced cut scores that serve as benchmarks to classify students as high risk, some risk, or low risk of not meeting end of year performance goals (FASTBridge Learning, 2019). The cut scores are intended to predict whether a student is "At-Risk" for their grade level. Students who score below the 15th percentile of the normed scores for their grade level are marked "High Risk". Students who score below the 39th percentile but above the 15th are labeled "Some Risk" and those that score above the 40th percentile are deemed "Low Risk or College Pathway".

aMath. According to their website, the aMath adaptive algorithm uses item response theory (IRT) and Bayesian scoring to administer up to 30 questions to achieve an SEM of 0.20 on the logit scale. (Illuminate Education, 2021). The IRT score is translated into an aMath scaled score. Scaled scores range between 150 and 250, with a mean of 200 and a standard deviation of 15. See Table 3.3 for the correlations of percentile range/risk level to benchmark score on the aMath assessment.

Table 3.3 Benchmark aMath

Benchmark Scaled Scores for aMath

Grade	Risk Level	Fall	Winter	Spring
Nine	College Pathway	>= 235.3	>= 236.2	>= 237.1
	Some Risk	< 223.8	< 224.4	< 225.2
	High Risk	< 211.8	< 212.7	< 213.4

Note. Adapted from Benchmark: aMath, by Illuminate Education Inc., (2022). Retrieved from https://prodapp01green.fastbridge.org/resource/benchmarksAndNorms.do?type=tab1&amId=3&gradesIds=11

aReading. FASTBridge aReading assessment measures students' skills in decoding, word identification, and comprehension. aReading assessments are administered three times a year (in the fall, winter, and spring). Although it does not measure reading rate, aReading is a direct measure of broad reading (i.e., phonological, orthographic, and semantic skills, which include vocabulary and comprehension). aReading utilizes scaled scores with a minimum possible score of 350 and a maximum score of 650. The assessment has a mean score of 500 with a standard

deviation of 50 through all grade levels, kindergarten through 12th Grade. As with the aMath assessment, normative data is provided through benchmark scores. "FASTBridge reports include normative data compared to the group (e.g., class), school, district, and national distributions which characterize typical performance for each grade level, by season." (Christ et al., 2018, p. 51). See Table 3.4 for the correlations of percentile range/risk level to benchmark score on the aReading assessment.

Table 3.4 Benchmark aReading

Benchmark Scaled Scores for aReading

Grade	Risk Level	Fall	Winter	Spring
Nine	College Pathway	>= 553.5	>= 555.0	>= 556.7
	Some Risk	< 537.8	< 539.4	< 541.1
	High Risk	< 518.6	< 520.2	< 521.9

Note. Adapted from Benchmark: aReading, by Illuminate Education Inc., (2022). Retrieved from https://prod-app01-green.fastbridge.org/resource/benchmarksAndNorms.do?type=tab1&amId=2&gradesIds=11

MySAEBRS. MySAEBRS (my Social, Academic, and Emotional Behavior Risk Screener) is a brief, norm-referenced tool for screening all students to identify those at risk for social-emotional behavior problems (Illuminate Education, 2021). According to their website, MySAEBRS can be used to identify students who are at risk for social, academic, and emotional behaviors up to five times a year (Illuminate Education, 2021). The district where the research was conducted screens all students three times a year, Fall, Winter, and Spring in order to

identify students with social and emotional development concerns for placement in tiered interventions.

MySAEBRS is a 20-item rating scale that is designed to evaluate student functioning in terms of overall general behavior (Total Behavior; 20 items), Social Behavior (7 items), Academic Behavior (6 items), and Emotional Behavior (7 items). In order to complete the mySAEBRS, an individual student rates each of the items using a 4-point Likert scale indicating the frequency with which they displayed the described behaviors during the past month. (Illuminate Education, 2021). See Table 3.5 for the benchmark scores in mySAEBRS. The researcher collected data from the Fall and Winter mySAEBRS administrations for the 2020-2021 school year as well as the 2021-2022 school year.

Table 3.5 Benchmark mySAEBRS

Benchmark Scores mySAEBRS

Measure	Risk Level	Fall	Winter	Spring
Behavior	Some Risk	< 35.0	< 35.0	< 35.0
	High Risk	< 25.0	< 25.0	< 25.0
Academic Behavior	Some Risk	< 10.0	< 10.0	< 10.0
	High Risk	< 7.0	< 7.0	< 7.0
Emotional Behavior	Some Risk	< 11.0	< 11.0	< 11.0
	High Risk	< 8.0	< 8.0	< 8.0
Social Behavior	Some Risk	< 13.0	< 13.0	< 13.0
	High Risk	< 10.0	< 10.0	< 10.0

Note. Adapted from Benchmark: mySAEBRS, by Illuminate Education Inc., (2022). Retrieved from https://prod-app01-green.fastbridge.org/resource/benchmarksAndNorms.do?type=tab1&amId=180&gradesIds=11

Attendance Data

For attendance data, the researcher requested the attendance data for all students from the fall semester for the school years 2020-2021 and 2021-2022. The whole-school attendance data was given in the percentages of present students. The data included students that were absent for one or more full periods during the school day. There was attendance data collected in both the

in person and the remote school for the fall of 2020. The school-level data allowed the researcher to determine if there were statistically significant differences in attendance between the year students were utilizing MyLife for Schools and the year they were not.

Behavior Data

The researcher requested student behavior data for all students during the fall of the 2020-202 and 2021-2022 school years. The school provided the number of school-level discipline referrals for the fall semester in the specified years. Because this study is limited to aggregate and whole-school data, additional individual demographics for these samples were not collected.

Validity and Reliability

Universal Screener Assessment and research instruments must be reliable and valid to draw conclusions. Validity is defined by Gray (2018) as "the degree to which data in a research study are accurate and credible" (p. 774). Validity exists when an assessment measures what it is intended to measure. According to Gray (2018), reliability is "the degree to which an instrument will produce similar results at a different period" (p. 772). Test and re-test reliability are calculated by administering the same test more than once over time (Creswell, 2014).

aMath. The National Center on Intensive Intervention's findings indicated that the FASTBridge aMath assessment shows "convincing evidence" in the area of reliability and validity (American Institute for Research, 2021). The Center also indicates that aMath has more convincing evidence for disaggregated reliability, validity, and classification data for diverse populations than any other assessments explored. The FASTBridge aMath universal screener is in the early stages of implementation. Still, according to the Center on Intensive Intervention website, the screener has "moderately low" results in generalizability and convincing evidence

for validity (American Institute for Research, 2021). The predictive validity was 0.82, and concurrent validity was 0.81. The IRT-score-based reliability was 0.98, and the test-retest reliability was 0.94 (American Institute for Research, 2021).

aReading. The National Center on Intensive Intervention's findings indicated that the FASTBridge aReading assessment shows "convincing evidence" in the area of reliability and "partially convincing evidence" for validity (American Institute for Research, 2021). The predictive validity was 0.58, and construct validity was 0.73. The model-based reliability was 0.91(American Institute for Research, 2021). The measure has a test-retest of .79, Cronbach's alpha of .95, and construct and predictive validity above the .70 standard (National Center on Intensive Intervention, 2021).

mySAEBRS. In order to examine the validity of the mySAEBRS assessment, a study conducted by Kligus, et. al., (2019) looked at a series of confirmatory factor analyses (CFA) to evaluate the extent to which various factor models fit mySAEBRS data. In this study, it was determined that a bifactor model with a single broad factor and three subfactors corresponding to academic, social, and emotional behavior was best. Results of this study were also able to confirm findings from previous studies. Internal consistency was estimated for each scale with a range of 0.79 to 0.94 (Kilgus et al., 2016). Inter-rater reliability ranged from 0.41 to 0.48 for the overall academic behavior and social behavior scales (Kilgus et al., 2015). The mySAEBRS assessment has research-supported internal consistency, predictive validity, and diagnostic accuracy (von der Embse et al., 2017).

Data Collection Procedures

The intervention for this study took place during the 2020-2021 school year. The research site school received an opportunity to pilot the MyLife for Schools program free of charge

during the Spring of 2020. Because of the Covid-19 pandemic, the access time changed to the 2020-2021 school year. Parents were informed that their students would be utilizing this daily mindfulness platform during orientation and sent a parent introduction letter. (See Appendix B) Teachers were presented instructions on using the MyLife for Schools website (See Appendix C) during their professional development. The students were informed about the details and procedures (See Appendix D) during an advisory lesson. Students also practiced logging into the website and set up their MyLife for Schools accounts. As described in Chapter 1, MyLife for Schools is a mindfulness and relaxation tool that incorporates short sessions that include experiential practice based on the user's check-in information. During the Fall of 2020, all ninth-grade students were given access to the MyLife for Schools mindfulness platform. They were cued to complete a mindfulness activity each week in an advisory class. They were also cued to use the platform during class for brain breaks, relaxation, test prep, anxiousness, and at their discretion at home or at school. During this semester, the students were also completing their district-wide universal screeners of aMath, aReading, and mySAEBRS in both the fall and the winter.

Data collection began once the dissertation committee and Kansas State University Institutional Review Board (IRB) approved the study on February 5th, 2022. Since the researchers used only archival data for this study and the intervention was an approved school-wide intervention, the researcher did not obtain informed consent from participants. The Kansas State University IRB granted an exemption waiver (Appendix E).

The academic performance data for this study were collected from the FASTBridge aMath universal screener in mathematics and the FASTBridge aReading universal screener in reading for the Fall and Winter administrations. The researcher requested that the assistant

principal from the research site provide the aggregate attendance and behavior data for the 2020-2021 and 2021-2022 school years fall semester in the form of a digital spreadsheet. The academic data from the Fall and Winter aMath and aReading assessments were requested from the district's secondary MTSS coordinator, who administers and manages the FASTBridge data. The researcher had access to the MySAEBRS data due to her role within the district. All the collected data were then imported into IBM SPSS Statistics Grad Pack 28 for MAC for statistical analysis.

Data Analysis Procedures

Data were analyzed to determine if there was a statistically significant difference in the academic performance, attendance, behavior, and social-emotional development during the year students were using MyLife for Schools and the year they were not. Data from the schools' administrations of the aReading and aMath FASTBridge tests were used to determine if there were differences in students' academic performance from the 2020-2021 school year, during which the online mindfulness platform was being used, and the 2021-2022 school year in which it was not using a one-way ANOVA. The researcher analyzed the aReading test scores separately from the aMath test scores to answer Research Question 1.

A two-proportion z test was used to compare the attendance data from the fall semester for the 2020-2021 and 2021-2022 school years. The two-proportion z test was used to help the researcher evaluate whether the percentages of students' attendance were significantly different between the two groups. The researcher conducted this analysis to answer Research Question 2.

In order to answer Research Question 3, student behavior data, specifically the number of school-level student discipline referrals during the fall semesters of the 2020-2021 and 2021-2022 school year, was evaluated using a two-proportion z test. This statistical test allowed the

researcher to determine if there was a significant difference between the two groups within the category of student discipline referrals.

For Research Question 4, the researcher used data from the schools' administrations of the mySAEBRS assessment from the Fall and Winter administrations for the 2020-2021 and 2021-2022 school year to conduct a one-way ANOVA in order to determine if there were differences in the growth of students' social-emotional development.

Data Storage. All electronic data collected were coded and stored in the Kansas State University encrypted computer system to ensure confidentiality. Any printed copy of collected data at the research site was kept locked and secured in the school counselor's office. All school and student responses were collected in aggregate protecting confidentiality. All electronic data collected were coded and stored in the Kansas State University encrypted computer system to ensure confidentiality. Any printed copy of collected data at the research site was kept locked and secured in the school counselor's office. The researcher received no individual student data. The research data related to students (aggregated aReading, aMath, mySAEBRS scores, school-level student attendance percentages, student discipline referrals) was stored electronically. All legal, ethical, and FERPA guidelines were followed.

Human Subject Review. There were no anticipated ethical concerns regarding this study; however, the practice of mindfulness has been linked to numerous positive health, wellness, and academic outcomes. The study will begin following the approval of the committee and the Kansas State University Institutional Review Board (IRB).

Summary

This chapter outlined the research question, hypothesis, design, setting, sample, instrumentation, data collection, data analysis procedures, and ethical concerns. The research

question and hypothesis aimed to examine if there was a statistically significant difference in student academic performance, attendance, behavior, social-emotional development, and the utilization of an online mindfulness-based application. In Chapter 4, the results of the study are presented.

Chapter 4 - Data Analysis and Results

Introduction

The purpose of this quantitative, quasi-experimental, ex post facto study was to examine if there were differences in student academic performance, attendance, behavior, and social-emotional growth during a semester in which the school was utilizing an online mindfulness intervention and a semester in which they were not. Chapter four presents the findings of the data collection and analysis.

The researcher cleaned the data to account for missing information. Any data that did not include both fall and winter assessment scores were removed. The researcher studied student academic performance by analyzing aMath and aReading scores, the attendance was indicated by the percentage of students present, the student behaviors were studied using the percentage of students receiving discipline referrals, and the social-emotional growth was researched by analyzing changes in the mySAEBRS scores from Fall to Winter.

RQ1: Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021?

$H1_o$: There is no statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021.

$H1_a$: There is a statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021.

RQ2: Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021?

$H2_o$: There is no statistically significant difference between students' attendance in Fall 2020 and Fall 2021.

$H2_a$: There is a statistically significant difference between the attendance of the students in Fall 2020 and Fall 2021.

RQ3: Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021?

$H3_o$: There is no statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021.

$H3_a$: There is a statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021.

RQ4: Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021?

$H4_o$: There is no statistically significant difference between the MySAEBRS scores for students in Fall 2020 and Fall 2021.

$H4_a$: There is a statistically significant difference between the mySAEBRS scores for students in Fall 2020 and Fall 2021.

Descriptive Findings

Sample description. As the data collection occurred ex post facto, data were not collected for this study; secondary data were obtained from the school district. The data used for this study were the aMath, aReading, and mySAEBRS scores of students who took the assessments in both the fall and winter of their ninth-grade year. The other data collected were the attendance and behavior referral data for the fall semesters of 2020 and 2021. A total of 486 students attended the research site school in the fall of 2020. Five hundred and forty-five students attended the research site school in the fall of 2021.

Data Analysis Procedures

Data were analyzed to determine if there were statistically significant differences in students' academic performance, attendance, behavior, and social-emotional growth between the two semesters. During the Fall of 2020, students were utilizing MyLife for Schools and during the Fall of 2021, they were not. School-level data from the school's administrations of the aReading and aMath assessments from the Fall and Winter of 2020 were used to compare students' academic performance with the scores of students from the Fall and Winter of 2021. Descriptive statistics were analyzed for each assessment (Tables 4.1 and 4.4) and using the growth (the difference between the Fall and Winter scores) calculated by the assessment system, the average growth between the Fall and Winter assessments was analyzed using a one-way ANOVA. The researcher compared the aReading test scores separately from the aMath test scores.

A two-proportion z test was used to compare the student attendance for the Fall of 2020 to the Fall of 2021. The two-proportion z test helped the researcher evaluate whether the percentages of students present at the school level were significantly different between the two groups. In this case, the two-proportion z test was used to evaluate whether the percentages of students present at school were significantly different for the different school years.

Student behavior data, specifically the number of school-level student discipline referrals for the Fall of 2020 and 2021, were evaluated using a two-proportion z test. This statistical test allowed the researcher to determine if there was a significant difference between the two years within the category of student discipline referrals.

For the analysis of social-emotional growth, school-level data from the school's administrations of the mySAEBRS assessments from the Fall and Winter of 2020 were used to

compare students' social, academic, emotional, behavior risk scores with the mySAEBRS scores of students from the Fall and Winter of 2021. Using the growth calculated by the assessment system (the difference between the Fall and Winter scores), the average growth between the Fall and Winter assessments was analyzed using a one-way ANOVA.

Results

Research Question 1: Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021?

$H1_o$: There is no statistically significant difference between the changes in FASTBridge scores during the Fall 2020 and Fall 2021. In order to answer the first research question for the study, student academic achievement on the Fall and Winter aMath and aReading assessments were analyzed using a one-way ANOVA. This test was conducted for the study to investigate if there was a statistically significant mean difference in aMath and aReading scores during the semester when students were using the online mindfulness intervention (Fall and Winter 2020) and when they were not (Fall and Winter 2021). See Tables 4.2 and 4.3.

Table 4.1 aMath Descriptive Statistics

aMath Scores

	N	M	SD	SE	Minimum	Maximum
Fall 2020	404	230.9226	10.20630	.50778	197.39	264.61
Winter 2020	404	231.7661	10.99288	.54692	197.92	275.00
Fall 2021	453	229.6329	11.60746	.54537	189.99	275.00
Winter 2021	453	230.0961	11.54499	.54243	194.72	275.00
Total	1714	230.5621	11.14969	.26931	189.99	275.00

The average aMath score increased each year between the Fall and Winter assessments, Fall 2020 M=230.9, Winter 2020 M= 231.8, Fall 2021 M= 229.6, and Winter 2021M=230.1(see Table 2). The average growth between Fall and Winter aMath assessments is shown in Table 4.2 below. The students in 2020 showed a higher average growth (M=.202) than in 2021(M=.134).

Table 4.2 aMath Growth

aMath Average Growth from Fall to Winter Assessment

	N	Mean	SD	SE
2020 Growth	404	.202086	1.1004377	.0547488
2021 Growth	453	.134419	1.0433743	.0490220

An independent-samples t-test was conducted to compare the aMath score growth for 2020 and 2021. There was no significant difference in scores for 2020 (M=.2020, SD=1.10) and

2021 (M=.1344, SD=1.04); t (855) =.924, p=.356, two-tailed). The magnitude of the differences in the means (mean difference=.068, 95% CI [-.077, .211] was very small (eta squared=.009). The alternative hypothesis is not supported by these data.

To determine if there was a statistically significant difference between the average growth from the Fall aMath assessment to the Winter aMath assessment in 2020 and 2021, a one-way ANOVA was employed. Table 4.3 shows the results of a one-way ANOVA test comparing the average growth between the two years. No statistically significant difference was found (*p >.05). Again, the alternative hypothesis is not supported by these data.

Table 4.3 aMath ANOVA

Results of a One-Way ANOVA Comparing Average Growth on aMath Assessments for 2020 and 2021

	SS	df	MS	F	Sig.
Between Groups	.978	1	.978	.853	.356*
Within Groups	980.079	855	1.146		
Total	981.057	856			

*p > .05

In order to further answer the first research question for the study, student academic achievement on the Fall and Winter aReading assessments were analyzed using a one-way ANOVA. This test was conducted for the study to investigate if there was a statistically significant mean difference in aReading scores while using the online mindfulness intervention (Fall and Winter 2020) and while not using the online mindfulness intervention (Fall and Winter 2021). See Tables 4.5 and 4.6 below.

Table 4.4 aReading

aReading Scores

	N	Mean	SD	SE	Minimum	Maximum
Fall 2020	405	549.458588	19.5125443	.9695861	464.3846	596.2664
Winter 2020	405	550.362148	20.9000244	1.0385306	405.3450	585.8993
Fall 2021	501	550.483106	20.2681495	.9055141	460.8323	592.7905
Winter 2021	501	551.572966	21.4683000	.9591329	371.7280	606.7967
Total	1812	550.528416	20.5817605	.4835077	371.7280	606.7967

The average aReading score increased each year between the Fall and Winter assessments, Fall 2020 M=549.46, Winter 2020 M= 550.36, Fall 2021 M= 550.48, and Winter 2021 M= 551.57(see Table 5).

Table 4.5 aReading Growth

aReading Average Growth from Fall to Winter Assessments

	N	M	SD	SE
2020 Growth	405	.288956	5.2476514	.2607579
2021 Growth	501	.331740	3.5173820	.1571450

The average growth between Fall and Winter aReading assessments is shown in Table 4.5. The students in 2020 showed a lower average growth (M=.289) than in 2021(M=.332). An

independent-samples t-test was conducted to compare the aReading score growth for 2020 and 2021. There was no significant difference in scores for 2020 (M=.289, SD=5.25) and 2021 (M=.332, SD=3.51); t (904) =-.146, p=.884, two-tailed). The magnitude of the differences in the means (mean difference=-.043, 95% CI [-.617, .531] was minimal (eta squared=.0002). These data do not support the alternative hypothesis.

To determine if there was a statistically significant difference between the average growth from the Fall aReading assessment to the Winter aReading assessment in 2020 and 2021, a one-way ANOVA was employed. Table 4.6 shows the results of a one-way ANOVA test comparing the average growth between the two years. No statistically significant difference was found (*p >.05). Again, the alternative hypothesis is not supported by these data.

Table 4.6 aReading ANOVA

Results of a One-Way ANOVA Comparing Average Growth on aReading Assessments for 2020 and 2021

	SS	df	MS	F	Sig.
Between Groups	.410	1	.410	.021	.884*
Within Groups	17311.278	904	19.150		
Total	17311.688	905			

*p > .05

Research Question 2: Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021?

$H2_o$: There is no statistically significant difference between students' attendance in Fall 2020 and Fall 2021. The attendance data provided by the school included the percentage of present students for the Fall semester of 2020 and the Fall semester of 2021. The researcher used

the average percentage of students present during the semester to use in the statistical test. A z-test of two proportions revealed no statistically significant differences in the proportion of students present between Fall 2020 (proportion = .9184) and the Fall 2021 (proportion =.9197), z= .0764, p = .9362. Hence, the null hypothesis was retained at an alpha level of .05. The findings of the z-test of two proportions are listed in Table 4.7.

Table 4.7 Attendance z-test

z-Test of Two Proportions-Attendance Comparison Between Fall 2020 and Fall 2021

Year	Fall 2020 n= 486 *proportion*	Fall 2021 n= 545 *proportion*	*z*	*p*
	.9184	.9197	.0764	.9362*

*$p > .05$

Research Question 3: Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021?

$H3_0$: There is no statistically significant difference in the number of behavior referrals for students in Fall 2020 and Fall 2021. The school provided data on behavioral referrals for the Fall of 2020 and the Fall of 2021. During the Fall of 2020, the school reported 18 behavioral incidents stemming from the behavior of 25 students. The referrals resulted from incidents such as assault, truancy, disruptive behavior, inappropriate computer use, and tobacco. The students involved included both females and males from various races and ethnicities. During the Fall of 2021, there were 163 reported incidents stemming from the behavior of 121 total students. The referrals were a result of incidents such as assault, truancy, disruptive behavior, inappropriate computer use, tobacco, stealing, and making threats. Students receiving behavior referrals included females and males from various races and ethnicities. See Table 4.8

for behavior data. A z-test of two proportions revealed a statistically lower percentage of students with behavior referrals during the Fall of 2020(proportion = .037) than the Fall of 2021 (proportion = .299), z = -11.04, $p < .001$. The null hypothesis was rejected at the alpha level of .05. The results of the z-test of two proportions are listed in Table 4.9. It is important to note that some students were attending the remote option of school during the fall of 2020, and thus, classrooms were less populated. The apparent significance shown in Table 4.10 is discussed further in the Limitations section of Chapter 5.

Table 4.8 Behavior Data

Behavior Referral Data

Event Type	Fall 2020		Fall 2021	
	n	*%*	*n*	*%*
Truancy	6	33	1	.6
Assault	2	11	9	5.5
Behavior	5	27	139	85
Inappropriate Computer Use	1	5	1	.6
Tobacco	3	17	1	.6
Theft	0	0	4	2.5
Threat	0	0	8	5

Table 4.9 Behavior z-test

z Test of Two Proportions-Behavioral Referral Comparison Between Fall 2020 and Fall 2021

Year	Fall 2020 n= 486 *proportion*	Fall 2021 n= 545 *proportion*	*z*	*p*
	.037	.299	-.11.04	<.001*

*Statistically significant at the .05 level

Research Question 4: Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021?

$H4_o$: There is no statistically significant difference between the MySAEBRS scores for students in Fall 2020 and Fall 2021. In order to answer the final research question for the study, student mySAEBRS assessments from the Fall and Winter of 2020 were used to compare students' social, academic, emotional, behavior risk scores with the mySAEBRS scores of students from the Fall and Winter of 2021. Data were analyzed using a one-way ANOVA using the growth calculated by the assessment system (the difference between the Fall and Winter scores), the average growth between the Fall and Winter assessments was also analyzed using an independent samples t-test.

Table 4.10 mySAEBRS Scores

mySAEBRS Scores

	N	M	SD	SE	Minimum	Maximum
Fall 2020	315	41.9079	6.24814	.35204	25.00	59.00
Winter 2020	315	41.9016	7.20579	.40600	21.00	60.00
Fall 2021	375	41.2960	7.39311	.38178	21.00	59.00
Winter 2021	375	40.5227	8.10518	.41855	20.00	60.00
Total	1380	41.3638	7.32670	.19723	20.00	60.00

The average mySAEBRS score decreased each year between the Fall and Winter assessments, Fall 2020 M=41.9, Winter 2020 M= 41.9, Fall 2021 M= 41.2., and Winter 2021M=40.5. The average growth between Fall and Winter mySAEBRS assessments is shown in Table 4.11 below. The students in 2020 showed a higher average growth (M=-.0001) than in 2021(M=-.0661).

Table 4.11 mySAEBRS Growth

mySAEBRS Average Change from Fall to Winter

	N	M	SD	SE	Minimum	Maximum
2020	315	-.000100	.3457374	.0194801	-1.0825	.9286
2021	375	-.066112	.4019052	.0207543	-1.9167	1.7500
Total	690	-.035976	.3784683	.0144080	-1.9167	1.7500

To determine if there was a statistically significant difference between the average growth from the Fall mySAEBRS assessment to the Winter mySAEBRS assessment in 2020 and 2021, a one-way ANOVA was employed. Table 4.12 shows the results of a one-way ANOVA test comparing the average growth between the two years. A statistical significance was found (p <.05) in the difference in the average change in mySAEBRS scores between 2020 and 2021.

Table 4.12 mySAEBRS ANOVA

Results of a One-Way ANOVA Comparing Average Growth on mySAEBRS Assessments for 2020 and 2021

	SS	df	MS	F	Sig.
Between Groups	.746	1	.746	5.240	.022*
Within Groups	97.945	688	.142		
Total	98.691	689			

*Statistically significant at the .05 level

Summary

The purpose of this quantitative quasi-experimental study was to examine if there were statistically significant differences in student academic performance, attendance, behavior, and social-emotional growth during a semester in which students were using an online mindfulness intervention and one in which they were not. In this chapter, the data collection and analysis findings were presented. Frequencies and percentages were used to examine the trends of the demographic variables. Means and standard deviations were used to describe the trends in the variables. One-way ANOVAs and two proportion z tests addressed the research questions.

Findings indicated that students increased their aMath scores during the semester in which they were using the online mindfulness application, but these changes were not statistically significant. They showed an overall decrease (not statistically significant) in aReading scores during the semester they were using MyLife for Schools. Student absence percentages were lower, but not statistically significantly lower during the Fall of 2020, during which the online mindfulness application was being used. Findings indicated a statistically significant difference in the number of behavior referrals during the two semesters, limitations to this finding are discussed in Chapter 5. There were statistically significant differences was in the changes of Social-Emotional Growth (mySAEBRS scores) during the two semesters, with the students showing a statistically significant amount of greater social-emotional growth during the semester in which the mindfulness intervention was utilized.

In the next chapter, the data analysis findings are explored with connections to the literature. Limitations and suggestions for future research are provided. The conclusions, implications, and recommendations are also presented.

Chapter 5 - Discussion and Recommendations

Introduction and Summary of Study

The Covid-19 pandemic had an undeniable impact on the education system in the United States and on students' mental health. Although many of the COVID-19-induced impacts to education remain to be seen, early data suggest troubling signs, according to Hamilton and Ercikan (2022). These same authors suggest these impacts are likely to be especially pronounced for groups of students that have been historically underserved by the education system. Research suggests that chronic stress has enduring effects on the brain, which can negatively impair memory and increase the likelihood of generalized anxiety, panic, and major depressive disorders during adulthood (Keenan et al., 2008; Lupien et al., 2009; Pine et al., 1999). Research suggests that opportunities for supporting students' social-emotional development can positively affect academic outcomes (Greenberg et al., 2003; Gumora & Arsenio, 2002; Malecki & Elliott, 2002; Welsh et al., 2001; Wood, 2006). Studies have shown that effective coping strategies can protect individuals from mental health problems when dealing with acute stressors such as those caused by the Covid-19 Pandemic (Xu & He, 2012). Adolescence is a critical period to intervene by teaching stress reduction skills (Blakemore & Mills, 2014). One of those potential stress-reducing activities is mindfulness. Teaching mindfulness to adolescents has the potential to buffer the harmful effects of environmental stressors that many of these students face daily. Viglas and Perlman (2018) observed that mindfulness practices improved the development of self-management in young children. Moulton et al. (2019) found a relationship between self-management and the student outcomes of academic performance, attendance, and behavior.

Implementing mindfulness-based interventions in schools is widely accepted (Zenner et al., 2014). However, most mindfulness-based interventions implemented in school settings use a

face-to-face format, which requires time, planning, training and places the burden of intervention on teachers (Semple et al., 2017; Zenner et al., 2014). On the other hand, online mindfulness-based interventions reduce many of these barriers because of the lessened time commitment, planning, and training, as well as placing the responsibility of the intervention on the students by providing information as needed individually (Spijkerman et al., 2016). Early studies of online mindfulness-based interventions have shown them to be as effective as face-to-face interventions (Levin et al., 2014; Sevilla-Llewellyn-Jones et al., 2018; Spijkerman et al., 2016). However, the current literature is limited regarding online mindfulness-based applications as interventions in high school settings (Carsley et al., 2017; Dauden Roquet & Sas, 2018; Felver et al.,2015).

For the present study, the researcher examined if there were differnces in student academic performance, attendance, behavior, and social-emotional development during a semester in which students were utilizing an online mindfulness intervention and one in which they were not. The online mindfulness intervention used for this study was a product called MyLife for Schools. MyLife for Schools was an intervention provided to the research site free of charge for the 2020-2021 school year. Before conducting the study, the researcher examined previous literature related to adolescent mental health, mindfulness, school based-mindfulness, online mindfulness, academic performance, attendance, student behavior, and the MyLife for Schools platform.

The researcher conducted a quantitative quasi-experimental ex post facto study to answer the research questions. The first and fourth research questions in the current study were answered using a one-way ANOVA to study the changes in student academic performance and social-emotional growth. The second and third research questions were answered utilizing two-proportion z-tests to analyze the differences in student attendance and behavior.

This chapter includes answers for each of the four research questions and interpretations of each finding. The chapter contains conclusions based on the researcher's major findings, a description of the study's limitations, and recommendations. Finally, the researcher provided recommendations for future research.

Summary of Findings and Conclusion

Research Question 1. Is there a statistically significant difference in student academic achievement as measured by aReading and aMath scores, in Fall 2020 and Fall 2021? To answer this question, the researcher looked at the changes in the aReading and aMath scores from the Fall to Winter administrations during the online mindfulness intervention (2020) and the year following (2021) when there was no mindfulness intervention. There was an average positive change in the scores from the Fall to Winter administrations for both years. Additionally, for both aMath and aReading, the mean scores indicated statistically significant growth between the Fall and Winter Administrations for both years. A one-way ANOVA test was conducted to look at the difference in academic growth during the Fall of 2020 compared to 2021. No statistically significant difference was found ($p > .05$) between the average growth scores from the 2020-2021 school year to the 2021-2022 school year.

The researcher found that there was not statistically significant difference in students' academic performance during the time period when students were utilizing online mindfulness and when they were not. This is inconsistent with the research from Bakosh et al (2016), who found statistically significant gains in reading and science in their quasi-experimental study, the researchers examined the impact of a daily mindfulness program on academic performance in third-grade students. As a result of their study, Bakosh et al., (2016) concluded that the Mindfulness-Based SEL program generated positive improvements in academic performance.

Other researchers found similar positive results in academic performance associated with mindfulness programs. Schonert-Reichl et al. (2015) found improved math performance for fourth- and fifth-grade students who participated in the MindUp program and Franco et al. (2010) found significant improvement in academic performance in their randomized trial with high school students using mindfulness. The researcher believes these inconsistencies with her findings may be due to other factors impacting the results of this research question. Of most significance is the the interrupted learning experienced by many students due to the COVID-19 school shut down. The students in the Fall of 2020 were back in school for the first time since the Spring before and many of them did not finish their 8th grade curriculum before starting 9th grade. It is likely that the aMath scores and aReading were impacted by this. While the students in the Fall of 2021 also experienced school closures, they did so during their 7th grade year and had a full year of school to recover learning before taking their 9th grade FASTBridge Assessments.

Research Question 2. Is there a statistically significant difference in student attendance in Fall 2020 and Fall 2021? The attendance data provided by the school included the percentage of present students for both the Fall of 2020 and the Fall of 2021. A z-test of two proportions revealed no statistically significant differences in the average proportion of students present between the Fall of 2020 during the implementation of MyLife for Schools and the Fall of 2021.

There was not statistically significant difference in student atttendance found between the semester that students were using MyLife for Schools and that in which they were not. This finding is not consistent with previous research on mindfulness and student attendance. In 2020, Kanopka et al. looked at the relationship between SEL competencies, including those taught

through mindfulness, such as self-management and attendance in fourth through 12th graders at five school districts. They found a positive relationship between the students' self-rating and attendance. Caballero et al., (2019), studied the mindfulness levels of middle school students and concluded that there was a correlation between greater levels of mindfulness and better attendance and in their research, Moulton et al. (2019), stated they found a relationship between self-management and the student outcomes of academic performance, attendance, and behavior. The inconsistency with other research may be explained by the impact of the COVID-19 pandemic. During the 2020-2021 school year, COVID-19 was still greatly impacting the school. There were numerous students attending school remotely which likely impacted attendance. Teachers still took attendance for the remote students each hour, as they zoomed into their classes, but it is likely were able to be “present” or attend class via zoom when they were not feeling well, were traveling, or just other general times they would have otherwise missed if they were not working from home. During both the 2020-2021 and 2021-2022 school year, the district was following a strict quarantine protocol which also likely had an impact on the number of students present each day.

Research Question 3: Is there a statistically significant difference in student behavior in Fall 2020 and Fall 2021? The researcher performed a two-proportion z test to determine differences in the percentage of students with behavior referrals for the Fall of 2020 and the Fall of 2021. The school provided the number of students with behavior referrals for the year during the implementation of MyLife for Schools (2020-2021) and the year following (2021-2022). The two-proportion z-test revealed a statistically significantly lower percentage of students with behavior referrals during the implementation of MyLife for Schools (3.7%) compared to the Fall of 2021 (29.9%).

The researcher of the current study found that during the semester in which studens were using MyLife in Schools, there was statistically significant positive difference in the number of student behavior referrals. This is consistent with much of the current research that shows a decrease in negative behaviors, an increase in positive behaviors, or both as a result of mindfulness programs. For example, Martinez and Zhao (2018) determined that mindfulness training provided students with support for managing their own behavior. Schonert-Reichl et al. (2015) studied a program that incorporated mindfulness and determined that it held promise for encouraging positive student behavior in elementary students. In the study conducted by Bakosh et al. (2015), the impact of mindfulness practices on classroom behavior was analyzed by having teachers in intervention and control classrooms track behavioral incidents for 8 weeks. The mean incidents of disruptive behavior fell by over 50% for the intervention group and rose by 15% for the control group over the 8 weeks. Additionally, Flook, et al., (2015) found that children who were part of the school-based mindfulness program showed gains in behavioral regulation, metacognition, and overall global executive control. While the current study showed statistically significant relationship differences in regards to student behavior, it is important to note that some of the students were attending school remotely during the 2020-2021 school year, and the lower number of students present in the building likely impacted the number of behavior referrals. This is discussed further in the Limitations section of this chapter.

Research Question 4: Is there a statistically significant difference in student social emotional development as measured by mySAEBRS, in Fall 2020 and Fall 2021? To answer this question, the researcher looked at the changes in the mySAEBRS scores from the Fall to Winter administrations during the online mindfulness intervention (2020) and the year following (2021). There was an average positive change in the scores from the Fall to Winter

administrations for both years. Additionally, the mean scores indicated statistically significant higher mean scores each year. A one-way ANOVA test was conducted to look at the difference in social and emotional growth between the Fall of 2020 and 2021. A statistical significance was found (p <.05) in the difference in the average change in mySAEBRS scores between 2020 and 2021.

The researcher of this study found that there was a statistically significant difference between the mySAEBRS scores during the semester that students were using MyLife for Schools and the semester in which they were not. The work of de Carvalho et al. (2017) echoes this study's findings, as their research found that students participating in a mindfulness program were better able to regulate their emotions and exhibit self-compassion. Viglas and Perlman (2018) observed that mindfulness practices improved the development of self-management in young children. The findings of this study were also consistent with the work of Flook et al. (2010) who examined the impact of a mindfulness intervention that included focused attention on the breath, and self-reflection. Bluth et al. (2016), found a statistically significant difference in depression between the intervention and control groups and saw changes in anxiety suggesting that the intervention group decreased in anxiety, whereas the control group increased over the course of a school year. Reductions in depression and anxiety through mindfulness interventions have also been reported in other studies with adolescents (Kuyken et al., 2013; Sibinga et al., 2013).

Implications

A greater understanding of online mindfulness platforms and the potential impact on adolescent mental health is crucial. Education has been moving toward more online delivery (Palvia et al., 2018), and now, during the COVID-19 epidemic, where education delivery occurs

via online or hybrid classes, this study is even more timely. As noted in Chapter 1, there is very little in the body of knowledge about online mindfulness interventions with high school students. This study's results contribute knowledge about online mindfulness interventions suggesting that they can be an effective intervention for high school students. Mental health, academic achievement, and emotional competence are intertwined (Zenner et al., 2014). Schools are responsible for fully educating their students, including meeting their non-academic needs (Waters et al., 2015). The present study's findings add to the literature on online mindfulness programs and their potential impacts on students' academic performance, attendance, behavior, and social-emotional growth.

Theoretical implications. There is a need to develop and test evidence-based interventions that can help build resilience, help people cope with the current situation, and help to prevent future emotional and mental health problems. Such interventions should also be low-cost and easy to deliver in various formats. Naeem et al. (2020) believe that Cognitive Behavior Therapy, the theoretical framework of this study, and third wave CBT approaches, such as mindfulness, are the ideal intervention for this task. Through mindfulness, students can learn to identify feelings and cope with them in a healthy and balanced way. The ability to monitor and control one's thoughts, behaviors and emotions plays an important role in many areas of life, including school-related outcomes. Mindfulness practice requires a person to notice their thoughts in the present moment and accept those thoughts without trying to change the thoughts or engage in action. As Kabat-Zinn (2011) emphasized, mindfulness practices use focused concentration to stay in the present moment and suspend distracting thoughts. Through this mindfulness-based interventions often target self-regulation. Self-regulation has been found to be related to a number of outcomes important to student success in school, such as externalizing and

internalizing problems, classroom behaviors and disciplinary incidents, and math and reading (Berking & Wupperman, 2012; Richardson et al., 2012; Wyman et al., 2010).

Schools often justify the implementation of socioemotional programs, including mindfulness-based training, on the premise that those programs will, in turn, promote positive behavior, improve academic achievement, reduce mental health symptoms, and improve socioemotional well-being. The present study supported this mission in showing statistically significant positive social-emotional growth in students during at time in which they were using the online mindfulness platform.

Practical implications. The findings in this study did not support a relationship between the use of an online mindfulness platform and student academic performance or attendance. However, and of great importance, the study did show a statistically significant positive difference in the social-emotional growth of students during the semester in which they were utilizing mindfulness. The need for effective, proactive, systemic social-emotional supports in schools cannot be overstated. Schools are uniquely positioned to provide students with proactive systemic mental health support to give them the tools necessary to succeed academically and emotionally in school and beyond. Unfortunately, research has shown that time and teacher training is two constraints that hinder the implementation of mindfulness-based interventions in school settings (Zenner et al., 2014). The ability to implement an intervention that requires minimal teacher training, has very little disruption to normal class time, and is accessible to students 24/7 is worthy of attention. Online mindfulness platforms will enable students to have direct access to the intervention to use at their convenience, during school as well as in their personal lives. Providing students with the supports to learn to self-regulate and grow in their social-emotional development is an important endeavor. As evidenced in the current study,

providing access to online mindfulness platforms may help students' social-emotional growth, which could, in turn, help students manage their emotions in balanced and healthy ways.

Future implications. The present study revealed significant differences between the behavior referrals and the social-emotional growth of students using the online mindfulness application versus those who were not. Follow-up research is necessary to determine the effect of online mindfulness interventions Further research should explore specific groups and look at the differences amongst various demographics. Also, more rigorous research designs addressing the limitations of this study should be considered.

Limitations

According to Gay et al. (2012), limitations are “aspects of the study that the researcher cannot control but believes may negatively affect the results of the study” (p. 115). Several such limitations existed in this study. While the study findings provided initial support for online mindfulness applications in behavior and social-emotional growth, there are several limitations to consider when interpreting the study's results. One such limitation was the scope of the research study. The initially planned scope was narrowed due to the impact of the COVID-19 Pandemic. In March 2020, a novel virus, COVID-19, disrupted the 2019-2020 school year, making it almost impossible to use any archival data from the 2019-2020 school year as part of the study. The study was also limited by the lack of oversight during the meditation program. All study participants were self-monitored, and while cued to use the MyLife application, they were not checked for intervention fidelity as participants were not monitored as to the number of actual days and minutes per day, they practiced mindfulness.

Recommendations

This study yields several recommendations for future research. These recommendations include similar studies with varied populations, mixed-method explorations, and different mindfulness applications. Based on the study results and the strengths and weaknesses, recommendations for future studies are suggested. The information revealed by the present study makes it evident that more research on the use of online mindfulness applications as an intervention for adolescents is warranted.

Recommendations for future research. The results of this study suggest there is a need for further research in online mindfulness interventions with adolescents. School settings are appropriate for implementing proactive mental health interventions because students spend a significant part of their developmental years there (Zenner et al., 2014). Future research can be expanded to include participants from multiple high schools in various settings. Further researchers should also explore specific groups such as underrepresented students, low socioeconomic status students, and students with learning disabilities. This information could help researchers and educators understand how mindfulness impacts different student groups within a school. Another recommendation for future research is to use mixed-methods study designs to gain a qualitative and quantitative understanding of mindfulness. A mixed-method study could include interviews and analysis of journal entries in addition to quantitative data. Through this, a researcher could look at the perceptions of practicing mindfulness and information regarding the actual practice of mindfulness itself. The current study's purpose was not to evaluate a product, and MyLife for Schools was chosen for its accessibility in the research school. However, numerous online mindfulness applications and platforms are available and are currently being developed. Exploring the efficacy of different applications could provide

information on which applications are most acceptable to high school students, teachers, and schools.

Recommendations for future practice. Based upon the results of this study and support of the literature about mindfulness, online mindfulness applications are potentially beneficial to high school students' behavior and social-emotional growth. Because not all schools can implement and provide face-to-face mindfulness programs, this study provided important information about online mindfulness platforms. Most high school students have access to technology and, therefore, access to online mindfulness platforms. Schools may consider the following recommendations for implementing the use of mindfulness applications. The first recommendation is to have a consensus about the application used and build consistency through school-wide buy-in. A school-wide mindfulness application will help students and staff share a common language about mindfulness practice. The second recommendation is to promote the application's use at the beginning of the year and continuously remind students about their access to the application, considering normalizing its use throughout the school day. For example, teachers could dedicate the first or last ten minutes of class to practice mindfulness. They could cue students to use the application during breaks or before a test. The researcher also recommends taking the time to explicitly teach students about mindfulness and how to access and use the online platform and provide opportunities for students who need help accessing or using the application.

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Appendix A - MyLife for Schools Contract

[MYLIFE LOGO]

MYLIFE FOR SCHOOLS ORDER FORM

Subscriber:	**MHS East Campus**
Subscriber Contact Information	**David Holloway- (785)537-2150** **davidh@usd383.org** **Jana Biery- (785) 587-2000** **janabi@usd383.org** **901 Poyntz Ave** **Manhattan, KS 66502**
Services:	**MyLife for Schools will be accessible to all students whom licenses have been purchased.**
Supported Environment:	Each school will need to provide internet connectivity as well as a device per student to access MyLife for Schools. The program will need to be accessed through a Chrome Browser. Although not required, we recommend that each student also utilize headphones to access during school hours.
Limitations on the Use of the Services:	**Subscriber will be limited to 500 licenses. Sharing of license is prohibited.**
Incremental Licenses	**Subscriber may purchase more licenses at a cost of $7.00 per license throughout the year.**
Initial Term:	**July 1, 2020 through June 30, 2021**
Fees and Invoice Schedule:	**Total Cost: $4000; provided, no fee shall be owed if Subscriber provides notice to MyLife for Schools of its intent to terminate prior to October 15, 2020.**

This Order Form is by and between MyLife for Schools, a division of Meredith Corporation ("MyLife for Schools") and the entity listed as Subscriber above, and is governed by the Terms and Conditions of MyLife for Schools Services attached hereto ("Terms and Conditions," along with this Order Form, collectively, the "Agreement"). Except as otherwise defined herein, all capitalized terms used in this Order Form shall have the meanings attributed to them in the Terms and Conditions, which are hereby incorporated by reference into this Order Form.

MyLife for Schools and Subscriber have caused this Agreement to be executed by their duly authorized representatives as of the date of the later signature below ("Effective Date").

MyLife for Schools
11766 Wilshire Blvd. Suite 1800
Los Angeles, CA

MHS East Campus
901 Poyntz Ave
Manhattan, KS 66502

By:_____

Name:_____

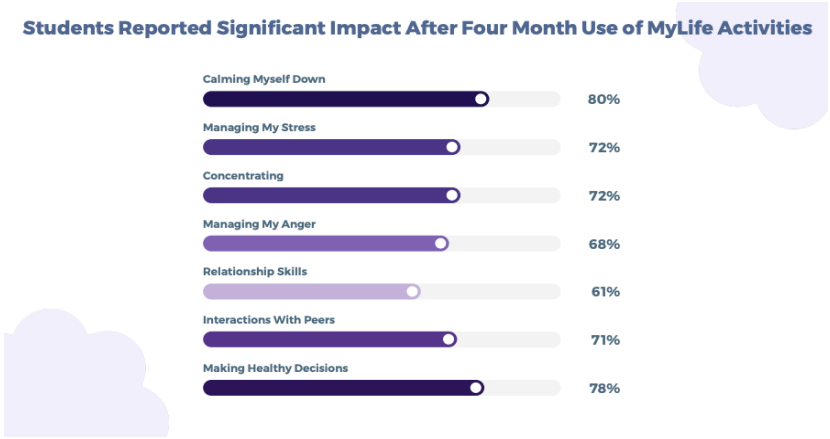
By: David Holloway

Name: Dan Holloway

Appendix B - Parent Letter

Dear Parent/Guardian-

We are excited to share with you that Manhattan High School East Campus has chosen to partner with MyLife for Schools, an award winning mindfulness program that supports the core competencies of Social Emotional LearningMyLife for Schools is a web-based mindfulness application for classroom and student at-home use. Students check-in regularly with how they're feeling and MyLife recommends short mindfulness activities tuned to their emotions. We're thrilled to use this program to provide students with a personalized experience that will help create a more calm, focused and kind school environment.



We are excited about the new implementation of MyLife for Schools to better support your child's academic achievement and emotional well-being.

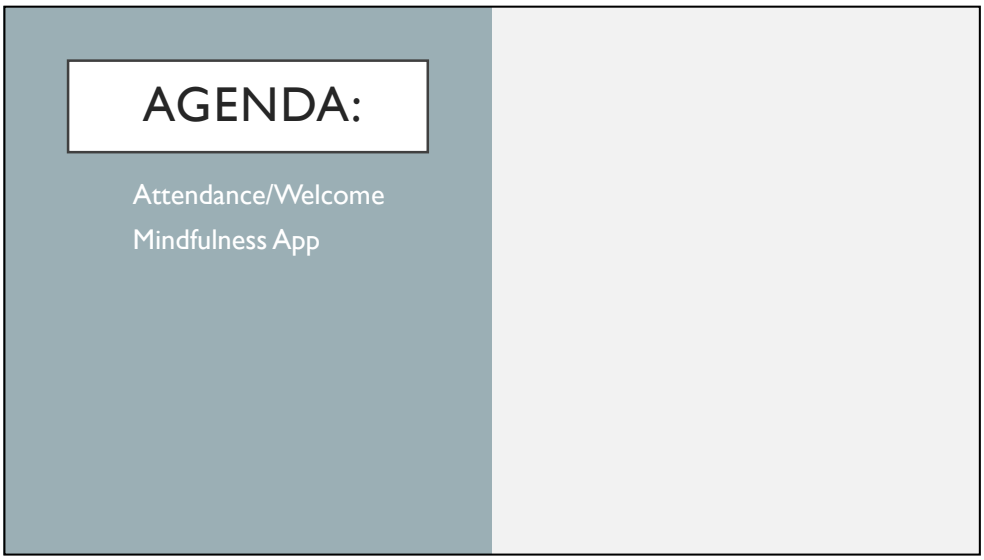
Any questions can be directed to janabi@usd383.org.

Sincerely,

Appendix C - Advisory Lesson

3/18/22

1



2

WELCOME!

3

MYLIFE FOR SCHOOLS

- This year we are going to use some mindfulness activities to help deal with all the craziness and stress we are all feeling
- We are using a platform called MyLife for Schools to access thousands of mindfulness, breathing, and stress relief activities
- You will get to choose which activities you do based on how you are feeling each day
- You can use this website whenever you want on any device that has internet!

4

What is mindfulness?

5

Mindfulness is a way of paying attention to what is happening right now, by observing what's going on inside (your thoughts, feelings, physical sensations) and outside (your interactions and surroundings) with openness and a sense of curiosity.

mind full or mindful?

6

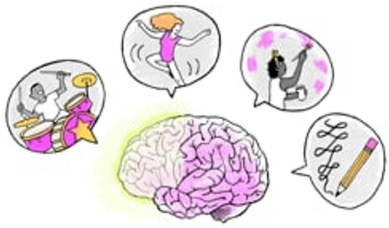
Big thoughts Big Emotions

7

8

Let's begin by taking a look at the human brain and how it has evolved over time to give you control over your thoughts and emotions

https://vimeo.com/365366872



9

WHAT IS MYLIFE FOR SCHOOLS?

MyLife For Schools

https://vimeo.com/452634895

10

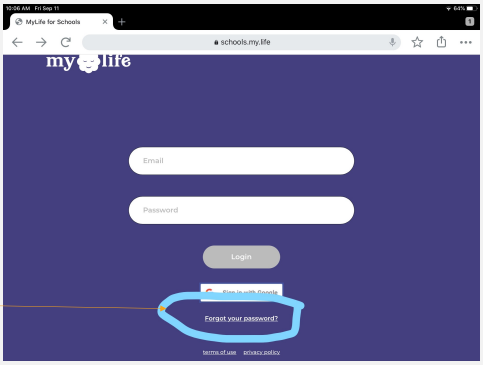
DIRECTIONS

- Download Google Chrome if you haven't already
- Open Chrome (this site ONLY works with Google Chrome)
- Go to schools.my.life
- Bookmark this site by clicking on the star in the corner. We will be using this site numerous times a week so you will want to keep it handy!
- You are going to have to reset your password, so get ready for lots of directions!!

11

DIRECTIONS FOR LOGGING IN

Click on "Forgot your Password?"



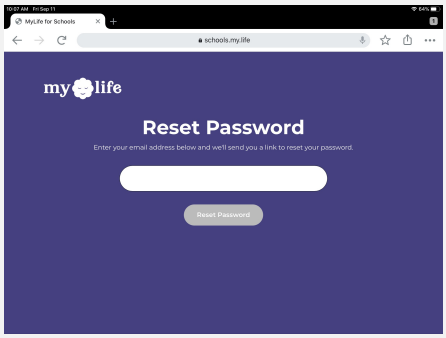
Click here

12

TYPE YOUR SCHOOL EMAIL ADDRESS IN THE BOX

Your email is the first seven letters of your first name the first seven letters of your last name and your graduation year @usd383.org (ask your teacher for help if you need it!)

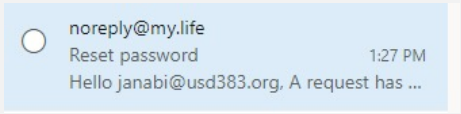
Example: janesmith24@usd383.org



13

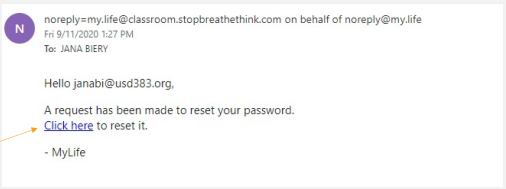
GO OPEN YOUR SCHOOL EMAIL THROUGH OUTLOOK

- Open the email that looks like this:



14

CLICK ON THE LINK TO RESET YOUR PASSWORD

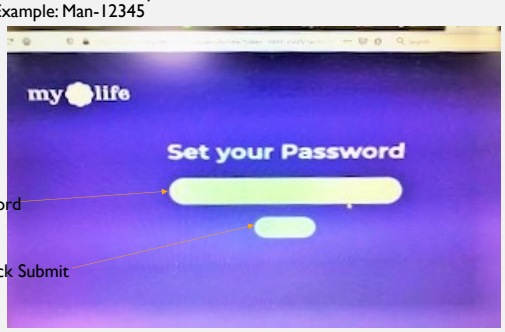


Click here

15

RESET YOUR PASSWORD TO YOUR SCHOOL PASSWORD:

Your Password: Man-your student number
Example: Man-12345

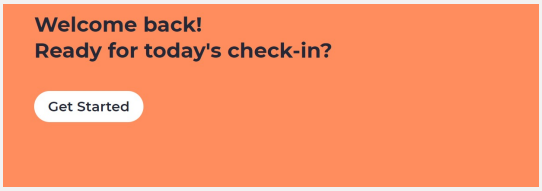


Type password

Click Submit

16

WATCH THE CHECK IN VIDEO:



- Watch the video to explain the check in process! You can stop the video when they start to talk about the teacher side of things at about 3:30
- https://vimeo.com/396035777#t=49s

17

LOG IN TO YOUR ACCOUNT AND GET STARTED!

- Do your check in and pick an activity that you'd like to try
- You can use your MyLife account anytime you want on any device!

18

Appendix D - IRB Exemption Waiver

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: Judith Hughey
Spec Ed, Counsel & Student Aff
Manhattan, KS 66506

Proposal Number: IRB-11014

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 02/03/2022

RE: Proposal Entitled, "The Effect of Mindfulness on Social Emotional Growth."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §104(d), category:Exempt Category 4 Subsection i.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Electronically signed by Rick Scheidt on 02/03/2022 5:00 PM ET

203 Fairchild Hall, Manhattan, KS 66502 | (785) 532-3224 | fax: (785) 532-3278