2023

Effects of Mindfulness-Based Intervention on Mental Health Outcomes in Youth Who are Underserved

Melanie Grace Albright
University Of Alabama At Birmingham

EFFECTS OF MINDFULNESS-BASED INTERVENTION ON MENTAL HEALTH OUTCOMES IN YOUTH WHO ARE UNDERSERVED

by

MELANIE GRACE ALBRIGHT

HEATHER AUSTIN, COMMITTEE CO-CHAIR
SYLVIE MRUG, COMMITTEE CO-CHAIR
CHRISTOPHER HENRICH
CAROLINE GREINER RICHTER
TINA SIMPSON

A DISSERTATION

Submitted to the graduate faculty of The University of Alabama at Birmingham,
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy

BIRMINGHAM, ALABAMA

2023

EFFECTS OF MINDFULNESS-BASED INTERVENTION ON MENTAL HEALTH OUTCOMES IN YOUTH WHO ARE UNDERSERVED

MELANIE GRACE ALBRIGHT

DEVELOPMENTAL PSYCHOLOGY

ABSTRACT

Adolescence, a period of rapid brain maturation and development coincides with the development of mental health disorders. Many teens in the United States with diagnosable mental health conditions lack mental health treatment due to limited access and provider availability, particularly affecting adolescents who are underserved. School-based interventions, including those centered around mindfulness-based stress reduction (MBSR) have shown promise in their effectiveness among adolescents. This study examines the impact of an in-school MBSR-based program, MindUP, on mental health outcomes, including depressive symptomology, anxiety symptomology, and perceived stress, in adolescents who are underserved. Additionally, focus group discussions were conducted with students participating in the MindUP group. No significant group differences in mental health outcomes over time were found. Additionally, perceived program credibility was not related to change in mental health outcomes over time for those in the MindUP group, though perceived credulity itself did increase throughout the program. Focus group discussions revealed overall acceptability regarding the program and improvements to be made for the future. This work may inform future research on the impact of in-school mindfulness-based interventions on mental health outcomes of

youth who are underserved and guide efforts to implement school-based MBSR programs to enhance resources for student mental health.

Keywords: Adolescence, youth who are underserved, mental health, mindfulness-based stress reduction, in-school

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure *Page*

LIST OF ABBREVIATIONS

ACEs	Adverse Childhood Experiences
GAD-7	Generalized Anxiety Disorder - 7
HBM	Health Belief Model
MBSR	Mindfulness-Based Stress Reduction
MBI	Mindfulness-Based Intervention
OLS	Ordinary Least Squares
PSS-C	Perceived Stress Scale – Child
SCARED	Screen for Childhood Anxiety Related Emotional Disorders
SCT	Social Cognitive Theory
SD	Standard deviation
SEL	Social Emotional Learning
SMFQ-C	Short Mood & Feelings Questionnaire - Child
WHO	World Health Organization

INTRODUCTION

Adolescent Mental Health and Development

Adolescence is characterized as a period of rapid brain maturation (Fuhrmann et al., 2015). The adolescent years are also a pivotal time of development as humans transition from childhood to adulthood physically, mentally, and emotionally (Hamburg & Takanishi, 1989). Early research on the adolescent life stage has fueled the overarching belief that problematic behaviors characterize the adolescent brain and developmental stage (Galvan, 2021). However, modern research shifts the narrative to view adolescence as a developmental period of growth, opportunity, and creativity (Crone & Dahl, 2012; Galvan, 2014).

The adolescent brain is especially malleable, rewiring itself based on what it absorbs and experiences (Giedd, 2015). Adolescents experience immense personal development as they learn from interacting with and experiencing their environment, relationships with others, mistakes, and successes. In many cases, this includes the exploration of the self, the influence of peers, risk-taking, and the renegotiation of relationships with parents and caregivers. This period of adaptation and change can be viewed as an "adaptive need to gain the experience required to assume adult roles and behaviors" (Romer et al., 2017).

However, adolescence is not without trials and difficulties. Shifts in mental health often present during the teen years (Paus et al., 2008). Risk-taking, often initiated by a heightened susceptibility to peer influence, can have dangerous, life-altering, and

sometimes fatal consequences (Crosnoe & McNeely, 2008). Relationships with caregivers can be complicated as teens seek more independence, outpacing their parents' and guardians' readiness and expectations (Collins et al., 1997).

Over 42,000,000 adolescents live in the United States, comprising about 13% of the population. Approximately 20% have a diagnosable psychiatric disorder (Merikangas & Burnstein et al., 2010). In general, the prevalence of diagnosable mental disorders has increased in recent years (Twenge et al., 2019). Among adolescents between the ages of 13-17, an estimated 45% experience symptoms of anxiety (Geiger & Davis, 2019). In 2020, approximately 17% of teens aged 12-17 reported at least one major depressive episode (Center for Behavioral Health Statistics and Quality, 2020). Depressive symptoms have been shown to gradually increase in early adolescence and peak in middle adolescence (Kwong et al., 2019). In a 2018 survey, 70% of teens indicated that anxiety and depression were significant problems among people their age in the community where they live, 26% stated anxiety and depression were minor problems, and only 4% stated they were not a problem at all (Horowitz & Graf, 2019). Between 2007 and 2018, the national suicide rate among adolescents aged 10-24 increased by 57%, with suicide becoming the second leading cause of death among adolescents, behind injury-related deaths (Curtin, 2020).

Despite the overwhelming need for mental health resources and care, a large percentage of individuals with diagnosable mental health conditions in the United States do not receive any mental health treatment (Fritze & Nguyen, 2021). In 2021, over half of adults with a mental illness (56%) received no treatment (Fritze & Nguyen, 2021). That same year, 60% of youth (aged 12-17) with major depression in the United States did not

receive mental health treatment. In Alabama, 67% of youth with major depression were untreated (Fritze & Nguyen, 2021). Alabama was ranked 50th in access to mental healthcare and 51st (LAST) in mental healthcare provider availability, with only one mental healthcare provider for every 920 persons in need (Fritze & Nguyen, 2021). Pediatric healthcare providers require further specialized training, contributing to an even greater scarcity of healthcare providers specializing in child and adolescent mental health (Abramson, 2022).

Mental Health in Youth Who Are Underserved

For this project, we refer to youth who are underserved as those who do not have access to equitable mental health services because they have been marginalized or underserved in society. These disparities in mental healthcare are caused by numerous factors, including socioeconomic status, identity-based discrimination, and disability status (Olden & White, 2005). Youth who are underserved are more likely to experience higher levels of stress and social pressures than their advantaged peers (Jackman et al., 2020). In addition, youth who are underserved are less likely to be connected with high-quality mental health care (Hodginson et al., 2017). This may be due to a variety of factors, including stigma related to seeking mental health support (Turner et al., 2015), ethnic and linguistic differences (Garland et al., 2005), and rates of engagement in mental health treatment by youth who are underserved (Merikangas et al., 2011).

Adolescence has been characterized as a stress-sensitive period (Fuhrmann et al., 2015). Stress occurs when the perception of an event, either internal or external, exceeds the coping threshold and signals to the body that well-being is endangered (Folkman, 2020). Chronic stress leads to a constant state of fight, flight, or freeze (Bernstein, 2016).

In this state, fear and anxiety work to shut down higher-order thinking (Vogel & Schwabe, 2016).

Stress is a normal part of life but can reach abnormal levels and become a chronic problem (McEwen et al., 2015). Chronic exposures to environmental stressors contribute to maintaining internal and externalizing disorders among young people (Grant et al., 2006). Youth who are underserved, including those who encounter poverty, discrimination, and other chronic stressors, are more likely to experience challenges to healthy development (Evans & Kim, 2012). Social determinants of health (e.g., living in under-resourced or racially segregated neighborhoods) can cause prolonged toxic stress (Centers for Disease Control & Prevention, 2019). Severe, prolonged stress depletes the body's resources and leads to the body's inability to shut down the brain's response to stress (McEwen, 2015). Additionally, the activation of cortisol production caused by stress decreases the immune system's ability to inhibit inflammatory processes (Dhabhar, 2014).

Youth who are underserved are more likely to experience adverse childhood experiences (ACEs), which are defined as potentially traumatic events that occur during childhood (between the ages of 0-17) (Felitti et al., 1998). ACEs are a wide variety of experiences, including but not limited to child abuse and neglect, household dysfunction, and experiencing or witnessing violence. Nearly 50% of US teens and adults report experiencing at least one ACE (McLaughlin et al., 2012). Women, American Indian/Alaskan Natives, and Black Americans are more likely to experience four or more ACEs than males and individuals from other racial/ethnic groups (Centers for Disease Control & Prevention, 2019).

A dose-response relationship exists between adverse childhood experiences (ACEs) and poorer life outcomes. ACEs are related to mood disorders, substance abuse, and anxiety disorders later in life (Duffy et al., 2018). The lasting effects of traumatic events can prevent individuals from forming healthy connections with other people and can deactivate structures in the brain that effectively regulate emotions (Dye, 2018).

In-School Mental Health Programming

Adolescents spend a significant portion of their time attending school; therefore, this setting provides a viable space for mental health service delivery (Hoover & Bostic, 2021). Legislative and policy developments have intended to facilitate access to in-school mental health services (Ali et al., 2019). For example, the reauthorization of the Mental Health First Aid program through the 21st Century Cures Act provides mental health awareness training for school staff and teachers to recognize and intervene when students are experiencing mental health crises (Kitchener & Jorm, 2008). However, school-based mental health programming and services are yet to be widespread throughout the US, as only about half of the nation's schools presently provide these services (National Center for Education, 2022).

One study examining the utilization of school-based mental health services on a population-level suggests that approximately one-third of adolescents seeking mental health services do so in the school setting only, and over half receive services in a school setting alone or in combination with services in a noneducational setting (Ali et al., 2019). Additionally, adolescents with public health insurance, from low-income households, or identifying as racial/ethnic minorities were more likely to access services in an educational setting only (Ali et al., 2019). Seeking services in school may mitigate

barriers to care, such as transportation barriers, seeking treatment in an unfamiliar setting, and finding a provider (Ali et al., 2019; Cummings et al., 2010). Therefore, schools may be essential in reducing disparities in mental healthcare (Cummings et al., 2010; Kataoka et al., 2007).

School-based mental health services may benefit student success and well-being in multiple ways. The findings of an international study commissioned by the World Health Organization (WHO) emphasized the positive effects of mental health programs in schools and the importance of integrating interventions promoting healthy development into the educational setting (Barry et al., 2013). Mental health services integrated into school settings also provide integrative care that supports student mental health and educational attainment (Fazel et al., 2014).

Social-Emotional Learning in Schools

One strategy for supporting student mental health in schools is social-emotional learning (SEL) programming. SEL is defined as "the process through which all young people and adults acquire and apply the knowledge, attitudes, and skills to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions" (CASEL, 2020). Adolescence is a developmental stage where individuals may need special social and emotional support (Yeager, 2017). This support may be needed due to increased attention to social cues, greater reactivity in social situations, and increased motivation to engage in social situations (Ellis et al., 2012). Educators and researchers have emphasized the importance of adding SEL as an

additional component to the core school curricula, teaching students the skills needed to develop crucial social and emotional competencies.

There is a growing evidence base suggesting that SEL programs not only improve social/emotional skills but also benefit academic functioning, mental health, and students' overall health and well-being (Dowling et al., 2019; Jones et al., 2017). A meta-analysis of 213 studies with students aged 5-18 examining the impact of SEL programs in schools suggests that well-designed and implemented SEL programs improve social-emotional skills and academic outcomes (Durlak et al., 2011).

The most effective SEL programming for adolescents is tailored to their unique developmental stage. An SEL program must honor the adolescent's desire to develop an identity, gain peer acceptance, and develop independence (Yeager, 2017). SEL programs are typically based on one of three models: the skills model, the climate model, and the mindsets model (Yeager, 2017). The skills model aims to change behaviors by revising and supplementing social-emotional skills. The climate model focuses on changing the school environment to be more supportive. Finally, the mindsets model involves creating an environment that socializes students to hold certain belief systems or mindsets.

SEL can be categorized as contemplative education, which emphasizes the development of the whole person, as opposed to traditional education with the sole focus on knowledge acquisition, development of cognitive skills, and individual achievement (Roeser & Peck, 2009). Mindfulness has been suggested as one type of contemplative practice that can deepen the development of social-emotional competencies (Greenberg, 2014). Mindfulness can improve self-awareness through developing the nature of the mind and emotional awareness; improve self-management through the practice of

emotion regulation, inhibitory control, and focused attention; social awareness through showing empathy and compassion for others; relationships skills through mindful listening, using thoughtfulness in conversations, and managing conflict; and responsible decision-making through stating facts non-judgmentally and making ethical decisions that stem from awareness and caring (Lawlor, 2016). However, there is limited research examining the integration of mindfulness into SEL programming.

Mindfulness-Based Stress Reduction

Mindfulness is defined as "paying attention in a particular way, on purpose, in the present moment and non-judgmentally" (Kabat-Zinn, 2003). Mindfulness-based stress reduction (MBSR) was originally introduced in the late 1970s by Jon Kabat-Zinn as a method of stress management for individuals experiencing chronic pain (Kabat-Zinn, 1990). Although initially developed for use with patients in a clinical setting, MBSR has become commonly used in nonclinical populations. Other methods for practicing mindfulness exist; however, the primary difference between MBSR and other mindfulness approaches is that MBSR uses regular meditation practice to develop mindfulness. Through regular, consistent mindfulness meditation practice, MBSR aims to help individuals recognize and break away from maladaptive, habitual thinking patterns and behaviors. In addition, MBSR intends to teach individuals to be less reactive and judgmental towards their own experiences, thoughts, and feelings (Kabat-Zinn, 1990).

MBSR programs typically involve weekly group sessions and encouragement of regular at-home meditation practice. The programs teach both formal and informal practices of mindfulness. Formal practice includes body scans, sitting, movement, and walking meditation. Informal practice includes mindful awareness in activities of daily

living, such as getting ready for the day, eating, driving, and spending time with others. It is imperative for mindfulness instructors to maintain a personal mindfulness practice (Kabat-Zinn, 1990, 2003; Segal et al., 2002). MBSR programs typically last 4-24 weeks and focus on three components: 1) didactic instruction on the basic concepts related to mindfulness; 2) practice of the various formal and informal mindfulness techniques; and 3) group discussions involving the application of mindfulness in daily life and problem-solving barriers to practice (Grossman et al., 2004; Kabat-Zinn, 1990).

Mindfulness has also been examined as a psychological construct separate from mindfulness interventions (Bishop et al., 2004; Shapiro et al., 2006). It has been divided into an outcome (mindful awareness) as well as a process (mindful practice). Mindful awareness includes a "deep knowing that manifests as a freedom of mind" (e.g., thinking before reacting, understanding delusional thoughts). Mindful practice is "the systematic practice of intentionally attending in an open, caring, and discerning way, which involves both knowing and shaping the mind" (Shapiro & Carlson, 2009). Three primary elements of mindfulness have been proposed by Shapiro et al. (2006): intention, attention, and attitude. Intention, as the reason behind someone's mindfulness practice, is essential because an individual's reason for practicing mindfulness is directly related to the outcomes of mindfulness practice. The attention component of mindfulness involves being present in the here and now, allowing individuals to observe their own experience both internally and externally in each moment. Further, the attitudinal foundation of mindfulness includes bringing attitudes of non-judgment, acceptance, trust, patience, non-striving, curiosity, and kindliness to the experience (Shapiro et al., 2006).

Much of the evidence on MBSR has been limited to adult populations focusing on individuals with somatic health problems, such as musculoskeletal pain or rheumatic disorders, cancer, and neurological disorders. Some studies have focused on individuals with mental health problems, including stress-related problems, anxiety, and mood disorders, as well as groups without clinical characteristics or disorders (de Vibe et al., 2017). Among youth, promising evidence has emerged suggesting that Mindfulness Based Interventions (MBIs) are effective in improving psychosocial outcomes, disruptive behaviors, regulating emotions, and academic achievement (King et al., 2011; Kostova et al., 2019; Van de Weijer-Bergsma et al., 2014; Zenner et al., 2014).

Mindfulness programs provide unique training targeting emotional regulation and social-emotional development (Broderick, 2021). This may be especially beneficial for adolescents who may need support identifying, understanding, and regulating difficult emotions experienced during this time of rapid socioemotional development. In addition, since the adolescent brain is particularly sensitive to stressful situations and circumstances, mindful strategies aid in reducing ruminative and reactive thought patterns by identifying helpful versus unhelpful thoughts contributing to stress (Perry-Parrish et al., 2016). Self-management skills taught during mindfulness support healthy autonomy-seeking behaviors and combat counterproductive interactions with authority figures, such as parents and teachers. MBSR has been consistently found to be efficacious in reducing depressive symptoms among children and adolescents in both clinical and non-clinical settings (Burke, 2010; Virgili, 2015; Zoogman et al., 2015). Previous work suggests that MBSR effectively reduces young people's anxiety symptomology when compared to conventional methods such as treatment as usual (clinical population) and

health education (non-clinical population) (Biegel et al., 2009; Sibinga et al., 2016). Among early adolescents, in-school mindfulness programs have been correlated with reductions in negative mental health outcomes including suicidal ideation and affective disturbances (Britton et al., 2014), depressive symptomology (Joyce et al., 2010), anxiety symptomology and negative coping (Sibinga et al., 2013), negative affect, rumination, and self-hostility (Sibinga et al., 2016).

Although mindfulness has been shown to be effective among both adults and youth, most mindfulness research to date has been conducted with predominantly White samples and few studies have included youth who are underserved (Proulx et al., 2018). Existing evidence suggests that youth who are underserved are less likely to engage with MBIs (Olano et al., 2015). The lack of evidence and development of mindfulness programming for youth who are underserved could contribute to the limited implementation of mindfulness-based programming in these populations (DeLuca et al., 2018). Disparities in mental healthcare stem in part from lack of inclusion and cultural adaption in mental health research (Mongelli et al., 2020). Additionally, mental health programs and treatments adapted for specific groups who are underserved are more effective than generic interventions (Griner & Smith, 2006). Therefore, it is imperative that programs are adapted to fit the needs of the population they are intended to serve.

In summary, in-school mindfulness-based interventions have been shown to improve mental health outcomes for youth. These interventions improve accessibility of mental health services as youth who are underserved are less likely to seek clinical services than school-based services and supports (Jaycox et al., 2010). School-based MBIs may be beneficial to reducing racial disparities in mental healthcare service

utilization (Fung et al., 2016). Mindfulness cultivating social-emotional competences can improve quality of care for youth who are underserved and combat the effects of mental health disparities in this population (Phan & Renshaw, 2021). Additionally, intervention adaptations are essential to ensure individuals are receiving programming relevant to their specific needs.

Implementation Science in Schools

Implementation science has been defined as "the study of how evidence-based programs can be embedded to maximize successful outcomes" (Kelly & Perkins, 2012). The strategies that make up implementation science provide evidence for the successes and failures of a program or the adoption of an intervention into new settings/contexts. This approach recognizes that interventions must be evaluated as being effective within the target setting and population. It must also be adopted with fidelity so that the program can be maintained past initial program implementation (Fixsen et al., 2005). Program implementation is influenced by the systems in place surrounding the population or implementation setting. This includes "implementation drivers" or the motivation of the individuals adopting or implementing the program coupled with the training, coaching, and reflection put into ensuring the program is properly implemented. Next are organizational influences including the allocation of time and resources by the organization (e.g., school and administration) to implement the program. Finally, there are the external influences (e.g., overarching school policy, school board) and the investment of time and resources that are allocated to a particular program. The collaboration of all these systems is imperative for a program to be successful (Maher et al., 2009).

The first step in implementation is selecting an evidence-based program. Implementation support is necessary to sustain a high-fidelity program (Chambers et al., 2013; Shelton et al., 2018). In addition, implementation fidelity must be measured and maintained throughout the program (Carroll et al., 2007). Program fidelity measures exposure, adherence, and the quality of the program implementation (Klimes-Dogan et al., 2009).

The Collaborative for Academic Social and Emotional Learning (CASEL) Framework follows a systematic implementation approach that focuses on building foundational support, strengthening the SEL competencies and capacity of adults within the school, promoting SEL for students, and reflecting on data for continuous improvement (Mahoney et al., 2021). There are many limitations to implementation science including lack of research funding or resources and/ or using research designs that are non-applicable to implementation practice (Jennings, 2023). Additionally, program implementation can take time in order to be fully embedded into everyday school life, but this can be difficult in the current educational climate in which teachers' workloads are consistently increased (Moir, 2018).

Theoretical and Developmental Frameworks

Theories are essential for researchers to describe behaviors and the adoption of behaviors learned through interventions. They can help explain the success of a program or intervention. However, one theory is not sufficient to explain complex behaviors. Therefore, a comprehensive integration of several relevant theories is essential to predicting the mechanisms of behaviors.

Ecological Systems Theory

The Ecological Systems Theory was developed by Urie Bronfenbrenner to explain how the environment affects human development (1974, 1994). This theory asserts that to understand human development, the entire ecological system in which an individual lives must be considered. Bronfenbrenner divided a person's environment into five different systems: the microsystem or immediate environmental setting (e.g., family, school, peers), mesosystem or interlinked system of microsystems (e.g., the relationship between a child's parent and schoolteacher), the exosystem or external, environmental elements (e.g., mass media, government agencies, school board), macrosystem or ideologies of culture surrounding the individual (e.g., system of laws, geographic location), and the chronosystem or the environmental changes that occur over time (e.g., major life transition such as a parental divorce). As a person grows and develops, the interactions between these systems become more complex and intertwined. Additionally, the influence of one system is dependent on its relationships with the other systems.

This theory suggests that factors from multiple systems influence behaviors, so it is imperative that targeted interventions address influencing factors at multiple levels (Golden et al., 2015; Sallis & Owen, 2015). Youth who are underserved experience stressors and lack of resources in multiple microsystem domains (families, schools, and communities), and face discrimination due to systemic biases and societal beliefs in the mesosystem and macrosystem (Blanchard et al., 2021). Due to these challenges, these youth are more likely to experience externalizing and internalizing problems, as well as poorer academic outcomes and negative social outcomes compared to their advantaged peers (Grant et al., 2006; Keenan et al., 1997).

Mindfulness can be integrated into an individual's ecological system on multiple levels. Mindfulness targets the interpersonal level through the development of the knowledge, attitudes, and skills needed to develop self-awareness and self-management, as well as the intrapersonal level and social level through the development of social awareness and relationship skills. In addition, through the implementation of mindfulness-based programming and interventions in schools, mindfulness may impact individuals on the organizational level.

Health Belief Model

The Health Belief Model (HBM) was created based on the theory of Kurt Lewin and colleagues that behavior depends on two specific variables: 1) the value placed by an individual on an outcome (value) and 2) the individual's estimate of the likelihood that a given action will result in that outcome (expectancy) (Lewin, 2013; Lewin et al., 1944).

However, individual course of action depends greatly on perceptions of the benefits and barriers associated with health behaviors, which the HMB categorizes into six constructs. First, perceived susceptibility is the subjective belief about the likelihood of acquiring a disease or reaching a harmful state because of partaking in a particular behavior. Health educators may use perceived susceptibility to help individuals understand the negative consequences and personalize those risks for participants. Second, perceived severity is a person's subjective belief in the extent of harm that can result from the disease or harmful state because of a particular behavior. Perceived susceptibility and severity grouped together are often referred to as perceived threat. Third, perceived benefits are a person's belief in the advantages of the methods suggested for reducing the seriousness or risk of the disease or harmful state. Fourth, perceived

barriers are beliefs concerning the actual and imagined costs of following a new behavior. For example, an individual may perceive an action to be effective; however, they may also perceive the action to be unpleasant, expensive, upsetting, or inconvenient (Rosenstock, 1974a; Skinner et al., 2015). Health educators must use their expertise to increase perceived threat of potential health outcomes while increasing perceived benefit of recommended health behaviors and reducing perceived barriers so that individuals take the recommended actions.

The final two constructs of the HBM were added to address additional factors that are key in determining whether an individual adopts a certain health behavior. Cues to action are the stimuli that trigger the decision to act. These cues can be internal (e.g., symptoms or emotions) or external (e.g., pressures or reminders from others). Finally, self-efficacy involves a person's confidence in their own ability to successfully perform or carry out a behavior as people do not often adopt behaviors they do not believe they are capable of performing.

The HBM can be applied to the adoption of health behaviors learned through MBSR. Previous research using the HBM to explain mental health utilization among adolescents showed that perceived susceptibility to mental health problems reduced the likelihood of health seeking behavior when teens did not perceive the benefits of and perceived many barriers to mental health help-seeking behavior (O'Connor et al., 2014).

Social Cognitive Theory

The Social Cognitive Theory (SCT; formerly The Social Learning Theory) posits that the following factors are important in the process of learning and maintaining a behavior: an individual's expectancies about the environment, consequences of their own

actions, self-competence to perform the behavior, incentive value (reinforcement) of the outcome of the behavior, and self-control to resist deviation from the behavior (Bandura & Walters, 1963). The theory later emphasized the agentic perspective or the active role that a person has in shaping and making decisions about their own life (Bandura, 2001). For example, in the adult mental health literature, believing that one can change through therapy or can find symptom relief is a predictor of whether that individual will seek and remain in therapy (Alfonsson et al., 2016). In the same way, participant outcomes following health behavior programs may be dependent on the belief that the program will be beneficial to the participant.

SCT and HBM contain similar concepts. For example, the SCT involves an individual's expectations about the environment and environmental cues, similar to HBM's perceived susceptibility to and severity of illness or adverse condition. The SCT also includes an individual's expectations about the consequences of a behavior, similar to HBM's perceived benefits of taking a particular action. Finally, the SCT describes the incentive value or the reinforcement of the outcome of the behavior, while the HBM describes the health motive or the value of reduction of perceived threats through partaking in the health behavior (Rosenstock et al., 1988).

According to the SCT, for people to perform a certain behavior, they must believe that the behavior will benefit them in a positive or desirable way and that they are also capable of performing that behavior. For example, to maintain a mindfulness practice, individuals must believe that mindful practice will benefit them in a positive or desirable way and that they are capable of performing that behavior. Thus, the SCT suggests that

interventions, such as those centered around mindfulness, must be tailored to meet the specific needs and desires of the target population.

The MindUP Mindfulness-Based Stress Reduction Curriculum for Adolescents

MindUp is a program based on social-emotional learning (SEL) that teaches skills and knowledge to regulate stress and emotions, form positive relationships, and act with kindness and compassion (Maloney et al., 2016). This curriculum combines neuroscience, mindfulness-based stress reduction, positive psychology, and SEL. MindUP is a Collaborative for Academic, Social, and Emotional Learning (CASEL) SELect program, meaning the program is evidence-based and meets the criteria for developing students' social and emotional competence at the highest level. MindUP addresses all five components of the CASEL SEL Framework: self-awareness, social awareness, self-management, responsible decision-making, and relationship skills (CASEL, 2020). Students are taught how the workings of the brain are related to emotions, behaviors, decision making, and learning. They are taught to respond to the world reflectively instead of reactively. The program was developed based on the Theory of Change stating that intervention activities affect proximal processes which impact psychosocial outcomes. MindUP is the first program to provide clear instruction in both SEL and mindfulness.

Intervention activities include mindful breathing, sustained attention on present moment experiences, practicing perspective-taking, optimism, gratitude, and savoring happy experiences, collectively engaging in acts of kindness to classmates and others in the community, and having shared experiences with classmates and teachers. The proximal processes that these intervention activities are intended to target include

improved mindful awareness of the body and mind, thoughts, emotions, behaviors, sensations, improved self-regulation skills, including attention regulation and inhibitory control, as well as improved empathy and perspective-taking. The desired outcomes of the program include improved prosocial behavior, increased well-being, improved stress physiology, and improved school success.

The MindUP program is separated into four units and 17 lessons. The first unit, "My Mindful Brain", introduces students to the MindUP program, the role of the brain in feelings and emotions, and the concept of mindfulness. This unit also introduces the Brain Break, consisting of core mindful listening and breathing exercise that will be revisited throughout the program. The second unit, "Mindful Senses", teaches students to experience the senses mindfully. This includes mindful listening, seeing, smelling, tasting, touch, and movement. The third unit is called "Building Well-Being with a Mindful Mindset". In this unit, students practice acknowledging and naming their feelings and emotions, perspective-taking and empathy, optimism, and savoring happy experiences. The final unit, "Mindful of Ourselves in the World", takes students' newfound mindful practice into the world around them through the practice of gratitude, acts of kindness, and a community-based project through mindful action.

A previous study randomizing fourth and fifth-grade students into the MindUP program or a social responsibility program over the course of 12 weeks demonstrated that students participating in the MindUP 45-minute weekly lessons demonstrated greater levels of self-reported empathy, perspective taking, and optimism compared to those that received the social responsibility program (Schonert-Reichl et al., 2015). In addition, students rated their peers in the MindUP program as more prosocial, trustworthy, and

helpful compared to peers in the control group, in addition to being more liked and rated as less aggressive. In a Canadian study involving students in 4th through 7th grade, most students indicated that they enjoyed taking part in the MindUP program (88%), learned something new (96%), learned things that were valuable for school and home life (95%), and would recommend the program to a friend (69%) (Maloney, 2015).

In another study, MindUP was implemented with students identified by their classroom teachers as in need of behavior improvements. In this study, improvements in passive on-task behaviors including attention regulation and inhibitory control were observed at the completion of the program. Additionally, students exhibited a decrease in non-disruptive off-task behaviors (Hai et al., 2021).

One study assessing teacher-rated school behaviors following the implementation of the MindUP curriculum showed significant improvements on four behaviors including aggression, social competence, attentional control, and behavioral dysregulation in 4th to 7th grade classrooms selected to receive the program compared to classrooms that did not receive the program (Schonert-Reichl & Lawlor, 2010). Finally, one study including teacher reports and attitudes noted the expansion of student socio-emotional skills as a result of the program, as well as increased confidence of the teachers to meet student needs (Kim et al., 2021). However, students participating in these studies were predominantly White. Although a few studies used this curriculum with students who are underserved and those predominantly identifying as racial and/or ethnic minorities, the students included in these studies were of Pre-Kindergarten age (Thierry et al., 2016; Thierry et al., 2018). Thus, no studies have evaluated the effectiveness of the MindUP program among adolescents who are underserved.

Current Study

As described earlier, access to mental healthcare is limited, especially in the Deep South (Fritze & Nguyen, 2021). Access is further limited for adolescents, who require specialized care as the teen years are a transitional period characterized by rapid brain maturation and social-emotional challenges (Abramson, 2022). Providing low-cost, effective mental health programming in schools is a viable strategy for mitigating the mental healthcare shortage and the growing mental health crisis among adolescents. School-based MBIs such as the MindUP program may provide accessible, feasible mental healthcare for youth who are underserved, but school-based MBIs have been rarely implemented with this population of youth. Thus, the overall objective of the present study is to understand the prospective effects of participation in the MindUP program as well as the perceived credibility of a school-based mindfulness intervention on mental health outcomes among adolescents who are underserved as well as evaluate the acceptability of the MindUP program.

Specific Aims

<u>Specific Aim 1</u>: Examine the role of participation in an in-school mindfulness-based intervention on mental health outcomes (depressive symptomology, anxiety symptomology, and perceived stress) during the intervention through post-intervention in comparison to the control group.

Hypotheses: Youth participating in the intervention will report an overall decrease in depressive and anxiety symptomology, as well as perceived stress, whereas the control group will show no change in depressive and anxiety symptomology and in perceived stress.

<u>Specific Aim 2</u>: Examine the role of perceived program credibility and program adherence on mental health outcomes (depressive symptomology, anxiety symptomology, and perceived stress) during the intervention through post-intervention.

Hypotheses: Among teens in the intervention group, those reporting higher perceived program credibility will report a faster decrease in depressive and anxiety symptomology, as well as perceived stress.

<u>Exploratory Aim 3</u>: Evaluate acceptability of a school mindfulness-based intervention for students who are underserved.

METHOD

Overview of the Parent Study

The present study is a part of a larger pilot study investigating the feasibility of in-school mindfulness interventions among adolescents titled: “Culturally Responsive Mindfulness-Based Instruction for a Birmingham Classroom”. The larger study aims to adapt and tailor an MBI to serve youth who are historically underserved through high fidelity, feasibility, acceptability, and tolerability. The curriculum for the school was selected based on pre-program focus groups conducted with school administrators, teachers/instructors, and students. The focus groups addressed needs, opinions, time constraints, and school-specific considerations. Based on information collected in the pre-program focus groups, the MindUP for Life curriculum was chosen (Maloney et al., 2016; example lesson plan in Appendix A). The study was approved by the Institutional Review Board (IRB) of the University of Alabama at Birmingham (UAB). The school began the twelve-week mindfulness program in September 2022 and was completed in December 2022.

Design

Fifth graders at a charter school in the city of Birmingham, Alabama were recruited to participate in the study. Students were randomized into the intervention and control groups using A/B or simple randomization. Half of the students participating in the study were randomized into the intervention group (the MindUP program). The other half were randomized into a control group (typical “Wellness” lessons). Students

completed a baseline survey (prior to start of the program), two mid-program surveys throughout the duration of the program, and a post-program survey following the completion of the program. In January 2023, students who participated in the MindUP program had the opportunity to participate in post-program focus groups to provide feedback to further tailor the program to the specific needs of the school and student population.

School Setting

The school that participated in the present study is a charter school opened within the last five years located in a large city in the southeastern United States. The elementary school included Kindergarten through 5th grade. The average fifth-grade class size for the 2022-2023 school year within the elementary school was 25 students per classroom and the student-to-teacher ratio was 19:1. Each classroom had one primary teacher and one paraeducator that was shared among the classes within each grade. The school has one counselor for the elementary level, one social worker for the system, and one behaviorist for the system.

At the time of the present study, the school used the Positive Behavior Interventions and Supports (PBIS) tier system to address student behavior problems. This system incorporates social-emotional learning as a tool to improve behavior through setting clear behavioral expectations of students, monitoring the progress of student behavior, and rewarding positive behaviors. There are three "tiers" in the PBIS approach. Tier 1 is a universal strategy that addresses 100% of the student body and behavioral expectations for all students. Tier 2 is utilized for students with behavioral concerns that persist after redirection. These students are provided intervention within a small group or

with an individualized plan that addresses specific behaviors. Tier 3 includes intense support for a small number of students with behavioral concerns that are typically due to personal, health, social, and/or family concerns outside of school. Tier 3 includes wraparound services in addition to an intervention plan, including mental health support (Richardson et al., 2018).

During the 2022-2023 school year, the percentage of students within the school eligible for free or reduced-price lunches was 88%. Students attending the school with IEPs made up 15% of the total school population. Less than 1% of students had 504 plans.

Participants

Participants (N=48) were recruited through the school participating in the study. There were three fifth grade classrooms and 64% of students within those classes consented to participate in the study. All students participating in the study are enrolled in the fifth grade (M_{age} = 10.5). Twenty-four students were randomized into the experimental group and 24 students were randomized into the control group. In the total sample, 46% of students identified as female, 29% identified as male, and 2% identified as non-binary. Seventy-nine percent of students identified as Black/African American, 15% identified as White, 2% identified as American Indian or Alaskan Native, and 2% identified as more than one race. Two percent of students identified as Hispanic/Latino. See Table 1 for full demographics.

The teacher implementing the program identified as White and female. She has over 10 years of teaching experience in an elementary school setting.

Procedure

Recruitment within the school included distributing fliers to parents and students. To be eligible, participants had to be enrolled in the school participating in the study, be a student in the grade level selected for the study and have obtained written parental consent. Research assistants determined eligibility and provided information to parents and students through telephone screenings that provided a full overview of the study, gathered demographic information, and offered the opportunity for parents and students to ask questions related to the study. Informed consent and assent were obtained in accordance with the UAB IRB protocol. Participants were paid based on partial or full completion of the study.

MindUP class sessions were held twice a week for 30 minutes during the school "Wellness" block between 11:30am and 12:30pm. A designated teacher at the school was responsible for leading program sessions with the students. A researcher was present at all program sessions to conduct fidelity checks, observe sessions, and assist the teacher when needed.

Surveys were collected electronically through Qualtrics and completed at the school. Surveys were administered at baseline, at two timepoints during the program, and following the completion of the program. All personal identifiers were removed. Following the completion of the program, post-program focus groups were conducted to obtain feedback on the acceptability of the program. This included gathering feedback from students including suggestions/considerations for continuing the program in the future.

Teacher MBSR Training

The teacher in charge of leading the MindUP program at the school as well as the researcher present at all MindUP sessions completed an abbreviated MBSR training program tailored to the needs of school teachers leading MBSR curricula for students. The program lasted for six weeks at one and a half hours per session. All sessions were completed virtually via Zoom. The program covered all tenets of MBSR.

Additionally, the researcher was present at all MindUP sessions and responsible for all fidelity checks completed an eight-week MBSR training course provided through the University of Minnesota Bakken Center for Spirituality & Healing. The course was taught by a certified instructor in MBSR. The course was an 8-week in-depth training consisting of a one-hour orientation, eight two-and-a-half-hour class sessions, and one all day retreat. The course was completed virtually via Zoom.

Measures

Demographics. Students reported on their age, gender identity, racial identity, ethnic identity, and zip code of current residence. Demographics were obtained at baseline.

Short Mood and Feelings Questionnaire – Child (SMFQ-C). The SMFQ-C measures symptoms of depression among children aged 7-18 years using 13 items (Angold et al., 1995). Students are asked to indicate how much they have felt or acted in the past two weeks (e.g., “I felt miserable or unhappy.”). Items are rated on a three-point scale from “0” (Not True) to “2” (True). This measure has been validated among children and adolescents in clinical and non-clinical settings (Kent et al., 2006; Messer, 1995).

The SMFQ-C was administered at all timepoints. A total summed score was computed at each time point. Cronbach's alpha ranged from .87-.93.

Screen for Child Anxiety Related Emotional Disorders (SCARED) Brief Assessment of Anxiety. The SCARED measures anxiety symptoms among children aged 7-17 using five items (Spitzer et al., 2006). This measure asks students to indicate the answer that seems to describe them now or in that particular moment (e.g., "I get frightened for no reason at all."). Five items are rated on a three-point scale from "0" (Not True or Hardly Ever True) to "2" (Very True or Often True). The SCARED is a valid and reliable measure of anxiety symptoms (Birmaher et al., 1999). The SCARED was administered at all timepoints. A total summed score was computed at each time point. Cronbach's alpha was .65 - .78.

Perceived Stress Scale – Child (PSS-C). The PSS-C measures perceived stress developed for children aged 5 to 18 (White, 2014). Students are asked questions about their feelings and thoughts during the previous week (e.g., "In the last week, how often did you feel rushed or hurried?"). Thirteen items are rated on a four-point scale from "0" (Never) to "3" (Very Often). The PSS-C has been validated for children and adolescents (White, 2014). PSS-C scores are obtained by reversing seven positively stated items and summing across all scale items. The PSS-C was administered at all timepoints. A total summed score was computed at each time point. Cronbach's alpha ranged from .69 - .77.

Perceived Program Credibility. Perceived program credibility is measured using an adapted version of the Credibility/Expectancy Questionnaire (Devilly & Borkovec, 2000). Students are asked to indicate how often they are practicing mindfulness (e.g., "How often are you practicing mindfulness?"), their perception of the mindfulness

program (e.g., “At this point, how pleasant or unpleasant does this mindfulness program seem?”), and how much improvement they believe they will gain from participation in the program (e.g., “By the end of the mindfulness program, how much improvement in your attention do you think will occur?”). Nine items are measured on a 9-point scale from “1” (Not at all) to “9” (“Very Much”). Perceived program credibility was measured at all timepoints. A total summed score was computed at each time point. Cronbach’s alpha ranged from .78 - .90.

Fidelity. Fidelity of the program was assessed using weekly fidelity checklists completed by the researcher present at mindfulness class sessions. The weekly fidelity checklists included the following items: the setting is conducive to the class (e.g., set up of room neat and simple); materials were prepared prior to the session; lessons are taught in the correct order; all activities are presented in accordance with instructions teacher demonstrates understanding of lesson themes; and concepts, ideas, and themes of personal interest are not presented (but personal examples that are relevant to the topic may be used). In addition, an observation checklist is provided to ensure teachers prepared students for the core practice, lead the core practice effectively, reflected with the students, engaged effectively with students, and that all teachers in the classroom participated in the practice (see Table 15). The researcher and teacher conducting the sessions meet weekly to discuss fidelity. The researcher provided the teacher with feedback on each lesson and discussed improvements needed to maintain fidelity.

Post- Program Focus Group Discussions. Focus group discussions with students were conducted at the conclusion of the program. These focus groups occurred in January 2023. Discussions covered student opinions of the program, suggestions for

improving the program, and adaptations that can be made to fit the needs of the school and students for the future. Groups were moderated by an outside researcher who did not assist in the administration of the program and was trained in conducting focus group discussions. A tailored script including primary discussion questions and probes was used to guide each discussion (see Appendix 2).

Data Analyses

Preliminary Analyses

Analyses were conducted in SPSS Version 28, SAS Software Version 9.4, and Mplus Version 8.9. Descriptive statistics were used to characterize the sample using frequencies for categorical variables and means and standard deviations (SD) for continuous variables. All continuous variables were inspected for outliers, defined as values that lie three or more standard deviations above or below the mean. The truncated outlier filtering method or replacing the minimum and maximum with the closest value within the sample was used to account for outliers.

The amount of missing data was examined at each time point. Individuals with missing data were compared to those who complete data on demographic and baseline variables using t-tests. Differences between the intervention and control group on baseline variables were tested using t-tests and chi-squared tests. Bivariate associations among all study variables were tested. Pearson's correlations tested the relationship between outcome variables (mental health outcomes).

Primary Analyses

Specific Aim 1: Examine the role of participation in an in-school mindfulness-based intervention on mental health outcomes (depressive symptomology, anxiety symptomology, and perceived stress) during the intervention through post-intervention in comparison to the control group.

Multilevel modeling was used to conduct the main analyses. First, Unconditional Means Models were conducted to partition the total variance in each mental health outcome into within-person and between-person variance. Next, Unconditional Growth Models were conducted to determine how much of the within-subject variability is explained by the effect of time over the course of the mindfulness program. Time was scaled by survey distribution timepoint (TP0 to TP3). In the final models, the experimental condition (intervention vs. control) and condition by time interaction were added to the previous model to predict each of the mental health outcomes. Variance components were obtained to measure within-person and between-person variance. In addition, goodness-of-fit was evaluated by examining the reduction in the Akaike information criterion, Schwartz Bayesian information criterion, and a likelihood ratio test for nested models. The main analyses allowed for the analysis of all available data, thus eliminating complete-case bias resulting from listwise deletion (Ibrahim & Molenberghs, 2009).

Assumptions testing was conducted for the full, final models. Error distributions were examined for normality and independence. Output residuals were inspected for normality (epsilon at Level 1). Probability plots were inspected for normality and standardized residuals were visually inspected for extreme cases or outliers. Tests of

normality were also conducted (Wilks-Shapiro and Kolmogorov-Smirnov). Raw Level 1 residuals were plotted against time to check for homoscedasticity.

ANCOVAs were added to the analyses as posthoc examinations of the effect sizes of each outcome (depressive symptomology, anxiety symptomology, and perceived stress) at each timepoint except baseline. The baseline measurement of each outcome variable was used as a covariate in the analyses.

Specific Aim 2: Examine the role of perceived program credibility on mental health outcomes (depressive symptomology, anxiety symptomology, and perceived stress) during the intervention through post-intervention.

These models were estimated using data from the students in the intervention (MindUP) group only. Summed perceived program credibility was added to the final Aim 1 models to predict each of the mental health outcomes (depressive symptomology, anxiety symptomology, and perceived stress).

Additionally, three autoregressive cross-lagged models were used as posthoc analyses to assess the directional and reciprocal relationships between perceived program credibility and each outcome (depressive symptomology, anxiety symptomology, and perceived stress) at each timepoint. The autoregressive effects measure how fluctuations in a specific outcome can be explained by the level of that outcome from the previous timepoint. The reciprocal cross-lagged effects measure how the predictor at the previous timepoint impacts the outcome at the following timepoint and vice versa. Correlations between the predictor and outcome within each timepoint are also measured in these models.

Exploratory Aim 3: Evaluate acceptability of a school mindfulness-based intervention for students who are underserved.

Focus group sessions were recorded and transcribed verbatim. Two research team members read the transcript and developed a codebook to facilitate the analysis. Qualitative data were coded and analyzed using a framework approach also drawing on grounded theory methods. Broadly pre-defined codes were developed based on the interview topics and questions as well as themes that emerge from the transcripts. Codes were specifically defined, and the framework was agreed upon by research team members before coding the transcripts. Coded data were then reviewed by the research team and fine codes were identified to further define the data. A detailed summary of identified themes, findings, and illustrative quotes were produced. The full focus group guide can be found in Appendix B.

RESULTS

Preliminary Results

The analyses included data from 48 fifth graders having an average age of 10.2 (SD = 0.2) at baseline. Half of the participants (n = 24) were randomized into the MindUP group and half were randomized into control group (n = 24). Twenty-four students identified as female (12 in MindUP, 12 in control), twenty-three identified as male (11 in MindUP, 12 in control), and one identified as non-binary (in the MindUP group). In the total sample, 39 students identified as Black/African American (19 in the MindUP group, 20 in the control). Students in the MindUP group attended an average of 16 out of the 20 class sessions (with one student only attending one class session and one student attending all 20 sessions). Table 1 provides descriptive statistics of participant characteristics.

A positive correlation between anxiety symptomology and depression symptomology was found for both the MindUP and control groups (all *ps* < .001). Correlations between outcomes variables can be found in Tables 2 (MindUP group) and 3 (control group; see Table 2). Independent samples t-tests indicated the two groups (MindUP and control) were not significantly different on any outcomes variables at any time point (all *p*s > .05).

Missing Data and Outliers

The final sample included 48 total participants with 47 participants providing data at TP0 or baseline (24 in MindUP group, 23 in control group), 46 at TP1 (23 in MindUP group, 23 in control group), 46 at TP2 (23 in MindUP group, 23 in control group), and 46 at TP3 (24 in MindUP group, 22 in control group). Missing data were due to two student suspensions from school, two student withdrawals from enrollment in school, and students refusing to complete study surveys in two instances. In two cases, students who were suspended at certain timepoints returned for later timepoints. One student was unable to participate at baseline but joined starting at the following timepoint.

One outlier was found for each of the following variables: program credibility at timepoint 3 total score, perceived stress at baseline total score, perceived stress at timepoint 2 total score, and perceived stress at timepoint 3 total score. Outliers were defined as values falling three SDs above or below the mean of a given variable. All outliers were truncated to the next closest value within three SDs from the mean.

Primary Results

Aim 1 Results

Unconditional means models yielded intraclass coefficients of 0.33 for total depressive symptomology, indicating that 33% of the variance in total depressive symptomology was due to differences among subjects versus within subjects over the course of the MindUP program. The between-subject and within-subject variances were significant ($p < .001$), indicating differences among and within individuals. An unconditional growth model indicated a non-significant change in total depressive symptomology over the course of the MindUP program (Table 4). Participants reported an average of 7.54 points on depressive symptomology at the initial timepoint (TP1),

however, no change in total depressive symptomology over time were detected ($p > .05$). Higher depressive symptomology at baseline (TP0) was associated with higher depressive symptomology at the following timepoint (TP1). Intervention Group was not associated with a significant difference in depressive symptomology at the initial timepoint (TP1; $p > .05$; see Figure 4). Additionally, Intervention Group was not associated with change in depressive symptomology over time ($p > .05$).

Unconditional means models yielded intraclass coefficients of 0.53 for total anxiety symptomology, indicating that 53% of the variance in total anxiety symptomology was due to differences among subjects versus within subjects over the course of the MindUP program. The between-subject and within-subject variances were significant ($p < .001$). An unconditional growth model indicated a non-significant change in total anxiety symptomology over the course of the MindUP program (Table 6). Participants reported an average of 2.93 points on anxiety symptomology at the initial timepoint (TP1), however, no change in total anxiety symptomology over time were detected ($p > .05$). Higher anxiety symptomology at baseline (TP0) was associated with higher anxiety symptomology at the following timepoint (TP1). Intervention Group was not associated with a significant difference in anxiety symptomology at the initial timepoint (TP1; $p > .05$; see Figure 5). Additionally, Intervention Group was not associated with change in anxiety symptomology over time ($p > .05$).

Unconditional means models yielded intraclass coefficients of 0.59 for total perceived stress, indicating that 59% of the variance in total perceived stress was due to differences among subjects versus within subjects over the course of the MindUP program. The between-subject and within-subject variances were significant ($p < .001$).

An unconditional growth model indicated a non-significant change in total perceived stress over the course of the MindUP program (see Table 8). Participants reported an average of 21.83 points on (outcome) at the initial timepoint (TP1), however, no change in total perceived stress over time were detected ($p > .05$). Higher perceived stress at baseline (TP0) was associated with higher perceived stress at the following timepoint (TP1), but only with the addition of Intervention Group into the model. Intervention Group was not associated with a significant difference in perceived stress at the initial timepoint ($p > .05$; see Figure 6). Additionally, Intervention Group was not associated with change in perceived stress over time ($p > .05$).

Assumption Testing. All outcome and predictor variables were within the acceptable ranges for skewness and kurtosis. Shapiro-Wilk and Kolmogorov-Smirnov tests were non-significant, indicating normality. Durbin-Watson tests indicated no extreme autocorrelations. White's tests indicated no violations of homoscedasticity. Error distributions indicated normality and independence. Output residuals at Level 1 were normally distributed. Probability plots indicated normality and raw Level 1 residuals plotted against time indicated no violations of homoscedasticity.

Posthoc Analyses. Following the non-significant results from the multi-level models for depressive symptomology, anxiety symptomology, and perceived stress, ANCOVAs were run to examine effect sizes at each individual timepoint except baseline. Differences between MindUP and control group were non-significant for all outcomes (all *p*s > .05; see Tables 5, 7, & 9). Partial eta-squared calculations revealed small effect sizes for depressive symptomology (η^2 = .00-.01; see Table 5), anxiety symptomology (η^2 = .01-.02; see Table 7), and perceived stress (η^2 = .00-.03; see Table 9) at each timepoint.

Posthoc power analyses were conducted to determine the ability of the present study with a sample size of 48, two groups, and one covariate to detect small, medium, and large effect sizes. These analyses were conducted in G*Power Version 3.1 for the ANCOVAs. Results revealed that power was close to adequate (power = 0.77) to detect large effect sizes (f = 0.4). Power was not adequate (power = 0.40) to detect medium (f = 0.25) and not adequate (power = 0.10) to detect small (f = 0.10) effect sizes. To detect medium effect sizes, a sample size of 128 would have been required.

Aim 2 Results

Unconditional means models yielded intraclass coefficients of 0.32 for perceived program credibility, indicating that 32% of the variance in total perceived program credibility was due to differences among subjects versus within subjects over the course of the MindUP program (MindUP group only). An unconditional growth model measuring change in perceived program credibility over time indicated a significant increase in perceived program credibility from the first timepoint to the final timepoint ($p < .001$; see Table 13). The between-subject and within-subject variances were significant ($p < .01$), indicating unexplained variability.

Total perceived program credibility was not associated with depressive symptomology at the initial timepoint (TP1; $p > .05$). Additionally, total perceived credibility was not associated with a change in depressive symptomology over time ($p > .05$; see Table 10).

Total perceived program credibility was not associated with anxiety symptomology at the initial timepoint (TP1; $p > .05$). Additionally, total perceived

credibility was not associated with a change in anxiety symptomology over time ($p > .05$; see Table 11).

Total perceived program credibility was not associated with perceived stress at the initial timepoint (TP1; $p > .05$). Additionally, total perceived credibility was not associated with a change in perceived stress over time ($p > .05$; see Table 12).

Assumption Testing. All outcome and predictor variables were within the acceptable ranges for skewness and kurtosis. Shapiro-Wilk and Kolmogorov-Smirnov tests were non-significant, indicating normality. Durbin-Watson tests indicated no extreme autocorrelations. White's tests indicated no violations of homoscedasticity. Error distributions indicated normality and independence. Output residuals at Level 1 were normally distributed. Probability plots indicated normality and raw Level 1 residuals plotted against time indicated no violations of homoscedasticity.

Posthoc Analyses. Results from the first autoregressive cross-lagged model with perceived program credibility and depressive symptoms are shown in Figure 1. The results indicate a negative relationship between depressive symptoms and perceived program credibility at TP0 ($p < .05$), however, there were no associations between depressive symptoms and perceived program credibility within TP1, TP2, and TP3 (all *ps* $> .05$). Perceived program credibility was stable from TP0 to TP2 (*p*s $< .001$), however, perceived program credibility at TP2 did not predict perceived program credibility at TP3 ($p > .05$). Depressive symptoms were stable from TP0 to TP3 (*p*s $< .001$). Higher depressive symptoms at TP0 (baseline) predicted decreased perceived program credibility at TP1 (the initial timepoint in previous multi-level models) ($p < .05$). Depressive symptoms at TP1 did not predict perceived program credibility at TP2 ($p > .05$).

However, higher depressive symptoms at TP2 predicted decreased perceived program credibility at TP3 ($p < .01$). Perceived program credibility did not predict depressive symptoms at each subsequent timepoint (all $ps > .05$)

Results from the second autoregressive cross-lagged model with perceived program credibility and anxiety symptoms are shown in Figure 2. There were no relationships between perceived program credibility and anxiety symptoms at TP0, TP1, or TP2 (all $ps > .05$), however, there was a relationship between perceived program credibility and anxiety symptoms at TP3 ($p < .001$). As is in the previous model, perceived program credibility was stable from TP0 to TP2 ($ps < .001$), however, perceived program credibility at TP2 did not predict perceived program credibility at TP3 ($p > .05$). Anxiety symptoms at TP0 did not predict anxiety symptoms at TP1, however, anxiety symptoms were stable from TP1 to TP3 (all $ps < .05$). There were no cross-lagged effects of perceived program credibility and anxiety symptoms at any timepoint (all $ps > .05$).

Results from the third autoregressive cross-lagged model with perceived program credibility and perceived stress are shown in Figure 3. The results indicate a positive relationship between perceived program credibility and perceived stress at TP0 ($p < .05$), but no relationships within TP1, TP2, or TP3 (all $ps > .05$). As is in the previous model, perceived program credibility was stable from TP0 to TP2 ($ps < .001$), however, perceived program credibility at TP2 did not predict perceived program credibility at TP3 ($p > .05$). Perceived stress at TP0 did not predict perceived stress at TP1, however, perceived stress was stable from TP1 to TP3 (all $ps < .001$). Perceived program credibility at TP0 did not predict perceived stress at TP1 ($p > .05$), however, perceived

program credibility TP1 did predict perceived stress at TP2 ($p < .05$). Perceived program credibility at TP2 did not predict perceived stress at TP3 ($p > .05$). Perceived stress did not predict perceived program credibility at any of the timepoints (all ps > .05).

Posthoc power analyses were conducted to determine the ability of the present study to detect small, medium, and large effect sizes. These analyses were conducted in G*Power Version 3.1 for the regression analyses. Results revealed that power was adequate (power = 0.80) to detect large effect sizes (β = 0.50). Power was not adequate (power = 0.32) to detect medium effect sizes (β = 0.30). A total sample size of 81 would have been required for adequate power to detect a medium effect size (β = 0.30).

Exploratory Aim 3 Results

All students randomized into the MindUP program participated in post-program focus group discussions (FGDs). Two student FGDs were conducted, split into the same class groups that completed the program together. Thirteen students participated in the first FGD and ten students participated in the second. The student FGDs lasted between 20 and 30 minutes. Themes and sub-themes were extracted from these discussions based on questions asked during FGDs. The key emergent themes from the FGDs included: 1) Takeaways from the MindUP program; 2) Liked about the program; 3) Disliked about the program; 4) Challenges during the program; 5) Usefulness of mindfulness practices for self and fifth-grade peers; 6) Reasons why students in the fifth-grade might use mindfulness skills; 7) Reasons why students in the fifth-grade might not use mindfulness skills; 8) Program implementation length; 9) Likelihood other fifth-graders would want to participate in the program; 10) Additional information desired from program; 11) Thoughts on mindfulness after completing the program; 12) Thoughts on program

instructors/facilitators; 13) Sharing skills learned in program with family; and 14) Using mindfulness techniques in the future.

Theme 1: Takeaways from the MindUP Program. Students were asked to reflect on their main takeaways or concepts/skills learned during their time in the MindUP program. The sub-themes identified can be organized into five categories: 1) Thinking before acting or reacting; 2) Taking a "brain break" or breathing to manage emotions; 3) Practicing empathy towards others; 4) Using mindful senses; and 5) Areas of the brain affected by mindfulness (neuroscience).

Thinking before acting or reacting

Students mentioned that the program helped them think before acting or reacting in certain situations. In many cases, this included thinking before saying something that might cause a conflict with a friend or peer as well as being mindful of the feelings of others. One student stated:

"We learned you should always… think about what you say before you actually say it."

Another student stated:

"Think before you do something."

Taking a "brain break" or breathing to manage emotions

Students learned breathing techniques or the "brain break" technique that they are able to use when they need to calm down or relieve stress:

"I learned that you should just breathe sometimes."

Practicing empathy towards others

Students reflected on how they can use the skills learned in the MindUP program to practice empathy in their interactions with others.

"We… learned to put yourself in other people's shoes."

"It is important to care about people and their feelings."

Using mindful senses

Students mentioned that one of the major takeaways from the program was the knowledge and skills to use each of the five senses (taste, smell, sight, hearing, and touch) mindfully. One student said:

"I learned you can do things mindfully… with any sense. Taste, smell, sight, hearing, anything."

The mindful sense mentioned most was mindful tasting, one student stated:

"Something that I learned… was that you can do mindful tasting."

However, other students suggested that some of the mindful sense exercises may not be useful in their mindfulness practice.

"Mindful smelling (did not seem useful)."

Parts of the brain affected by mindfulness (neuroscience)

Students mentioned that they learned about the parts of the brain that are activated when they are stressed, involved in problem solving, and long-term storage of knowledge/memories.

"I learned about the owl and your guard dog."

"…the frontal lobe. The elephant."

Theme 2: Liked about MindUP program. Students were asked to describe the parts of the MindUP program they liked and would want to see in the future. These included 1) Break from other classes; 2) Relaxation and deep breathing; 3) Hearing perspectives/feelings from classmates; and 4) Activities in the MindUP program.

Break from other classes

Many students liked that the program provided a break from other classes:

"I liked that it gave me a break from… the class and all that."

Relaxation and deep breathing

"I liked that it gave me peace of mind."

Hearing perspectives/feelings from classmates

Participating in the program gave students a unique opportunity to hear the perspectives and feelings of their peers:

"(Liked) the people… hearing their feelings."

"Seeing things from other people's perspective."

Activities in the MindUP program

Students cited that they enjoyed most of the activities in the program:

"(Liked) the tasks, the breathing, and the going outside."

These activities included a mindfulness journal that students had the opportunity to decorate at the beginning of the program and used to reflect on activities during most of the class sessions:

"I liked… when we got to draw and write in our journals and when we got to decorate them."

Theme 3: Disliked about the program. Students reflected on the part of the MindUP program that they disliked including: 1) the final activity (community project); 2) Missing other classes; and 3) Participating on bad/difficult days.

Final activity (community project)

Some students stated that they did not enjoy the final unit of the program that included a community project. One group created cards of encouragement for classmates while another group picked up trash around the school:

"…I disliked the ending part when we did that little reading things. It's just cringy."

Another student disliked this activity because they did not feel like students were incorporating mindfulness into the activity like they were instructed to do:

"…the ending part like she said. I did not like that at all because nobody was actually being mindful they were only doing it because they wanted to participate."

Missing other class activities

For the students participating in the MindUP program, their participation required missing their Wellness or Enrichment classes two times per week throughout the duration of the study. Some students indicated that they disliked missing fun activities in their other classes to participate in the program. One student stated:

"Something that I disliked was… sometimes we get to do fun stuff in our classes and I missed it…"

Having to participate on difficult/bad days

Some students found it difficult to engage with the class and mindfulness activities on difficult days in which they were experiencing difficult emotions or were tired. One student stated that even though they enjoyed the class most of the time, it was difficult to enjoy the class when they were having a difficult day:

"I went to every single class and I enjoyed it, and sometimes I didn't because it was a bad day and I just wanted to go home."

Another student said that some days they were tired during class and just wanted to sleep:

"-…sometimes I just wanted to go to sleep."

Theme 4: Challenges during the MindUP program. Students were asked to describe any challenges they faced while participating in the MindUP program. Challenges cited included 1) Expressing personal feelings and 2) Consistent practice of mindfulness.

Expressing personal feelings

The MindUP program includes activities that require students to think about their emotions and reflect on the impact of these emotions in their daily lives. Students stated that expressing personal feelings was difficult at times:

> "(What was) challenging about it was we had these little bullets (points) and we had to write our feelings down and draw out feelings and stuff."

> "Just telling really personal stuff."

Consistent practice of mindfulness

Students cited difficulty regularly practicing mindfulness because it is not something they are used to:

> "Something that was hard for me was being mindful because I'm not very mindful and I… struggled with getting back into the state of being mindful because I don't practice that much."

One student mentioned the challenge of being calm and maintaining mindfulness in your environment:

> "It's kind of challenging… being calm and mindful of your surroundings."

Theme 5: Usefulness of mindfulness practices for self and fifth-grade peers. Students were asked to explain how useful they felt the practices learned in the MindUP program are for themselves as well as imagine how useful these practices could be for their fifth-grade peers. Students focused mainly on how the practice is used to relax, manage anger, and handle difficult interactions with others.

Managing anger and reactions to certain situations (taking a brain break)

"…really helped me relax."

"It helped me because I would get really mad sometimes over little, small stuff."

"When people are saying something disrespectful, it taught me how to breathe."

Theme 6: Reasons why students in the fifth-grade might use mindfulness skills. Students also stated the reasons why students in the fifth-grade might use mindfulness skills and practices. They specifically stated that mindfulness would be used to control emotions and to be used at home with family.

To control emotions

Students in the MindUP program stated that their classmates might benefit from learning to control and/or process difficult emotions:

"…some of them have anger issues or have problems with showing their emotions."

"Because if you get angry at one point you can meditate or take ten deep breaths…"

It was also mentioned that mindfulness programming could help students with the emotions experienced during their everyday lives:

"…some people have really bad anger issues that they need to get resolved and some people need it because they have a lot going on in their everyday basic lives."

Helps with mindfulness at home and with family

Some students mentioned that they found time to practice mindfulness at home, which was encouraged throughout the program:

"…it helped me do mindful things at my house."

One student stated that they have started to incorporate mindfulness into their daily routine:

"I will usually wake up and do the same thing I did yesterday, but (now) I might do something else, talk to someone else."

Theme 7: Reasons why students in the fifth-grade might not use mindfulness skills. Students in the fifth-grade might use not the skills from mindfulness because they are experiencing difficult emotions or it deviates from their regular school schedule.

Experiencing difficult emotions

Students in the fifth-grade may not use mindfulness skills because they are overwhelmed by their emotions:

"They just full of anger."

They may also not use mindfulness depending on when the program is given during the day:

"Cause in the afternoon they get cranky."

Students may also not want to participate in mindfulness because it deviates from their regular school schedule:

"Because… (they) don't like things that are not out classes and they might not like they way everything works in there because they can't have it their way."

Mindfulness might also not be a subject that they care about:

"They might just not care."

Theme 8: Program Implementation Length. Students were asked about the program length including the number of days per week the class sessions were held and the length of the class sessions. Most students indicated that they would have liked for the MindUP program to have been longer.

"It should have been longer."

Some indicated that they would have liked to attend the class more frequently throughout the week instead of two days per week:

"Should have been all week."

"I think if it was like three times a week (that would be) fun too because class is crazy and it is a nice break but I hope that one time it can be longer semester instead of the normal time it stopped."

Theme 9: Likelihood other fifth-graders would want to participate in the program. Students outlined the reasons other students in their grade may or may not want to participate in the MindUP program in the future.

Extraneous reasons for participation

Some students stated that other fifth-graders may only want to participate if they were being paid to do so:

"Only if they knew about the money first then they would participate."

Reasons other fifth graders may not want to participate

Others mentioned that students might not want to participate if they are in the class with someone they do not like or get along with:

"Some people might not because go in there because there are some people they might not trust or like."

They also expressed concerns about the class becoming too crowded or chaotic if all fifth-graders were participating together:

"If everyone was available to be in the mindfulness program some people might not want to go because (it) might be too crowded…"

Theme 10: Additional Information Desired from Program. Students were asked to discuss any additional information they would have liked to receive during their time in the program, citing they would have like more practice controlling emotions and more techniques for handling difficult interactions.

Practice controlling emotions

Some students suggested that additional practice controlling emotions would have been beneficial to include in the program:

> "How to control my feelings even though I know I am about to say something that's about to hurt somebody else's feelings."

More techniques for handling difficult interactions

One student suggested more role-play scenarios to practice managing difficult interactions or emotional situations with others:

> "…Like in the future, you can get two people… And then one of them can get on the other person's nerves and makes you have to think before (they) said something."

Theme 11: Thoughts on mindfulness after completing the program. Students were asked to give their thoughts on mindfulness after completion of the program. Some stated their thoughts remained the same while others cited change in their perception of mindfulness due to participation in the program.

Remained unchanged

Some students indicated that their thoughts on mindfulness have not changed throughout the program:

> "Never changed."

Warmed up to mindfulness

Some students suggested that at the beginning of the program they did not know or care much about mindfulness, but after going through the program have a positive view of mindfulness:

> "I think it is very cool and I think it is a fun way to relax without having to solve it by yourself. And it's a fun way to calm yourself down because at first I didn't care about mindfulness."
>
> "At first, I didn't like it… but after getting used to it I liked it."

Theme 12: Thoughts on program instructors/facilitators. Students shared their thoughts on the program instructors/facilitators, stating they found them to be trustworthy and open to discuss anything.

Trustworthy

The students agreed that they felt comfortable sharing with the teachers/facilitators of the program. They felt that the teacher leading the program was trustworthy and kept any personal information shared with the group confidential:

> "Everything you say, she kept it in this program."
>
> "She kept it in the room."

Open to discuss anything

They also stated that teacher was open and welcomed students to share their thoughts and/or feelings without judgment:

"They were very open, and they would not say something is wrong… they were really open and let us talk about things that were troubling."

Theme 13: Sharing mindfulness skills learned in program with family.

Students were asked if they shared any of the skills learned in the program with family members. Some students shared how mindfulness helped them with anger, how the program helped them with their breathing, and some of the specific skills learned with members of their family.

Shared how mindfulness helped with anger

One student shared with family members how the program helped them manage their anger:

"About how it helped my with my anger."

Shared how mindfulness helped with breathing more

Another student shared with their mother how the program helped them take more time to breathe:

"I told my mom about how it helped my breathe more."

Demonstrated mindfulness methods to family

And another student showed their family member some of the mindfulness techniques skills learned in the program:

"I showed her some methods."

Theme 14: Using mindfulness techniques in the future. When asked when they would use mindfulness techniques in the future, students stated specifically they would use the techniques when they are frustrated with others.

Using mindfulness when frustrated by others

Mindfulness techniques would be used in the future when they are frustrated with others, namely their classmates and their siblings:

"When I am about to be driven insane by my class because they talk way way way too much."

"Some of my siblings just get on my nerves almost all of the time."

"My sibling…"

Integration of Qualitative and Quantitative Findings

Data from surveys and focus group discussions examined unique and complementary constructs. The quantitative multi-level models presented in Table 11 complement the qualitative thematic findings related to perceived program credibility, specifically when referring to initial thoughts or opinions about the program. Theme 11 focused on students' opinions and feelings about mindfulness after completing the

MindUP program. Qualitative and quantitative findings suggest that with increased exposure to the program, the belief that the program is beneficial or credible increases.

In Theme 4, students mentioned difficulty with sharing and expressing feelings as one of the challenges of participating in the program. Discussing emotions and an invitation to share feelings was a part of some of the activities in the program. However, FGDs did not explicitly inquire about mental health symptomologies as these are personal and potentially triggering. Students broadly mentioned the benefits of mindfulness for managing stress or anger and emotions related to mental health symptomologies. However, the quantitative analyses did not reflect a significant change in perceived stress or mental health symptomologies (depression and anxiety). Therefore, it is difficult to connect themes extracted from these discussions to the primary quantitative outcomes of the present study.

DISCUSSION

The current study utilized a multi-method approach to investigate the role of a 12-week in-school, mindfulness-based intervention on mental health outcomes among young adolescents who are underserved. These findings suggest no relationship exists between MindUP program participation and changes in depressive symptoms, anxiety symptoms, and perceived stress throughout the program. Perceived program credibility also did not predict changes in depressive symptoms, anxiety symptoms, and perceived stress for those participating in the MindUP program. Posthoc analyses revealed that the effects sizes for the models were consistently small. However, among students in the MindUP group, perceived program credibility did increase throughout the program. The final exploratory aim incorporated qualitative feedback from discussions with students who participated in the program. These discussions provided some evidence to support the quantitative findings, specifically findings related to perceived program credibility, which increased over time in the program. Additionally, these discussions provided feedback that may inform the continuation of the program at the school in the future, as well as rich qualitative data for researchers to better understand the perceived impact of the program in the participants' own words.

This study is among the first to examine mental health outcomes in a mindfulness-based program for youth who are underserved using a longitudinal design. Assessing changes throughout the program is crucial due to rapid developmental shifts during this period. Combining quantitative and qualitative methodologies strengthens the

evidence base and provides valuable insights for future research and program implementation. Additionally, the involvement of an experienced, licensed elementary school teacher trained in MBSR ensured high program fidelity and fostered trust with students. The teacher's personal mindfulness practice and understanding served as powerful models for the students, while also enhancing the potential for successful long-term implementation of the program for the future.

Though many studies examining mindfulness-based interventions have reported the positive impact of these programs across various domains, the findings from the current study align closely with findings from studies with students of similar ages and with similar outcome variables. Two consecutive Australian randomized controlled trials examining the impact of an in-school mindfulness intervention on depression and anxiety among younger adolescents also found no significant change from pre- to post-intervention, despite high reported program acceptability from students (Johnson et al., 2016; Johnson et al., 2017). As in the present study, these studies found small effect sizes (d = 0.002 - 0.28), even though both studies had adequate sample sizes (N = 308 & N = 555, respectively). The first of these studies included a mindfulness intervention group and a control group. The second included three groups: a mindfulness intervention group with students participating independently, a mindfulness intervention group with students participating with parent involvement, and a control group. The authors noted that one potential explanation for the lack of replication of previous studies conducted with older adolescents is that younger adolescents have neurocognitive differences due to their developmental phase and stage of brain maturation (Johnson et al., 2016).

In contrast, another study examining a mindfulness program among fifth-grade students did find a decrease in depressive symptoms from pre-program to post-program (N = 109, *d* = .27). In this study, students had optional daily mindfulness exercises in addition to their mindfulness classes within their primary classrooms, and there was no control group (Joyce et al., 2010). In another study conducted with sixth-grade students, mindfulness practice was added to an existing class (Asian history), and though there was an overall decrease in clinical syndrome scales (including anxiety), no group differences on these measures were found; however, those in the experimental (mindfulness) group only were less likely to develop suicidal ideation or self-harm when compared to controls. Additionally, the authors noted that based on their effect size interpretations, mindfulness training yielded a small to medium effect size benefit in affect over active controls (*d* = .41, N = 101). These findings suggest that the program's effects may be non-specific or unique to aspects of mental health (Britton et al., 2014). Though the reviewed studies had larger sample sizes, many still yielded small effect sizes coinciding with the findings of the current study.

A recent meta-analysis examining the effects of mindfulness-based interventions on adolescent depressive symptoms found that studies conducting follow-up measurements of depression show continued improvement past the conclusion of the intervention (Reangsing et al., 2021). In this same analysis, studies that combined mindfulness intervention with individualized therapy showed greater improvements in depressive symptomology than intervention alone. The authors suggested that mindfulness-based interventions be given in conjunction with individual therapy;

however, this is not readily available to many youth, especially those who are underserved (Hodginson et al., 2017).

Throughout the program, students in the MindUP group reported an increase in perceived program credibility. This finding was supported by themes derived from the student focus group discussions. Some students expressed their hesitancy or lack of interest towards the program at the beginning, but with more exposure to the class sessions, they began to develop an understanding of the importance of the program and grew in their liking of the program. This finding aligns with findings from another study implementing an in-school, mindfulness-based program among older adolescents who are underserved, in which perceived program credibility started low and increased throughout the program (Bluth et al., 2016). Qualitative acceptability measures revealed that these students wanted to participate in the class again in the future and perceived the mindfulness program as beneficial in reducing their stress levels.

Students in the present study indicated that sharing and discussing difficult feelings and emotions in class was challenging and sometimes uncomfortable. Students were reminded that all participation was optional, and every activity was prefaced with an invitation, not an order, to participate. It is plausible that students are more aware of their emotional states when practicing mindfulness, which may support the null findings regarding depressive symptomology, anxiety symptomology, and perceived stress (Booker et al., 2013). It is common for mindfulness practice, especially in the beginning stages, to elicit difficult emotions or remind an individual of past traumas (Kabat-Zinn & Hahn, 2009). However, throughout the program, many students indicated they felt more comfortable sharing as they became more accustomed to the class.

Additionally, the present sample included students scoring above and below clinically significant levels of perceived stress, depressive symptomology, and anxiety symptomology. Nine students in the MindUP group and five students in the control group were above the cutoff for the clinical average of perceived stress measured in previous work at baseline (White, 2014). Ten students in the MindUP group and eleven in the control group were above the clinical cutoff for depressive symptomology at baseline (Angold et al., 1995). Twelve students in the MindUP group and thirteen in the control group scored above the clinical cutoff for anxiety at baseline (Muris et al., 2000). Though some students were above the clinical cutoffs for the mental health outcomes, it is possible that the addition of non-clinically significant scores contributed to the null findings. Youth who showed only few mental health problems upon entering the program had less room for change over the course of the program in comparison to peers scoring in clinically meaningful ranges. Additionally, there may be an influence of floor and ceiling effects within the mental health measures, thus limiting the potential range of change for students.

The students in the present study felt comfortable with the program's teachers, perceiving them as trustworthy, open to discussion, and maintaining confidentiality within the MindUP class setting. The familiarity of having a teacher they already knew contributed to this trust. Building trust is crucial for program implementation and student engagement, especially for underserved youth. Previous research suggests that trust is established through appropriate responses, vulnerability, validation, and empowerment by adult leaders, developed over positive experiences and interactions (Griffith et al., 2018). In this study, the MindUP class was consistently led by a teacher from the school and co-

led by a researcher from outside of the school, allowing students to build trust. Consistency was emphasized by having the same instructors present for each class session.

Key informant interviews with the teacher who led the program and an administrator who served as a primary school contact for researchers were conducted and corroborated many themes extracted from the student focus group sessions. These interviews highlighted the program's benefits for students, enthusiasm about expanding the program to be given more frequently and made a part of regular school curricula.

This study was conducted in a charter school under pressure to meet state performance expectations to keep the school open (Alabama State Department of Education, 2021). Educators face challenges in adding an additional program to already busy schedules (Humphries et al., 2018). Full buy-in from teachers is crucial but difficult due to existing requirements. The enrichment or “pull out” suits the schools needs but may not be sustainable long-term, potentially creating a separation from students’ daily classroom routines.

Developmental Considerations

Little evidence supports the age at which mindfulness interventions make the most significant impact. Research examining other forms of SEL programming suggests that tailoring programs to specific developmental phases improve effectiveness (Yeager, 2017). Though early adolescence is a transitional developmental period, it is difficult to determine if this is the best time to implement mindfulness interventions. Older adolescents are typically more developed neurocognitively, whereas younger adolescents may reap the benefits of learning skills such as mindfulness practice earlier during this

time of rapid brain development, social-emotional development, and social transitions (Felver & Jennings, 2016; Johnson et al., 2017). Additionally, there is no model for how mindfulness can be interwoven into the early adolescent developmental stages (Johnson et al., 2017).

Recent critiques suggest a lack of developmental conceptualization within current mindfulness research; specifically, there is a lack of research measuring mindfulness across age groups and with varying methodologies (Goodman et al., 2017; Roeser et al., 2023). In particular, these studies emphasize the need to examine top-down (e.g., executive functions) and bottom-up (e.g., emotional processes) elements through which personal mindfulness practice may impact an individual or practice itself may be impacted. Other questions remain as to how mindfulness is conceptualized across development. At what point in development does mindfulness change? Is it gradual, or does it peak at a specific time and decline? How do other environmental or biological factors influence the development of mindfulness (Roeser, 2023)?

The administrator also emphasized the potential for mindfulness in helping students who exhibit behavioral dysregulation. This viewpoint is supported by research suggesting that the MindUP program can improve behavioral dysregulation in early adolescence (Schonert-Reichl & Lawlor, 2010). Students cited mindfulness practice as a strategy for managing their anger and a potential strategy for their classmates to manage anger. Management of anger under challenging situations, especially in interactions with peers, can translate to the reduction of outbursts and other behavioral problems in and out of the school setting (Bostic et al., 2021).

Adolescence is also a stage in which individuals' susceptibility to peer influence is heightened. Students mentioned the influence of peers in the focus groups, stating that complex dynamics between students could negatively influence the participation of those students if the program were available to all students. Additionally, this is a stage in which adolescents renegotiate relationships with authority figures and respond best to authority figures that seek to understand them in this unique phase by accepting push-back as a healthy part of development (Collins & Steinberg, 2006). Students described the lead teacher as being open and respectful of thoughts, ideas, and personal information shared in class. It is plausible that the teacher's approach to interactions with the students was imperative to student participation and overall positive reception of the program.

Adolescence is also a stress-sensitive phase, and though perceived stress did not significantly change throughout the program, students cited that they could see the potential for mindfulness to help themselves and other students their age deal with the stressors they experience in their day-to-day lives. Chronic stress is not easily remedied for students who have experienced ACEs; therefore, mindfulness may be one strategy in combination with additional strategies, including therapy, to create a long-lasting effect (Reangsing et al., 2021).

Theoretical Frameworks

Numerous factors influence the impact of mindfulness on adolescent mental health as described by the Ecological Systems Theory (Bronfenbrenner 1974; 1994). Qualitative discussions revealed mindfulness' influence on self-awareness, and relationship skills. The MindUP program was found to be beneficial for students in

dealing with interpersonal situations and conflicts. The administrator suggested that implementing programs such as MindUP can bring about school-wide changes.

Moreover, student acceptance of the program depends on their belief in the effectiveness of mindfulness in improving their lives and reducing adverse outcomes. The perceived credibility of the program increased among students throughout its duration. This aligns with the Health Behavior Model, where behavior depends on the value placed on the action and the expectation of desired outcomes (Lewin, 2013). Some students may have initially undervalued mindfulness but developed an appreciation for it as they progressed. Continued practice relies on cues to action and self-efficacy.

The Social Cognitive Theory emphasizes an individual's active role in decision-making, while reinforcement and incentive value are crucial for behavior (Bandura, 2001). Mindfulness requires consistent practice and skill-building. However, the extent of mindfulness practice outside the MindUP class and its reinforcement beyond the classroom remain unclear. Future studies could measure the frequency and nature of mindfulness practice outside the program and conduct follow-up assessments to understand its long-term effects on mental health outcomes.

Cultural Considerations

Constructs of development go beyond developmental milestones, including development in interactions with others and scaffolding of higher-order mental processes that occur through relationships and cultural socialization (Roeser et al., 2022). Therefore, it is imperative to consider student culture when developing youth programs. In the post-program focus groups, students were provided a developmentally appropriate definition of "culture" and asked if, based on the given definition, the MindUP program

aligned well with their culture, both at home and at school. Students indicated that they believed the program did align well with their present culture. Future research should ensure that specific cultural considerations are adapted to reduce disparities in implementing these programs and student outcomes following these programs (Phan & Renshaw, 2022). Additionally, research should utilize an implementation science approach to identifying the specific needs of students in their current environment and center issues of implementation on equity to serve all students (Baelen et al., 2023; Renshaw & Phan, 2023)

Limitations

Limitations in the present study include small sample size and inability to estimate random effects over time (due to pilot nature). This resulted in insufficient power to detect group differences, necessitating additional analyses to calculate effect sizes and posthoc power. The interpretation of the results may be limited, and future studies with larger samples are needed to measure individual scores over time and include other potential variables of interest.

Another limitation is the reliance on self-report measures from students, which can be influenced by factors like social desirability bias. Incorporating parent and teacher reports in the future could mitigate these biases. The self-report measures may also have been affected by floor or ceiling effects.

Although the study utilized a longitudinal methodology, data collection was confined to a short 12-week timeframe without follow-up assessments. Longer program durations and follow-up measures are recommended to capture potential effects that may emerge or change over time. Starting the program earlier, as noted in the key informant

interviews, may maximize the long-term impact of the program by providing exposure across more developmental stages.

Necessary adaptations to the program's delivery, such as providing the program during the students' enrichment/wellness period instead of the standard classroom setting, may have limited the potential impact. The students in the MindUP program were aware that some classmates were not receiving the program, with raises the possibility of treatment (in this case, intervention) diffusion and reduced intervention effects. Additionally, students' awareness of being compensated for their participation may have influenced their responses to be favorable (Mayeux et al., 2007).

The quantitative and qualitative findings complemented each other in some aspects but not all. Quantitative outcomes focused on mental health, while qualitative findings centered more on acceptability of the program and student opinions. Incorporating discussions about mental health in focus groups discussions was deemed inappropriate due to potential triggering effects. Additionally, the limited number of key informant interviews obtained (teacher and administrator) prevented their inclusion in the results and were referenced only as corroborating evidence from the student focus groups.

Lastly, critics argue that mindfulness is primarily an individual practice and that transforming the education setting itself may be more effective (Ergas, 2019). It is also plausible that certain students benefited more from the program, and future analysis should explore potential moderators of the intervention effects to better understand differential outcomes.

Future Directions

Future research should expand mindfulness programming to a broader range of ages and grades to explore its developmental impact, particularly during adolescence. This could involve implementing mindfulness programs over multiple years or assessing outcomes post-program completion. Including parent and teacher reports alongside student reports can provide diverse perspectives and reduce self-report biases. Additionally, researchers could incorporate biological measures like cortisol levels or physiological indicators during mindfulness practice to assess stress response.

As the importance of supporting adolescent mental health becomes more evident, further research is needed to drive advancements in education, policy, and interventions for this vulnerable population. This project contributes to the growing body of research on school-based mental health programs, particularly those with a mindfulness focus during adolescence.

Conclusions

The present study addresses the role of an in-school mindfulness-based intervention and perceived program credibility on mental health outcomes among youth who are underserved. This work helps us understand the impact of short-term mindfulness programming on adolescent depressive symptomology, anxiety symptomology, and perceived stress at various timepoints throughout the program's implementation. Though the primary hypotheses were not supported, these findings may lend evidence to future research assessing mindfulness-based interventions among youth who are underserved. More research is needed to fully understand the extent to which programs such as MindUP affect mental health outcomes among early adolescents as well as the developmental timing of program implementation. Future research examining this

topic may inform in-school, mindfulness-based interventions to maximize crucial social-emotional learning opportunities for students during this transitional developmental stage.

REFERENCES

Abramson, A. (2022, January). Children's mental health is in crisis. *Monitor on Psychology*, *53*(1). https://www.apa.org/monitor/2022/01/special-childrens-mental-health

Alabama State Department of Education. (2021). *Guidelines for Alabama Public Charter Schools. https://www.alabamaachieves.org/wp-content/uploads/2021/04/PCS-Guidelines-for-Alabama-Public-Charter-Schools.pdf*

Alfonsson, S., Olsson, E., & Hursti, T. (2016). Motivation and treatment credibility predicts dropout, treatment adherence, and clinical outcomes in an internet-based cognitive behavioral relaxation program: a randomized controlled trial. *Journal of medical Internet research*, *18*(3), e5352.

Ali, M. M., West, K., Teich, J. L., Lynch, S., Mutter, R., & Dubenitz, J. (2019). Utilization of mental health services in educational setting by adolescents in the United States. *Journal of School Health*, *89*(5), 393-401.

America's Health Rankings analysis of U.S. HHS, Centers for Medicare & Medicaid Services, National Plan and Provider Enumeration System, United Health Foundation, AmericasHealthRankings.org, Accessed 2022.

Angold, A., Costello, E.J., Messer, S.C., Pickles, A., Winder, F., & Silver, D. (1995). Development of a short questionnaire for use in epidemiological studies of depression in children and adolescence. *International Journal of Methods in Psychiatric Research*, 5, 237- 249.

Arnsten A. F. (2009). Stress signalling pathways that impair prefrontal cortex structure and function. *Nature reviews. Neuroscience*, *10*(6), 410–422. https://doi.org/10.1038/nrn2648

Baelen, R. N., Esposito, M. V., & Galla, B. M. (2019). A selective review of mindfulness training programs for children and adolescents in school settings. In P. A. Jennings, A. A. DeMauro, & P. P. Mischenko (Eds.), The mindful school: Transforming school culture through mindfulness and compassion (pp. 14–56). Guilford Press.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: a conceptual and empirical review. *Clinical psychology: Science and practice*, *10*(2), 125.

Bandura, A. (2001). A cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1-26).

Bandura, A., & Walters, R. H. (1963). Social learning and personality development.

Barrett, P., & Turner, C. (2001). Prevention of anxiety symptoms in primary school children: Preliminary results from a universal school-based trial. *British Journal of Clinical Psychology, 40,* 399–410. doi:10.1348/014466501163887.

Barry, M. M., Clarke, A. M., Jenkins, R., & Patel, V. (2013). A systematic review of the effectiveness of mental health promotion interventions for young people in low and middle income countries. *BMC Public Health, 13,* 1–19. doi:10.1186/1471-2458-13-835.

Beauchemin, J., Hutchins, T. L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning difficulties. *Complementary Health Practice Review, 13*, 34–45.

Bernstein, R. (2016). The mind and mental health: How stress affects the brain. *Health and Human Services*.

Biegel, G. M, Brown, K. W., Shapiro, S. L, & Schubert, C. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Clinical and Consulting Psychology* (in press).

Birmaher, B., Brent, D. A., Chiappetta, L., Bridge, J., Monga, S., & Baugher, M. (1999). Psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED): a replication study. *Journal of the American academy of child & adolescent psychiatry*, *38*(10), 1230-1236.

Bishop, S. R. (2002). What do we really know about mindfulness-based stress reduction?. *Psychosomatic medicine*, *64*(1), 71-83.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... & Devins, G. (2004). Mindfulness: a proposed operational definition. *Clinical psychology: Science and practice*, *11*(3), 230.

Boone Blanchard, S., Ryan Newton, J., Didericksen, K. W., Daniels, M., & Glosson, K. (2021). Confronting racism and bias within early intervention: The responsibility of systems and individuals to influence change and advance equity. *Topics in Early Childhood Special Education*, *41*(1), 6-17.

Bluth, K., Campo, R. A., Pruteanu-Malinici, S., Reams, A., Mullarkey, M., & Broderick, P. C. (2016). A school-based mindfulness pilot study for ethnically diverse at-risk adolescents. *Mindfulness*, *7*(1), 90-104.

Bootzin, R. R., & Stevens, S. J. (2005). Adolescents, substance abuse, and the treatment of insomnia and daytime sleepiness. *Clinical Psychology Review, 25*, 629–644.

Briggs, H. E., Banks, L., & Briggs, A. C. (2014). Increasing knowledge and mental health service use among African Americans through evidence-based practice and cultural injection vector engagement practice approaches. *Best Practices in Mental Health*, *10*(2), 1-14.

Britton, W.B., Lepp, N.E., Niles, H.F., Rocha, T., Fisher, N.E., & Gold, J.S. (2014). A randomised controlled pilot trial of classroom-based mindfulness meditation compared to an active control condition in sixth- grade children. *Journal of School Psychology, 52*(3), 263–278.

Broderick, P. C. (2021). *Learning to breathe: A mindfulness curriculum for adolescents to cultivate emotion regulation, attention, and performance*. New Harbinger Publications.

Broderick, P. C., Frank, J. L., Berrena, E., Schussler, D. L., Kohler, K., Mitra, J., ... & Greenberg, M. T. (2019). Evaluating the quality of mindfulness instruction delivered in school settings: development and validation of a teacher quality observational rating scale. *Mindfulness*, *10*(1), 36-45.

Bronfenbrenner, U. (1974). Developmental research, public policy, and the ecology of childhood. *Child development*, *45*(1), 1-5.

Bronfenbrenner, U. (1994). Ecological models of human development (Vol. 3). *International Encyclopedia of Education*.

Burke, C. A. (2010). Mindfulness-based approaches with children and adolescents: a preliminary review of current research in an emergent field. *J. Child. Fam. Stud.* 19, 133–144. doi: 10.1007/s10826-009-9282-x

Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological science*, *11*(4), 302-306.

CASEL (2020). *Core SEL Competencies*. https://casel.org/fundamentals-of-sel/what-is-the-casel-framework/

Carroll, C., Paterson, M., Wood, S., Booth, A., Rick, J., and Balain, S. (2007). A conceptual framework for implementation fidlity. *Implement. Sci*. 2:40. doi: 10.1186/1748-5908-2-40

Casey, B. J., Getz, S., & Galvan, A. (2008). The adolescent brain. *Developmental review*, *28*(1), 62-77.

Center for Behavioral Health Statistics and Quality. (2021). 2020 National Survey on Drug Use and Health (NSDUH): Methodological summary and definitions. Rockville, MD: Substance Abuse and Mental Health Services Administration. Retrieved from https://www.samhsa.gov/data/

Centers for Disease Control and Prevention. (2019). Adverse childhood experiences (ACEs): preventing early trauma to improve adult health. *Vital Signs*, (November).

Chambers, D. A., Glasgow, R. E., & Stange, K. C. (2013). The dynamic sustainability framework: Addressing the paradox of sustainment amid ongoing change. *Implementation Science, 8*, 117.

Chi, X., Bo, A., Liu, T., Zhang, P., & Chi, I. (2018). Effects of mindfulness-based stress reduction on depression in adolescents and young adults: A systematic review and meta-analysis. *Frontiers in psychology*, *9*, 1034.

Cohen, S., Kamarck, T., & Mermelstein, R. (1994). Perceived stress scale. *Measuring stress: A guide for health and social scientists*, *10*(2), 1-2.

Collins, W. A., Laursen, B., Mortensen, N., Luebker, C., & Ferreira, M. (1997). Conflict processes and transitions in parent and peer relationships: Implications for autonomy and regulation. *Journal of Adolescent Research*, *12*(2), 178-198.

Collins, W. A., & Steinberg, L. (2006). Adolescent development in interpersonal context.

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. *Psychological Bulletin, 127*, 87–127.

Crone, E. A., & Dahl, R. E. (2012). Understanding adolescence as a period of social–affective engagement and goal flexibility. *Nature reviews neuroscience*, *13*(9), 636-650.

Crosnoe, R. (2008). Peer relations, adolescent behavior, and public health research and practice. *Family and Community Health*, S71-S80.

Cummings, J. R., Ponce, N. A., & Mays, V. M. (2010). Comparing racial/ethnic differences in mental health service use among high-need subpopulations across clinical and school-based settings. *Journal of Adolescent health*, *46*(6), 603-606.

Curtin, S. C. (2020). State suicide rates among adolescents and young adults aged 10–24: United States, 2000–2018.

Dahl, R. E. (2008). Biological, developmental, and neurobehavioral factors relevant to adolescent driving risks. *American journal of preventive medicine*, *35*(3), S278-S284.

DeLuca, S. M., Kelman, A. R., & Waelde, L. C. (2018). A systematic review of ethnoracial representation and cultural adaptation of mindfulness- and meditation-based interventions. *Psychological Studies*, *63*(2), 117-129. https://doi.org/10.1007/s12646-018-0452-z

de Vibe, M., Bjørndal, A., Fattah, S., Dyrdal, G. M., Halland, E., & Tanner-Smith, E. E. (2017). Mindfulness-based stress reduction (MBSR) for improving health, quality of

life and social functioning in adults: a systematic review and meta-analysis. *Campbell systematic reviews*, *13*(1), 1-264.

Devilly, G. J., & Borkovec, T. D. (2000). Psychometric properties of the credibility/expectancy questionnaire. *Journal of behavior therapy and experimental psychiatry*, *31*(2), 73-86.

Dhabhar, F. S. (2014). Effects of stress on immune function: the good, the bad, and the beautiful. *Immunologic research*, *58*(2), 193-210.

Dowling, K., Simpkin, A. J., & Barry, M. M. (2019). A cluster randomized-controlled trial of the mindout social and emotional learning program for disadvantaged post-primary school students. *Journal of Youth and Adolescence*, *48*(7), 1245-1263.

Duffy, K. A., McLaughlin, K. A., & Green, P. A. (2018). Early life adversity and health-risk behaviors: proposed psychological and neural mechanisms. *Annals of the New York Academy of Sciences*, *1428*(1), 151-169.

Dunning, D. L., Griffiths, K., Kuyken, W., Crane, C., Foulkes, L., Parker, J., & Dalgleish, T. (2019). Research Review: The effects of mindfulness-based interventions on cognition and mental health in children and adolescents–a meta-analysis of randomized controlled trials. *Journal of Child Psychology and Psychiatry*, *60*(3), 244-258.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child development*, *82*(1), 405-432.

Dutton, M. A., Bermudez, D., Matás, A., Majid, H., & Myers, N. L. (2013). Mindfulness-based stress reduction for low-income, predominantly African American women with PTSD and a history of intimate partner violence. *Cognitive and Behavioral Practice*, *20*(1), 23–32. https://doi.org/10.1016/j.cbpra.2011.08.003

Dye, H. (2018). The impact and long-term effects of childhood trauma. *Journal of Human Behavior in the Social Environment*, *28*(3), 381-392.

Ellis, B. J., Del Giudice, M., Dishion, T. J., Figueredo, A. J., Gray, P., Griskevicius, V., ... & Wilson, D. S. (2012). The evolutionary basis of risky adolescent behavior: implications for science, policy, and practice. *Developmental psychology*, *48*(3), 598.

Ergas, O., & Hadar, L. L. (2019). Mindfulness in and as education: A map of a developing academic discourse from 2002 to 2017. *Review of Education, 7*(3), 757–797.

Erikson, E. H. (1993). *Childhood and society*. WW Norton & Company.

Evans, G. W., & Kim, P. (2013). Childhood poverty, chronic stress, self-regulation, and coping. *Child development perspectives*, *7*(1), 43-48.

Fazel, M., Hoagwood, K., Stephan, S., & Ford, T. (2014). Mental health interventions in schools in high-income countries. *The Lancet Psychiatry*, *1*(5), 377-387.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, *14*(4), 245-258.

Felver, J. C., Clawson, A. J., Morton, M. L., Brier-Kennedy, E., Janack, P., & DiFlorio, R. A. (2019). School-based mindfulness intervention supports adolescent resiliency: A randomized controlled pilot study. *International Journal of School & Educational Psychology*, *7*(sup1), 111-122.

Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M., and Wallace, F. (2005). *Implementation Research: A Synthesis of the Literature*. Tampa, FL: University of South Florida.

Flaherty, E. G., Thompson, R., Litrownik, A. J., Zolotor, A. J., Dubowitz, H., Runyan, D. K., ... & Everson, M. D. (2009). Adverse childhood exposures and reported child health at age 12. *Academic pediatrics*, *9*(3), 150-156.

Folkman, S. (2020). Stress: appraisal and coping. In *Encyclopedia of behavioral medicine* (pp. 2177-2179). Cham: Springer International Publishing.

Friedlaender, D., Burns, D., Lewis-Charp, H., Cook-Harvey, C. M., & Darling-Hammond, L. (2014). Student-centered schools: Closing the opportunity gap (SCOPE Research Brief). *Retrieved from Stanford center for Opportunity Policy in Education website: https://edpolicy. stanford. edu/sites/default/files/scope-pub-student-centered-research-brief. pdf*.

Fung, J., Guo, S., Jin, J., Bear, L., & Lau, A. (2016). A pilot randomized trial evaluating a school-based mindfulness intervention for ethnic minority youth. *Mindfulness*, *7*(4), 819-828.

Fuhrmann, D., Knoll, L. J., & Blakemore, S. J. (2015). Adolescence as a sensitive period of brain development. *Trends in cognitive sciences*, *19*(10), 558-566.

Galván, A. (2014). Insights about adolescent behavior, plasticity, and policy from neuroscience research. *Neuron*, *83*(2), 262-265.

Galván, A. (2021). Adolescent brain development and contextual influences: a decade in review. *Journal of Research on Adolescence*, *31*(4), 843-869.

Garland, A. F., Lau, A. S., Yeh, M., McCabe, K. M., Hough, R. L., & Landsverk, J. A. (2005). Racial and ethnic differences in utilization of mental health services among high-risk youths. *American Journal of Psychiatry*, *162*(7), 1336-1343.

Giedd, J. N. (2015). The amazing teen brain. *Scientific American*, *312*(6), 32-37.

Geiger, A. W., & Davis, L. (2019). A growing number of American teenagers–particularly girls–are facing depression.

Golden, S. D., McLeroy, K. R., Green, L. W., Earp, J. A. L., & Lieberman, L. D. (2015). Upending the social ecological model to guide health promotion efforts toward policy and environmental change. *Health Education & Behavior*, *42*(1_suppl), 8S-14S.

Grant, L. E., Compas, B. E., Thurm, A. E., McMahon, S. D., Gipson, P. Y., Campbell, A. J., et al. (2006). Stressors and child and adolescent psychopathology: evidence of moderating and mediating effects. *Clinical Psychology Review, 26*, 257–283.

Griffith, A. N., Larson, R. W., & Johnson, H. E. (2018). How trust grows: Teenagers' accounts of forming trust in youth program staff. *Qualitative Psychology*, *5*(3), 340.

Griner, D., & Smith, T. B. (2006). Culturally adapted mental health intervention: A meta-analytic review. *Psychotherapy: Theory, research, practice, training*, *43*(4), 531.

Grossman, P., Niemann, L., Schmidt, S., & Walach, H. (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of psychosomatic research*, *57*(1), 35-43.Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: past, present, and future.

Gudino, O. G., Lau, A. S., & Hough, R. L. (2008, June). Immigrant status, mental health need, and mental health service utilization among high-risk Hispanic and Asian Pacific Islander youth. In *Child & Youth Care Forum* (Vol. 37, No. 3, pp. 139-152). Springer US.

Hai, A. H., Franklin, C., Cole Jr, A. H., Panisch, L. S., Yan, Y., & Jones, K. (2021). Impact of MindUP on elementary school students' classroom behaviors: A single-case design pilot study. *Children and Youth Services Review*, *125*, 105981.

Hamburg, D. A., & Takanishi, R. (1989). Preparing for life: The critical transition of adolescence. *American Psychologist*, *44*(5), 825.

Hodgkinson, S., Godoy, L., Beers, L. S., & Lewin, A. (2017). Improving mental health access for low-income children and families in the primary care setting. *Pediatrics*, *139*(1).

Hoover, S., & Bostic, J. (2021). Schools as a vital component of the child and adolescent mental health system. *Psychiatric services*, *72*(1), 37-48.

Horowitz, J. M., & Graf, N. (2019). Most US teens see anxiety and depression as a major problem among their peers. *Pew Res Center*, 1-15.

Humphries, M. L., Williams, B. V., & May, T. (2018). Early childhood teachers' perspectives on social-emotional competence and learning in urban classrooms. *Journal of applied school psychology*, *34*(2), 157-179.

Ibrahim, J. G., & Molenberghs, G. (2009). Missing data methods in longitudinal studies: a review. *Test*, *18*(1), 1-43.

Ivanovski, B., & Malhi, G. S. (2007). The psychological and neurophysiological concomitants of mindfulness forms of meditation. *Acta neuropsychiatrica*, *19*(2), 76-91.

Jackman, K., Kreuze, E. J., Caceres, B. A., & Schnall, R. (2020). Bullying and peer victimization of minority youth: Intersections of sexual identity and race/ethnicity. *The Journal of School Health*, *90*(5), 368–377. https://doi.org/10.1111/josh.12883

Jennings, P.A. Minding the Gap: Attending to Implementation Science and Practice in School-Based Mindfulness Program Research. *Mindfulness* (2023).

Johnson, C., Burke, C., Brinkman, S., & Wade, T. (2016). Effectiveness of a school-based mindfulness program for transdiagnostic prevention in young adolescents. *Behaviour research and therapy*, *81*, 1-11.

Johnson, C., Burke, C., Brinkman, S., & Wade, T. (2017). A randomized controlled evaluation of a secondary school mindfulness program for early adolescents: Do we have the recipe right yet?. *Behaviour Research and Therapy*, *99*, 37-46.

Jones, S. M., Barnes, S. P., Bailey, R., & Doolittle, E. J. (2017). Promoting social and emotional competencies in elementary school. *The future of children*, 49-72.

Joyce, A., Etty-Leal, J., Zazryn, T., Hamilton, A. & Hassed, C. (2010). Exploring a mindfulness meditation program on the mental health of upper primary children: A pilot study. *Advances in School Mental Health Promotion, 3*(2), 17–25.

Kabat-Zinn, J., & Hanh, T. N. (2009). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delta.

Kabat-Zinn, J. (2013). *Full catastrophe living, revised edition: how to cope with stress, pain and illness using mindfulness meditation*. Hachette uK.

Kann L, McManus T, Harris WA, et.al. Youth Risk Behavior Surveillance – United States, 2017. MMWR Surveil Summ 2018;67 (No. 8):1-479.

Kataoka, S., Stein, B. D., Nadeem, E., & Wong, M. (2007). Who gets care? Mental health service use following a school-based suicide prevention program. *Journal of the American Academy of Child & Adolescent Psychiatry*, *46*(10), 1341-1348.

Kasl, S. V., & Cobb, S. (1966). Health behavior, illness behavior and sick role behavior: I. Health and illness behavior. *Archives of Environmental Health: An International Journal*, *12*(2), 246-266.

Kechter, A., Black, D. S., Riggs, N. R., Warren, C. M., Ritt-Olson, A., Chou, C. P., & Pentz, M. A. (2019). Factors in the perceived stress scale differentially associate with

mindfulness disposition and executive function among early adolescents. *Journal of child and family studies*, *28*(3), 814-821.

Keenan, K., Shaw, D. S., Walsh, S., Delliquadri, E., & Giovanelli, J. (1997). DSM-III-R disorders in pre-school children from low-income families. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 620–627.

Kelly, B., & Perkins, D. F. (Eds.). (2012). *Handbook of implementation science for psychology in education*. Cambridge University Press.

Kent, L., Vostanis, P., & Feehan, C. (1997). Detection of major and minor depression in children and adolescents: evaluation of the Mood and Feelings Questionnaire. *Journal of Child Psychology and Psychiatry*, *38*(5), 565-573

Kern, L., George, M. P., & Weist, M. (2016). *Step-by-step support for students with emotional and behavioral problems: Prevention and intervention strategies*. Baltimore, MD: Paul H. Brookes.

Kern, L., Mathur, S.R., Albrecht, S.F. *et al.* The Need for School-Based Mental Health Services and Recommendations for Implementation. *School Mental Health* **9,** 205–217 (2017). https://doi.org/10.1007/s12310-017-9216-5

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of general psychiatry*, *62*(6), 617-627.

Khalsa, S. B. S., Hickey-Schultz, L., Cohen, D., Steiner, N., & Cope, S. (2012). Evaluation of the mental health benefits of yoga in a secondary school: A preliminary randomized controlled trial. *The journal of behavioral health services & research*, *39*(1), 80-90.

Kim, S., Crooks, C. V., Bax, K., & Shokoohi, M. (2021). Impact of trauma-informed training and mindfulness-based social–emotional learning program on teacher attitudes and burnout: A mixed-methods study. *School mental health*, *13*(1), 55-68.

King, S, Smoski, M.J., & C. J. Robbins, (2011). Effects of mindfulness on psychological health, *Clinical Psychology Review, 31(6),* 1041-1056.

Kitchener, B. A., & Jorm, A. F. (2008). Mental Health First Aid: an international programme for early intervention. *Early Intervention in Psychiatry*, *2*(1), 55-61.

Klimes-Dougan, B., August, G., Lee, C.-Y. S., Realmuto, G. M., Bloomquist, M. L., Horowitz, J. L., et al. (2009). Practitioner and site characteristics that relate to fidelity of implementation: the early risers prevention program in a going-to-scale intervention trial. *Prof. Psychol. Res. Pract*. 40, 467–475. doi: 10.1037/a0014623

Kostova, Z., Levin, L., Lorberg, B., D. Ziedonis (2019). Mindfulness based interventions for adolescents with mental health conditions: a systematic review of the literature. Journal of Child and Family Studies, 28, 2633-2649.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of general internal medicine*, *16*(9), 606-613.

Kwong, A. S., Manley, D., Timpson, N. J., Pearson, R. M., Heron, J., Sallis, H., ... & Leckie, G. (2019). Identifying critical points of trajectories of depressive symptoms from childhood to young adulthood. *Journal of youth and adolescence*, *48*(4), 815-827.

Lawlor, M. S. (2016). Mindfulness and social emotional learning (SEL): A conceptual framework. In *Handbook of mindfulness in education* (pp. 65-80). Springer, New York, NY.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer publishing company.

Lewin, K. (2013). *A dynamic theory of personality-selected papers*. Read Books Ltd.

Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of aspiration.

Linehan, M. M. (2018). *Cognitive-behavioral treatment of borderline personality disorder*. Guilford Publications.

Luthar, S. S. (1993). Methodological and conceptual issues in research on childhood resilience. *Journal of Child Psychology and Psychiatry*, 34, 441–453. doi:10.1111/jcpp.1993.34.issue-4

Maher, E. J., Jackson, L. J., Pecora, P. J., Schltz, D. J., Chandra, A., and Barnes-Proby, D. S. (2009). Overcoming challenges to implementing and evaluating evidence -based interventions in child welfare: a matter of necessity. *Child. Youth Serv. Rev.* 31, 555–562. doi: 10.1016/j.childyouth.2008.10.013

Mahoney, J. L., Weissberg, R. P., Greenberg, M. T., Dusenbury, L., Jagers, R. J., Niemi, K., ... & Yoder, N. (2021). Systemic social and emotional learning: Promoting educational success for all preschool to high school students. *American Psychologist*, *76*(7), 1128.

Maloney, J. E. (2015). *Early adolescents' evaluations of MindUP: a universal mindfulness-based social and emotional learning program* (Doctoral dissertation, University of British Columbia).

Maloney, J. E., Lawlor, M. S., Schonert-Reichl, K. A., & Whitehead, J. (2016). A mindfulness-based social and emotional learning curriculum for school-aged children: the MindUP program. In *Handbook of mindfulness in education* (pp. 313-334). Springer, New York, NY.

Mayeux, L., Underwood, M. K., & Risser, S. D. (2007). Perspectives on the ethics of sociometric research with children: How children, peers, and teachers help to inform the debate. *Merrill-Palmer Quarterly (1982-)*, 53-78.

McEwen, B. S., Bowles, N. P., Gray, J. D., Hill, M. N., Hunter, R. G., Karatsoreos, I. N., & Nasca, C. (2015). Mechanisms of stress in the brain. *Nature neuroscience*, *18*(10),

1353-1363. McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2012). Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. *Archives of general psychiatry*, *69*(11), 1151-1160.

McIntosh, K., Mercer, S. H., Nese, R. N., & Ghemraoui, A. (2016). Identifying and predicting distinct patterns of implementation in a school-wide behavior support framework. *Prevention Science*, *17*(8), 992-1001.

Merikangas KR, He JP, Burstein M, et al: Lifetime prevalence of mental disorders in US adolescents: Results from the National Comorbidity Study – Adolescent Supplement (NCS-A). J Am Acad Child Adolesc Psychiatry 49(10):980-989, 2010.

Merikangas, K. R., He, J. P., Burstein, M., Swendsen, J., Avenevoli, S., Case, B., ... & Olfson, M. (2011). Service utilization for lifetime mental disorders in US adolescents: results of the National Comorbidity Survey–Adolescent Supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*(1), 32-45.

Messer, S.C., Angold, A., Costello, J., Loeber, R., Van Kammen, W., & Stouthamer-Lober, M. (1995). Development of a short questionnaire for use in epidemiological studies of depression in children and adolescence: Factor composition and structure across development. *International Journal of Methods in Psychiatric Research,* 5, 251- 262.

Mihalic, S. (2004). The importance of implementation fidelity. *Emotional and Behavioral Disorders in Youth*, *4*(4), 83-105.

Miller, J. J., Fletcher, K., & Kabat-Zinn, J. (1995). Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry*, *17*(3), 192–200. https://doi.org/10.1016/0163-8343(95)00025-m

Moir, T. (2018, July). Why is implementation science important for intervention design and evaluation within educational settings?. In *Frontiers in Education* (Vol. 3, p. 61). Frontiers Media SA.

Mongelli, F., Georgakopoulos, P., & Pato, M. T. (2020). Challenges and Opportunities to Meet the Mental Health Needs of Underserved and Disenfranchised Populations in the United States. *Focus (American Psychiatric Publishing)*, *18*(1), 16–24. https://doi.org/10.1176/appi.focus.20190028

Morgan, D. L. (1996). *Focus groups as qualitative research* (Vol. 16). Sage publications.

National Center for Education Statistics, & Elias, J., Roughly Half of Public Schools Report That They Can Effectively Provide Mental Health Services to All Students in Need (2022). Retrieved 2022, from https://nces.ed.gov/whatsnew/press_releases/05_31_2022_2.asp.

O'Connor, P. J., Martin, B., Weeks, C. S., & Ong, L. (2014). Factors that influence young people's mental health help-seeking behaviour: a study based on the Health Belief Model. *Journal of advanced nursing*, *70*(11), 2577-2587.

Odom, S. L., Brantlinger, E., Gersten, R., Horner, R. H., Thompson, B., & Harris, K. R. (2005). Research in special education: Scientific methods and evidence-based practices. *Exceptional Children, 71,* 137–148. doi:10.1177/001440290507100201.

Olano, H. A., Kachan, D., Tannenbaum, S. L., Mehta, A., Annane, D., & Lee, D. J. (2015). Engagement in mindfulness practices by U.S. adults: Sociodemographic barriers. *The Journal of Alternative and Complementary Medicine*, *21*(2), 100–102. https://doi.org/10.1089/acm.2014.0269

Olden, K., & White, S. L. (2005). Health-related disparities: influence of environmental factors. *Medical Clinics*, *89*(4), 721-738.

Paus, T., Keshavan, M., & Giedd, J. N. (2008). Why do many psychiatric disorders emerge during adolescence? *Nature reviews neuroscience*, *9*(12), 947-957.

Perry-Parrish, C., Copeland-Linder, N., Webb, L., Shields, A. H., & Sibinga, E. M. (2016). Improving self-regulation in adolescents: current evidence for the role of mindfulness-based cognitive therapy. *Adolescent health, medicine and therapeutics*, *7*, 101.

Phan, M. L., & Renshaw, T. L. (2021). Guidelines for Adapting Evidence-based Interventions with Marginalized Youth in Under-Resourced Schools.

Proulx, J., Croff, R., Oken, B., Aldwin, C. M., Fleming, C., Bergen-Cico, D., ... & Noorani, M. (2018). Considerations for research and development of culturally relevant mindfulness interventions in American minority communities. *Mindfulness*, *9*(2), 361-370.

QSR International Pty Ltd. (2020) NVivo (released in March 2020), https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

Reangsing, C., Punsuwun, S., & Schneider, J. K. (2021). Effects of mindfulness interventions on depressive symptoms in adolescents: A meta-analysis. *International journal of nursing studies*, *115*, 103848.

Reinert, M., Fritze, D., & Nguyen, T. (2021). The State of Mental Health in America 2022.

Renshaw, T.L. & Phan, M.L. (2023). Using implementation reporting to advance culturally sensitive and equity focused mindfulness programs in schools. *Mindfulness*, 13.

Roeser, R. W., & Peck, S. C. (2009). An education in awareness: Self, motivation, and self-regulated learning in contemplative perspective. *Educational psychologist*, *44*(2), 119-136.

Romer, D., Reyna, V. F., & Satterthwaite, T. D. (2017). Beyond stereotypes of adolescent risk taking: Placing the adolescent brain in developmental context. *Developmental cognitive neuroscience*, *27*, 19-34.

Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health education monographs*, *2*(4), 328-335.

Rosenthal, L. (1971). Some dynamics of resistance and therapeutic management in adolescent group therapy. *Psychoanalytic Review*, *58*(3), 353-366.

Roth, B., & Robbins, D. (2004). mindfulness-based stress reduction and health-related quality of life: Findings from a bilingual inner-city patient population. *Psychosomatic Medicine*, *66*(1), 113–123. https://doi.org/10.1097/01.PSY.0000097337.00754.09

Sallis, J. F., Owen, N., & Fisher, E. (2015). Ecological models of health behavior. *Health behavior: Theory, research, and practice*, *5*(43-64).

Schonert-Reichl, K. A., & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre-and early adolescents' well-being and social and emotional competence. *Mindfulness*, *1*(3), 137-151.

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental psychology*, *51*(1), 52.

Segal, Z. V., Williams, M., & Teasdale, J. (2018). *Mindfulness-based cognitive therapy for depression*. Guilford Publications.

Sekhar DL, Schaefer EW, Waxmonsky JG, et al. Screening in High Schools to Identify, Evaluate, and Lower Depression Among Adolescents: A Randomized Clinical Trial. *JAMA Netw Open.* 2021;4(11):e2131836. doi:10.1001/jamanetworkopen.2021.31836

Shigaki, C. L., Glass, B., & Schopp, L. H. (2006). Mindfulness-based stress reduction in medical settings. *Journal of Clinical Psychology in Medical Settings*, *13*(3), 209-216.

Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of clinical psychology*, *62*(3), 373-386.

Shapiro, S. L., & Carlson, L. E. (2009). *The art and science of mindfulness: Integrating mindfulness into psychology and the helping professions*.

Sharma, M. (2021). *Theoretical foundations of health education and health promotion*. Jones & Bartlett Learning.

Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The sustainability of evidence-based interventions and practices in public health and health care. *Annual Review of Public Health, 39*, 55–76.

Sibinga, E., Perry-Parrish, C., Chung, S., Johnson, S., Smith, M., & Ellen, J.M. (2013). School-based mindfulness instruction for urban male youth: a small randomised controlled trial. *Preventive Medicine, 57*(6)*,* 799–801.

Sibinga, E., Webb, L., Ghazarian, S.R., & Ellen, J.M. (2016). School-based mindfulness instruction: An RCT. *Paediatrics, 137*(1):e20152532.

Singh, N. N., Lancioni, G. E., Singh, A. N., Winton, A. S. W., Singh, J., McAleavey, K. M., et al. (2008). A mindfulness-based health wellness program for an adolescent with Prader-Willi syndrome. *Behavior Modification, 32*, 167–181.

Skinner, C. S., Tiro, J., & Champion, V. L. (2015). The health belief model. Health behavior: theory, research, and practice.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, *166*(10), 1092-1097.

Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental review*, *28*(1), 78-106.

Thierry, K. L., Bryant, H. L., Nobles, S. S., & Norris, K. S. (2016). Two-year impact of a mindfulness-based program on preschoolers' self-regulation and academic performance. *Early Education and Development*, *27*(6), 805-821.

Thierry, K. L., Vincent, R. L., Bryant, H. L., Kinder, M. B., & Wise, C. L. (2018). A self-oriented mindfulness-based curriculum improves prekindergarten students' executive functions. *Mindfulness*, *9*(5), 1443-1456.

Turner, E. A., Jensen-Doss, A., & Heffer, R. W. (2015). Ethnicity as a moderator of how parents' attitudes and perceived stigma influence intentions to seek child mental health services. *Cultural Diversity and Ethnic Minority Psychology*, *21*(4), 613.

Twenge, J. M., Cooper, A. B., Joiner, T. E., Duffy, M. E., & Binau, S. G. (2019). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005–2017. *Journal of abnormal psychology*, *128*(3), 185.

U.S. Census Bureau. (2020). *Current Population Survey, Annual Social and Economic Supplement, 2019.* Washington, DC: U.S. Census Bureau, Population Division. https://www2.census.gov/programs-surveys/demo/tables/age-and-sex/2019/age-sex-composition/2019gender_table1.xlsx [b]

Van de Weijer-Bergsma, E., Lagenberg, G., Brandsma, R., Oort, F. J., S. M. Bogels (2014). The effectiveness of a school-based mindfulness training as a program to prevent stress in elementary school children. Mindfulness, 5, 238-248.

Virgili, M. (2015). Mindfulness-based interventions reduce psychological distress in working adults: a meta-analysis of intervention studies. *Mindfulness* 6, 326–337. doi: 10.1007/s12671-013-0264-0

Vogel, S., & Schwabe, L. (2016). Learning and memory under stress: implications for the classroom. *npj Science of Learning*, *1*(1), 1-10.

Wang, P. S., Lane, M., Olfson, M., Pincus, H. A., Wells, K. B., & Kessler, R. C. (2005). Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Archives of general psychiatry*, *62*(6), 629-640.

Walker, E. F. (2002). Adolescent neurodevelopment and psychopathology. *Current Directions in Psychological Science*, *11*(1), 24-28.

Weisz, J. R., Jensen-Doss, A., & Hawley, K. M. (2006). Evidence-based youth psychotherapies versus usual clinical care: a meta-analysis of direct comparisons. *American Psychologist*, *61*(7), 671.

White, B. P. (2014). The perceived stress scale for children: a pilot study in a sample of 153 children. *International Journal of Pediatrics and Child Health*, *2*(2), 45-52.

Yeager, D. S. (2017). Social and emotional learning programs for adolescents. *The future of children*, 73-94.

Zenner, C. Herrnleben-Kurz, S. and H. Walach (2014). Mindfulness-based interventions in schools – a systematic review and meta-analysis. Frontiers in Psychology, 5, 1-20.

Zoogman, S., Goldberg, S. B., Hoyt, W. T., and Miller, L. (2015). Mindfulness interventions with youth: a meta-analysis. *Mindfulness* 6, 290–302. doi: 10.1007/s12671-013-0260-4

Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, S. T., et al. (2007). Mindfulness meditation training with adults and adolescents with ADHD. *Journal of Attention Disorders, 11*, 737–746.

Table 1

Characteristics of Student Participants by Intervention Group

Baseline characteristic	MindUP Group		Control Group		Full Sample	
	n	%	*n*	%	*n*	%
Gender Identity						
Female	12	50.0	12	50.0	24	50.0
Male	11	45.8	12	50.0	23	47.9
Non-Binary	1	4.2	0	0.0	1	2.1
Racial Identity						
Black/African American	19	79.2	20	83.3	39	81.3
White	4	16.7	3	12.5	7	14.6
Two or More Races	1	4.2	1	4.2	1	2.1
American Indian/Alaskan Native	0	0	1	4.2	1	2.1
Ethnic Identity						
Hispanic/Latino	1	4.4	2	8.3	3	6.3
Non-Hispanic/Non-Latino	23	95.6	22	91.7	45	93.8

Note. $N = 48$ ($n = 24$ for each group). Participants were on average 10.2 years old at baseline.

Table 2

Predictor and Outcome Descriptives by Intervention Group

Variable	MindUP Group		Control Group		Full Sample	
	Mean	SD	Mean	SD	Mean	SD
Perceived Stress TP 0	23.46	6.01	22.17	5.97	22.83	5.96
Perceived Stress TP 1	20.74	5.90	22.61	6.30	21.67	6.11
Perceived Stress TP 2	21.04	4.86	22.35	4.27	21.70	4.57
Perceived Stress TP 3	21.79	6.90	22.50	7.53	22.13	7.14
Depressive Symptoms TP 0	7.58	6.37	7.61	5.50	7.60	5.90
Depressive Symptoms TP 1	7.30	6.74	7.43	7.08	7.37	6.84
Depressive Symptoms TP 2	7.09	7.04	7.65	6.93	7.37	6.91
Depressive Symptoms TP 3	7.21	7.69	8.64	7.59	7.89	7.59
Anxiety Symptoms TP 0	2.41	1.65	2.74	1.91	2.58	1.78
Anxiety Symptoms TP 1	2.70	2.06	3.17	2.21	2.93	2.12
Anxiety Symptoms TP 2	2.70	2.14	3.43	2.25	3.07	2.21
Anxiety Symptoms TP 3	2.58	2.69	3.05	2.85	2.80	2.75
Program Credibility TP 0	42.68	8.15	-	-	-	-
Program Credibility TP 1	40.91	9.34	-	-	-	-
Program Credibility TP 2	44.05	7.26	-	-	-	-
Program Credibility TP 3	45.55	7.56	-	-	-	-

Table 3

Correlations Among Study Variables

	1	2	3	4	5	6
1. Other Gender Identity	1					
2. Other Racial Identity	-0.18	1				
3. Intervention Group	0.06	-0.53	1			
4. Depressive Symptomology TP1	0.15	0.15	-0.02	1		
5. Anxiety Symptomology TP1	0.23	0.23	-0.10	**0.40****	1	
6. Perceived Stress TP1	0.11	0.09	-0.12	-0.07	-0.06	1

Note. * $p < .05$; ** $p < .01$; Spearman's Rho presented for Racial Identity (1=White, 2=Black/African American, 3=Asian, 4=Native American or Other Pacific Islander, 5=American Indian or Alaskan Native, 6=Two or More Racial Identities, 7=Other Racial Identity), Gender Identity (0=Female, 1=Male, 2=Other Gender Identity), and Intervention Group (0 = Control Group, 1 = MindUP Group)

Table 4

Intervention Group Status Predicting Depressive Symptomology

		Model A	Model B	Model C	Model D
Fixed Effects					
Initial Status, (π_{0i})	Intercept	**7.54***** (0.88)	**7.28***** (0.97)	1.22 (1.23)	1.23 (1.44)
	Baseline Depressive Symptomology			**0.80***** (0.13)	**0.80***** (0.13)
	Intervention Group				-0.37 (1.49)
Rate of Change, (π_{1i})	Intercept		0.26 (0.41)	0.73 (0.67)	1.04 (0.78)
	Baseline Depressive Symptomology			-0.06 (0.07)	-0.06 (0.07)
	Intervention Group				-0.62 (0.81)
Variance Components					
Level 1	Within-person	**15.92***** (2.30)	**15.86***** (2.29)	**15.73***** (2.27)	**15.63***** (2.26)
Level 2	In initial status	**31.69***** (7.59)	**31.71***** (7.59)	**13.63***** (3.93)	**13.55***** (3.90)
	In rate of change	-	-	-	-
	Covariance	-	-	-	-
Goodness-of-fit					
	Deviance	900.4	900.0	866.9	866.1
	AIC	906.4	908.0	878.9	882.1
	BIC	912.0	915.5	890.2	897.0

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

Table 5

Means, Standard Deviations, and One-Way Analysis of Covariance for Depressive Symptomology by Timepoint

Variable	MindUP		Control		$F(1, 45)$	η^2
	M	*SD*	*M*	*SD*		
Depressive Symptomology						
TP 1	7.43	6.93	7.31	6.59	0.01	.000
TP 2	7.64	6.78	7.10	6.88	0.12	.003
TP 3	8.57	7.26	7.21	7.69	0.53	.012

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

Table 6

Intervention Group Status Predicting Anxiety Symptomology

		Model A	Model B	Model C	Model D
Fixed Effects					
Initial Status, (π_{0i})	Intercept	**2.93***** (0.27)	**3.00***** (0.32)	**2.06**** (0.54)	**2.31**** (0.63)
	Baseline Anxiety Symptomology			**0.36*** (0.17)	**0.35*** (0.17)
	Intervention Group				-0.44 (0.59)
Rate of Change, (π_{1i})	Intercept		-0.07 (0.17)	-0.28 (0.31)	-0.30 (0.36)
	Baseline Anxiety Symptomology			0.08 (0.10)	0.09 (0.10)
	Intervention Group				0.03 (0.34)
Variance Components					
Level 1	Within-person	**2.79***** (0.40)	**2.78***** (0.40)	**2.76***** (0.40)	**2.76***** (0.40)
Level 2	In initial status	**2.51***** (0.71)	**2.51***** (0.71)	**1.93***** (0.60)	**1.89***** (0.59)
	In rate of change	-	-	-	-
	Covariance	-	-	-	-
Goodness-of-fit					
	Deviance	619.1	618.9	609.4	608.7
	AIC	625.1	626.9	621.4	624.7
	BIC	630.7	634.4	632.6	639.7

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

Table 7

Means, Standard Deviations, and One-Way Analysis of Covariance for Anxiety Symptomology by Timepoint

Variable	MindUP		Control		$F(1, 45)$	η^2
	M	*SD*	*M*	*SD*		
Anxiety Symptomology						
TP 1	2.71	2.01	3.16	2.16	0.36	.008
TP 2	2.71	2.01	3.42	2.21	0.94	.020
TP 3	2.58	2.69	3.03	2.73	0.14	.003

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

Table 8

Intervention Group Status Predicting Perceived Stress

		Model A	Model B	Model C	Model D
Fixed Effects					
Initial Status, (π_{0i})	Intercept	**21.83***** (0.66)	**21.61***** (0.80)	**16.03***** (3.19)	**16.65***** (3.20)
	Baseline Perceived Stress			0.24 (0.14)	**0.26*** (0.14)
	Intervention Group				-2.13 (1.58)
Rate of Change, (π_{1i})	Intercept		0.23 (0.46)	3.08 (1.82)	2.87 (1.83)
	Baseline Perceived Stress			-0.12 (0.08)	-0.13 (0.08)
	Intervention Group				0.72 (0.90)
Variance Components					
Level 1	Within-person	**20.00***** (2.89)	**19.95***** (2.88)	**19.42***** (2.80)	**19.29***** (2.78)
Level 2	In initial status	**14.14***** (4.35)	**14.15***** (4.35)	**13.85***** (4.25)	**13.40***** (4.15)
	In rate of change	-	-	-	-
	Covariance	-	-	-	-
Goodness-of-fit					
	Deviance	894.7	894.4	890.7	888.9
	AIC	900.7	902.4	902.7	904.9
	BIC	906.3	909.9	913.9	919.8

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

Table 9

Means, Standard Deviations, and One-Way Analysis of Covariance for Perceived Stress by Timepoint

Variable	MindUP		Control		$F(1, 45)$	η^2
	M	*SD*	*M*	*SD*		
Perceived Stress						
TP 1	20.78	5.77	22.57	6.17	1.59	.034
TP 2	21.07	4.75	22.32	4.18	1.16	.025
TP 3	21.79	6.90	22.47	7.20	0.11	.002

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

Table 10

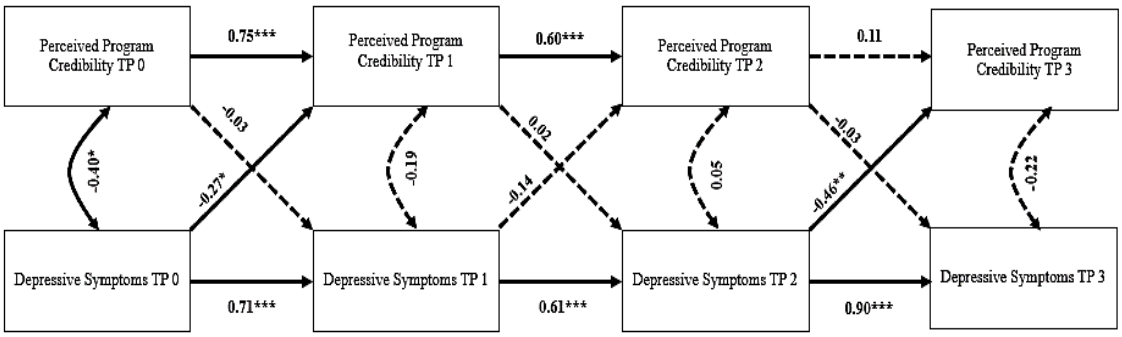
Perceived Program Credibility Predicting Depressive Symptomology (MindUP Group Only)

		Model A	Model B	Model C	Model D
Fixed Effects					
Initial Status, (π_{0i})	Intercept	**7.20*** (1.26)	**7.25*** (1.38)	1.40 (1.63)	1.63 (1.64)
	Baseline Depressive Symptomology			**0.77*** (0.17)	**0.71*** (0.18)
	Program Credibility				-0.08 (0.12)
Rate of Change, (π_{1i})	Intercept		-0.05 (0.56)	0.43 (0.88)	0.79 (0.95)
	Baseline Depressive Symptomology			-0.06 (0.09)	-0.07 (0.10)
	Program Credibility				-0.05 (0.09)
Variance Components					
Level 1	Within-person	**15.16*** (3.10)	**15.16*** (3.09)	**15.00*** (3.06)	**14.52*** (2.98)
Level 2	In initial status	**32.74**** (10.96)	**32.74**** (10.96)	**13.22**** (5.36)	**12.52**** (5.16)
	In rate of change	-	-	-	-
	Covariance	-	-	-	-
Goodness-of-fit					
	Deviance	448.4	448.4	430.4	427.6
	AIC	454.4	456.4	442.4	443.6
	BIC	457.9	461.1	449.4	453.1

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

Figure 1

Perceived Program Credibility and Depressive Symptomatology Cross-Lagged Model



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

Table 11

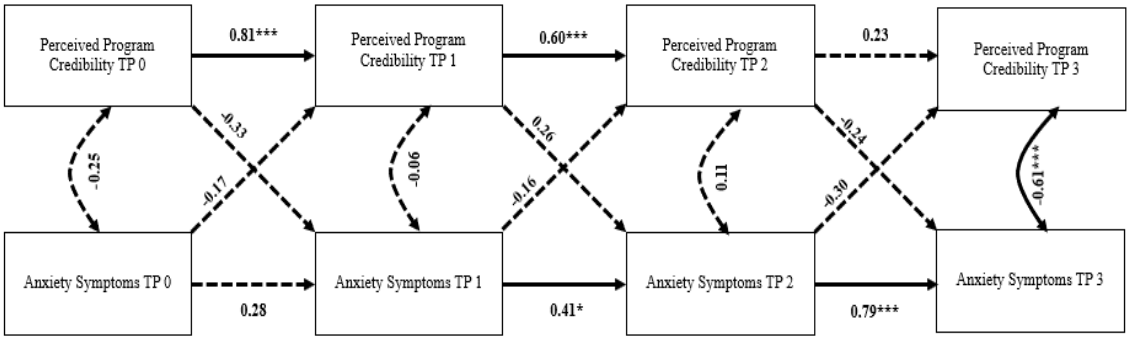
Perceived Program Credibility Predicting Anxiety Symptomology (MindUP Group Only)

		Model A	Model B	Model C	Model D
Fixed Effects					
Initial Status, (π_{0i})	Intercept	**2.67*** (0.38)	**2.72*** (0.44)	**1.75*** (0.79)	**1.78*** (0.75)
	Baseline Anxiety Symptomology			0.40 (0.27)	0.35 (0.27)
	Program Credibility				-0.03 (0.04)
Rate of Change, (π_{1i})	Intercept		-0.06 (0.22)	0.10 (0.41)	0.37 (0.44)
	Baseline Anxiety Symptomology			-0.07 (0.14)	-0.12 (0.15)
	Program Credibility				-0.03 (0.03)
Variance Components					
Level 1	Within-person	**2.35*** (0.48)	**2.35*** (0.48)	**2.34*** (0.48)	**2.29*** (0.47)
Level 2	In initial status	**2.65**** (1.00)	**2.65**** (1.00)	**2.39**** (0.93)	**1.93**** (0.82)
	In rate of change	-	-	-	-
	Covariance	-	-	-	-
Goodness-of-fit					
	Deviance	301.3	301.2	299.1	294.4
	AIC	307.3	309.2	311.1	310.4
	BIC	310.8	313.9	318.1	319.8

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

Figure 2

Perceived Program Credibility and Anxiety Symptomatology Cross-Lagged Model



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

Table 12

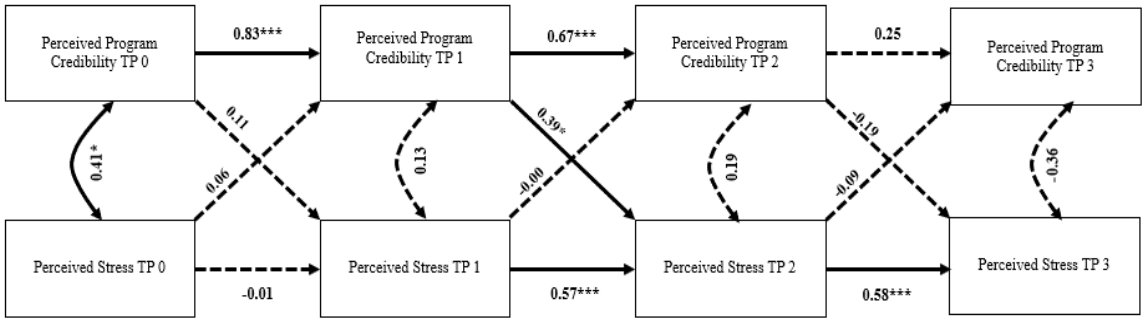
Perceived Program Credibility Predicting Perceived Stress (MindUP Group Only)

		Model A	Model B	Model C	Model D
Fixed Effects					
Initial Status, (π_{0i})	Intercept	**21.21***** (0.94)	**20.71***** (1.12)	**18.41***** (4.57)	**19.89***** (4.77)
	Baseline Perceived Stress			0.10 (0.19)	0.04 (0.19)
	Program Credibility				0.10 (0.12)
Rate of Change, (π_{1i})	Intercept		0.51 (0.61)	3.64 (2.47)	2.40 (2.68)
	Baseline Perceived Stress			-0.13 (0.10)	-0.08 (0.11)
	Program Credibility				-0.11 (0.09)
Variance Components					
Level 1	Within-person	**18.17***** (3.71)	**17.91***** (3.66)	**17.29***** (3.53)	**17.12***** (3.51)
Level 2	In initial status	**15.05**** (6.22)	**15.14**** (6.21)	**15.30**** (6.19)	**14.52**** (6.01)
	In rate of change	-	-	-	-
	Covariance	-	-	-	-
Goodness-of-fit					
	Deviance	443.1	442.4	440.6	439.2
	AIC	449.1	450.0	452.6	455.2
	BIC	452.6	455.1	459.7	464.6

* $p < .05$; ** $p < .01$; *** $p < .00$

Figure 3

Perceived Program Credibility and Perceived Stress Cross-Lagged Model



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

Table 13

Perceived Program Credibility Over Time (MindUP group Only)

		Model A	Model B
Fixed Effects			
Initial Status, (π_{0i})	Intercept	0.02 (1.17)	-2.30 (1.45)
	Baseline Program Credibility		
Rate of Change, (π_{1i})	Intercept		**2.32**** (0.85)
	Baseline Perceived Stress		
Variance Components			
Level 1	Within-person	**40.43***** (8.25)	**35.06***** (7.16)
Level 2	In initial status	**19.30*** (9.85)	**21.09*** (9.76)
	In rate of change	-	-
	Covariance	-	-
Goodness-of-fit			
	Deviance	492.0	485.2
	AIC	498.0	493.2
	BIC	501.6	497.9

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

Table 14

Student Focus Group Discussion Themes and Illustrative Quotes

Discourse and dimension	Example quote
Takeaways from the MindUP program	
Thinking before acting or reacting	"We learned you should always… think about what you are going to say before you actually say it."
	"Think before you do something."
Using mindful senses	"I learned you can do things mindfully … with any sense. Taste, smell, sight, hearing, anything."
	"Something that I learned… was that you can do mindfulness tasting."
	"Mindful smelling (did not seem useful)."
Parts of the brain affected by mindfulness (neuroscience)	"I learned about the owl and your guard dog."
	"…the frontal lobe. The elephant…"
Taking a "brain break" or breathing to manage emotions	"I learned that you should just breathe sometimes."
Practicing empathy towards others	"We… learned to put yourself in other people's shoes."
	"It is important to care about people and their feelings."
Liked about MindUP program	
Break from other classes	"I liked that it gave me a break from… the class and all that."
Relaxing and deep breathing	"I liked that it gave me peace of mind."
Hearing perspectives/feelings from classmates	"(Liked) the people… hearing their feelings."
	"Seeing things from other people's perspective."
Activities in the MindUP program	"(Liked) the tasks, the breathing, and the going outside."
	"I liked… when we got to draw and write in our journals and when we got to decorate them."

Disliked about MindUP program	
Final activity (community project)	"…I disliked the ending part when we did that little reading thing. It's just cringy."
	"…the ending part like she said. I did not like that at all because nobody was actually being mindful they were only doing it because they wanted to participate."
Missing other class activities	"Something that I disliked was… sometimes we get to do fun stuff in our classes and I missed it…"
Having to participate on hard/bad days	"I went to every single class and I enjoyed it, and sometimes I didn't because it was a bad day and I just wanted to go home."
	"-…sometimes I just wanted to go to sleep."
Challenges during MindUP program	
Expressing personal feelings	"(What was) challenging about it was we had these little bullet (points) and we had to write our feelings down and draw out feelings and stuff."
	"Just telling really personal stuff."
Consistent practice of mindfulness	"Something that was hard for me was being mindful because I'm not very mindful and I… struggled with getting back into the state of being mindful because I don't practice that much."
	"It's kind of challenging… being calm and mindful of your surroundings."
Usefulness of practices for them or people their age	
Managing anger and reactions to certain situations (take a brain break)	"…really helped me relax."
	"It helped me because I would get really mad sometimes over little small stuff."

	"When people are saying something disrespectful, it taught me how to breathe."
Reasons why people in the fifth-grade might use mindfulness skills	
To control emotions	"…some of them have anger issues or have problems with showing their emotions."
	"…some people have really bad anger issues that they need to get resolved and some people need it because they have a lot going on in their everyday basic lives."
	"Because if you get angry at one point you can meditate or take ten deep breaths, something like that."
Helps with mindfulness at home and with family	"…it helped me do mindful things at my house."
	"I will usually wake up and do the same thing I did yesterday, but (now) I might do something else, talk to someone else."
Reasons why people in the fifth-grade might not use mindfulness skills	
Experiencing difficult emotions	"They just full of anger."
	"Cause in the afternoon they get cranky."
May not like that it is different from regular school activities	"Because… (they) don't like things that are not out classes and they might not like they way everything works in there because they can't have it their way."
May not care about it	"They might just not care."
MindUP program length	
Program should have been longer (in days per week and time in the class)	"It should have lasted longer."
	"Should have been all week."
	"I think if it was like three times a week (that would be) fun too because class is crazy and it is a nice break but I hope that one time it can be longer semester instead of the normal time it stopped."

Likelihood of other fifth-graders wanting to participate in the MindUP program	
Some would want to for extraneous reasons	"Only if they knew about the money first then they would participate."
Reasons they might not want to participate	"Some people might not because go in there because there are some people they might not trust or like."
Concerns if everyone in the fifth-grade participated	If everyone was available to be in the mindfulness program some people might not want to go because (it) might be too crowded…"
Additional information desired from the program	
Practice controlling emotions	"How to control my feelings even though I know I am about to say something that's about to hurt somebody else's feelings."
More techniques for handling difficult interactions	"…Like in the future, you can get two people… And then one of them can get on the other person's nerves and makes you have to think before (they) said something."
Thoughts on mindfulness after completing the MindUP program	
Warmed up to mindfulness	"I think it is very cool and I think it is a fun way to relax without having to solve it by yourself. And it's a fun way to calm yourself down because at first I didn't care about mindfulness."
Remained unchanged	"Never changed."
Thoughts on program instructors/facilitators	
Trustworthy	"Everything you say, she kept it in this program."
	"She kept it in the room."
Open to discuss anything	"They were very open and they would not say something is wrong… they were really open and let us talk about things that were troubling."
Sharing mindfulness skills learned in program with family members	
Shared how mindfulness helped with anger	"About how it helped me with my anger problems."
Shared how mindfulness helped with breathing more	"I told my mom about how it helped my breathe more."

Demonstrated mindfulness methods to family	"I showed her some methods."
How might mindfulness techniques used in the future	
Using mindfulness when frustrated by others	"When I am about to be driven insane by my class because they talk way way way too much."
	"Some of my siblings just get on my nerves almost all of the time."
	"My sibling…"

Table 15

MindUP Fidelity by Session

Lesson Number	Warm-up	Engage	Explore	Reflect	Total Session Fidelity (%)
1: Building the MindUP Learning Community	○	◑	●	●	62.5
2: Understanding the Brain	○	●	●	○	50
3: Learning to Be Mindful	◑	●	●	○	62.5
4: The Brain Break	◑	●	●	●	87.5
5: Mindful Listening	●	●	●	●	100
6: Mindful Seeing	●	●	●	●	100
7: Mindful Smelling	○	●	●	●	75
8: Mindful Tasting	◑	●	●	●	87.5
9: Mindful Touch	●	●	●	○	75
10: Mindful Movement	●	●	●	●	100
11: So Many Feelings!	●	●	●	●	100
12: Building Perspective-Taking and Empathy	○	●	●	○	50
13: Practicing Optimism	◑	●	●	◑	75
14: Savoring Happy Experiences	●	●	●	●	100
15: Practicing Gratitude	●	●	●	●	100
16: Acts of Kindness	●	◑	●	○	62.5
17: Mindful Actions in Our Community	○	●	●	●	75
Totals (%)	61.8	94	100	67.6	80.1

Note. An empty circle (○) indicates section was not introduced by the instructor, a partially filled circle (◑) indicates section was partially introduced by the instructor, a filled circle (●) indicates the section was fully introduced by the instructor

Figure 4

Trajectory of Depressive Symptomology by Group

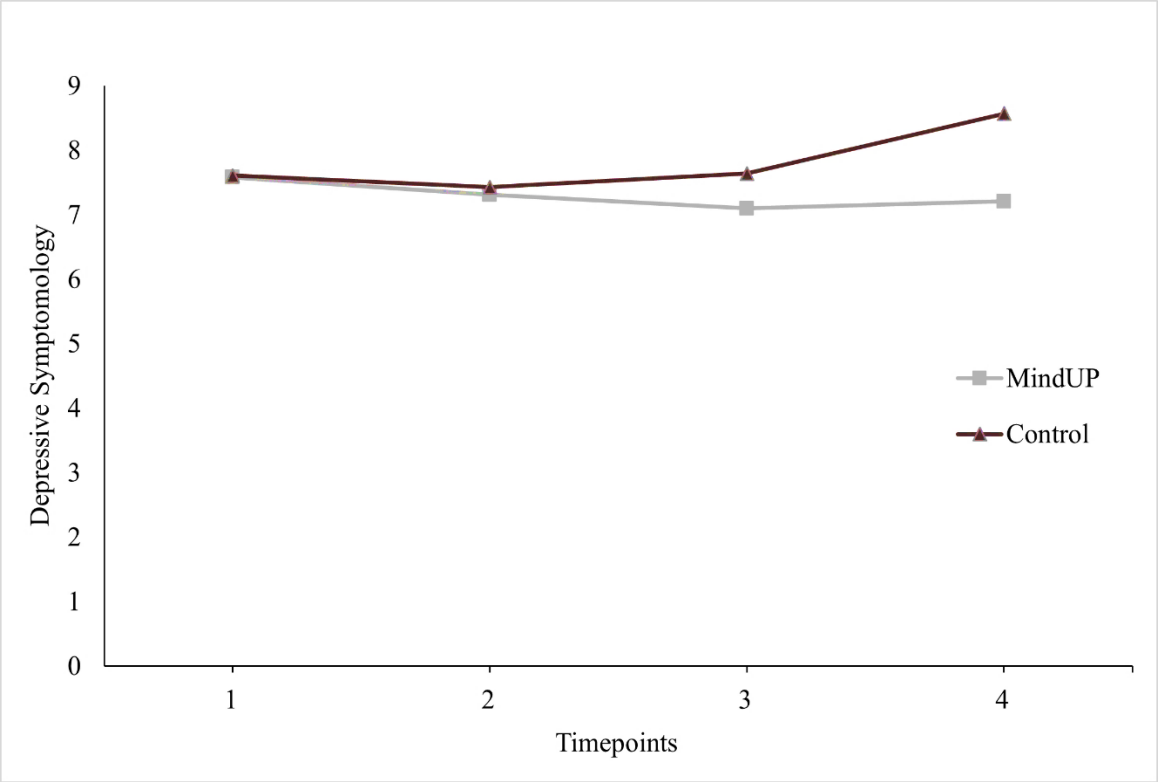


Figure 5

Trajectory of Anxiety Symptomology by Group

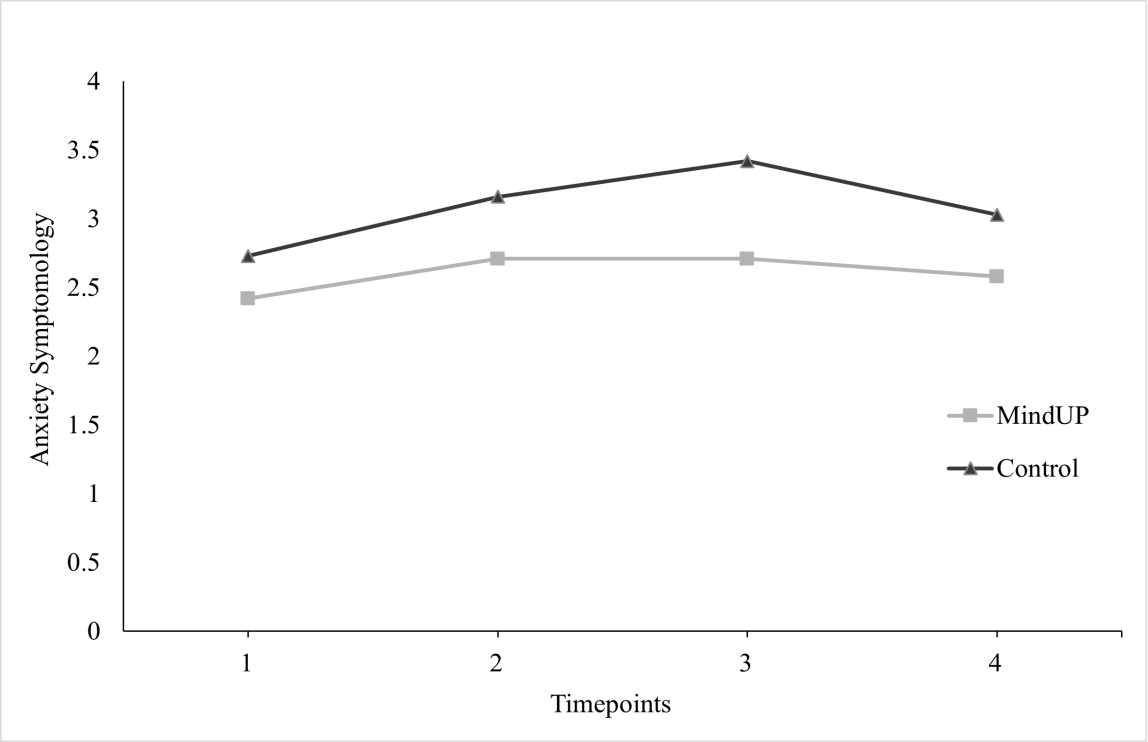
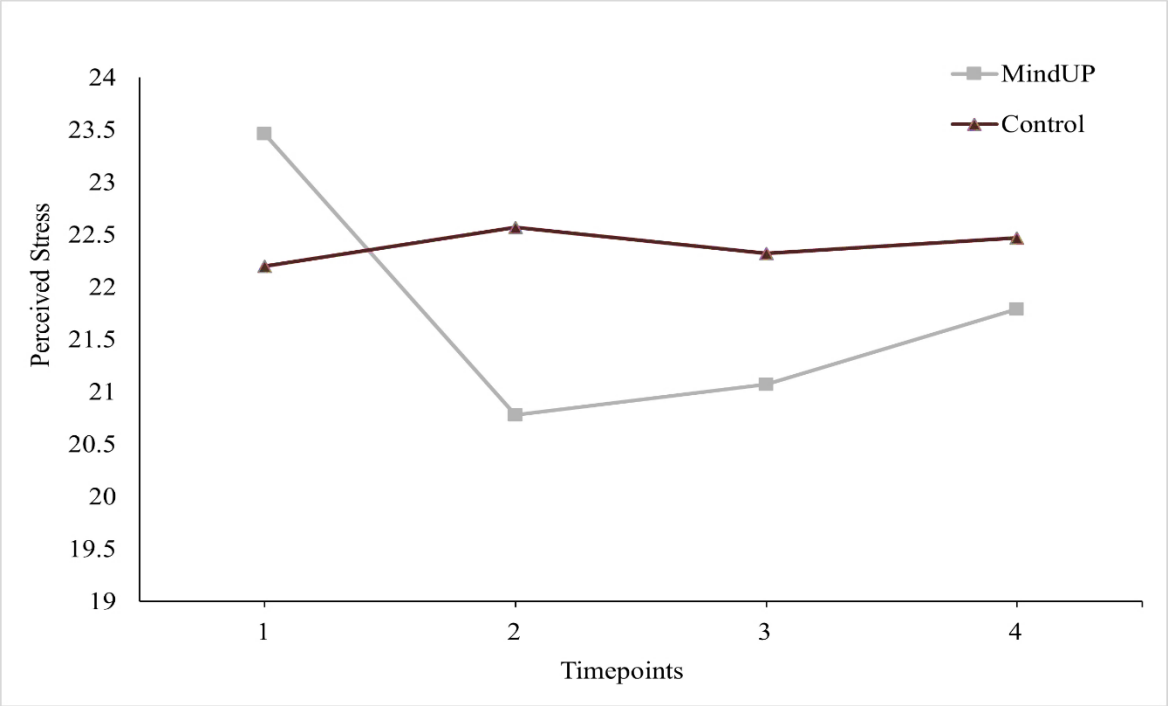


Figure 6

Trajectory of Perceived Stress by Group



APPENDIX A

EXAMPLE LESSON PLAN FROM MINDUP CURRICULUM

Appendix A: Example Lesson Plan from MindUP Curriculum

Lesson 3: Learning to Be Mindful

The purpose of this lesson is to introduce students to the concepts of being mindful and being unmindful as well as relating them to their own experience. Students learn that being mindful means paying attention in the moment without judging and being unmindful means not paying attention to the present moment.

The Lesson Objectives include:

1) Define and differentiate between being mindful and being unmindful.
2) Articulate how experiences in their own lives relate to the concepts of being mindful and unmindful.

The lesson begins with reviewing the community agreement created in the first class which outlines the agreed-upon ways of being together to create a safe, kind, and focused learning community. The teacher then introduces Mindful Awareness through an experiential activity. In this activity, students are instructed to practice focusing on one sense- listening – by closing their eyes and noticing all the sounds they can hear. Students are invited to sit comfortably, close their eyes, or look down at their hands, and listen to the sounds around them in the classroom, the hallway, outside, and in the school. After 30 seconds, students are asked to look up and, without talking, write down the sounds they heard. This activity is repeated two times and students are asked to notice sounds they would usually miss. Students are then asked to reflect on the experience as the teacher records the sounds heard on the board or chart paper. Students then discuss the variety of

sounds and whether they were sounds students don't normally hear. The teacher then helps students make the connection that focusing their attention helped them hear more sounds than they normally do.

The teacher then defines the concepts of mindful awareness and non-judgmental awareness. Mindful awareness and non-judgmental awareness are then further explained in the context of qualities a scientist must have. Students are then paired off with a partner to discuss a time they felt they were being mindful.

The teacher then opens a discussion about the opposite of mindful awareness or being unmindful. Students are instructed to discuss as a group occasions they have been unmindful. To wrap up the lesson, key points of the lesson are summarized, and students are asked to apply their new knowledge about mindful awareness to the MindUP learning agreement. Then, as a class, students will brainstorm ideas and scenarios in which students can practice being mindful in their daily lives. Finally, in their Mindful Me Portfolio (the journal used for the MindUP class), students will create an entry that captures them in a mindful moment. This can be a picture, poem, paragraph, photograph, or another entry.

APPENDIX B

POST-INTERVENTION STUDENT FOCUS GROUP GUIDE

Appendix B: Post-Intervention Student Focus Group Guide

Welcome

Introduction of Interviewer and Notetaker

Introduction

You have been invited to participate in this group discussion because you participated in the MindUP class and the UAB mindfulness study this past year. Thank you for participating in the program. Today, we would like to discuss what you liked about the program, what you didn't like about the program, and what we can do the make the program better. Your feedback and suggestions will help us improve the program for students in the future. Your opinions matter to your school and the researchers at UAB.

What we discuss in this group will be confidential. This means we will do our best to make sure that what you say will not be shared with anyone outside this group. We want to respect everyone's opinions and privacy. We also ask that you do not share what is said within this group with others outside this group meeting.

We will record this session so that researchers from UAB can listen to the recording and help us improve mindfulness education for students at your school. The researchers or the people who listen to the tapes will not share what is said in the focus group with anyone outside of the UAB research team.

My role will be to ask questions and to lead this group as we talk. You are allowed to say "no" and not answer any question you do not want to answer. There are no right or wrong answers, only different points of view. Your participation is totally your choice. You may choose not to participate at any time, and if you choose not to participate you will return to your classroom with your teacher.

Q1: Tell me what you learned during the MindUP program.

Prompts: Which topics/lessons were the most interesting to you? What made these topics/lessons more interesting than others?

Q2: What did you like most about the MindUP program?

Prompts: If you were asked to go through the MindUP program again, what are some of the lessons you would like to do again? What would make you want to have these lessons again?

Q3: What did you dislike about the MindUP program?

Prompts: What are some of the lessons you would not like to do again? Why?

Q4: What are some of the things that were challenging about this program?

Prompts: What helped you overcome these challenges? What would have helped you overcome these challenges?

Q5: How useful were the practices and activities in the MindUP program for you or people in your class (your age)? What are some of the practices and activities in MindUP that did not seem to work for you or people in your class (your age)?

Q6: What are some reasons you or people your age may choose to use the mindfulness skills and practices learned after going through the MindUP program? What are some reasons you or people your age may choose not to use the mindfulness skills and practices learned after going through the MindUP program?

Q7: What did you think about the length of the program?

Prompts: Was it too long, to short, or just right? Why? What did you think about doing the program twice a week? Was twice a week too much, too little, or just right? Why?

Q8: If the MindUP program was available to everyone in your grade, how likely or unlikely do you think people would want to participate?

Prompts: Why do you think your classmates would be likely to participate? What do you think your classmates would be unlikely to participate?

Q9: What other kinds of information would you have wanted from the program that you did not learn?

Prompts: Do you have any ideas for how to include this information in the class for the future?

Q10: What are your thoughts about mindfulness after going through the MindUP program?

Q11: Do you feel like you were able to be open and share with Ms. Kate and Ms. Grace during the program?

Prompts: If so, what made you feel comfortable to share with them? If not, what made it difficult to be open and share?

Q12: Did you share what you learned in the program with parents or family members?

Prompts: What were you most excited to share with them? Did they participate in any of the activities with you?

Q13: Have you used any of the strategies you learned in MindUP in your daily life since the end of the class?

Prompts: How have you used the MindUP strategies at home? How have you used the MindUP strategies at school? How do you see yourself using the information and the skills you learned in the MindUP program in the future?

Q14: Culture is a pattern of behavior shared by a group of people. Many different things make up a society or group of people's culture. These things include food, language, clothing, customs, beliefs, and religion. We are all influenced by culture. Do you think the MindUP program fits with your culture?

Prompt: Is there a way the MindUP program could better fit with your culture?

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Institutional Review Board for Human Use

470
Administration
Building 701 20th
Street South
Birmingham, AL
35294-0104

205.934.3789 | Fax 205.934.1301 |

irb@uab.edu

APPROVAL LETTER

TO: McGinnis, Heather Austin

FROM: University of Alabama at Birmingham Institutional Review Board
Federal wide Assurance # FWA00005960 IORG Registration # IRB00000196 (IRB 01) IORG Registration # IRB00000726 (IRB 02) IORG Registration # IRB00012550 (IRB 03)

DATE: 09-Jun-2022

RE: IRB-300006166

IRB-300006166-016
Culturally Responsive Mindfulness Based instruction for a Birmingham Classroom

The IRB reviewed and approved the Revision/Amendment submitted on 09-Jun-2022 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Type of Review:
Expedited

Expedited Categories: 7
Determination: Approved

Approval Date: 09-Jun-2022

Expiration Date: 02-Apr-2025

Although annual continuing review is not required for this project, the principal investigator is still responsible for (1) obtaining IRB approval for any modifications before implementing those changes except when necessary to eliminate apparent immediate hazards to the subject, and (2) submitting reportable problems to the IRB. Please see the IRB Guidebook for more information on these topics.

The following populations are approved for inclusion in this project: Children- CRL 1

Please note:

Student Name: Melanie Grace Albright

Title of Dissertation: Longitudinal Effects of Mindfulness-Based Interventions on Psychosocial Outcomes in Adolescents from Low Resource Environments

Documents Included in Review:

REVISION/AMENDMENT
EFORM IRB PERSONNEL EFORM