Modification and Evaluation of an Evidence-based, Universal, Mental Health Promotion Program in Title I schools in rural Alabama: Advocates for All Youth (ALLY)

By

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Abstract

In the US, the presence of a lifetime diagnosis of either depression or anxiety rose from 5.4% in 2003 to 8.4% in 2012 in children aged 6-17 years (Bitsko et al., 2018) and by 2016, 16.5% had at least one mental health disorder including depression or anxiety (Whitney & Peterson, 2019). Children and adolescents exposed to adverse childhood experiences (ACE, e.g., parental divorce, maltreatment, trauma, bullying, and family conflict) are more likely to experience chronic stressor states which predispose them to mental health disorders (e.g., anxiety and depression). Suicide is the second most common cause of death among youth with the incidence of suicide increasing with the occurrence of every ACE. Individuals from low socioeconomic status (SES) backgrounds are more likely to experience ACEs. Indeed, many youths from low-SES backgrounds are disproportionately more likely to have higher mental health burdens and are less likely to access mental health care due to poor access (i.e., cost, transportation, and availability of clinicians). Therefore, there is a need for interventions focused on mental health promotion to reduce the incidence and severity of mental disorders in youth, particularly those from low-SES backgrounds. The school is an ideal environment to implement such interventions because students spend most of their time in school, there are reduced barriers to access, and many students can be reached simultaneously. One such intervention, the Advocates for All Youth (ALLY), is a 6-week universal program aimed at reducing anxiety and depression via individualized health coaching targeting 5th and 6th grade students. The aim of this dissertation was to describe the modification and efficacy of this program for use in Title I elementary schools in Alabama with children from rural, low-income, and predominantly Black community.

Study 1 demonstrated the feasibility and described the modifications of the ALLY program aimed at increasing mental and physical health of 5th and 6th grade students in a rural Title I school. Study 2 described the outcomes and efficacy of the modified ALLY program on mental and physical health in 6th graders in three Title I schools using a randomized control design (intervention and waitlist control). Overall, the ALLY program was not associated with improvements in mental and physical health in this population. Future directions and limitations of the ALLY program are discussed. This program of research represents an important first step in determining further modifications that would be necessary to improve mental and physical health in ethnically minoritized middle school students from low SES backgrounds.

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List of Abbreviations

ACE	Adverse Childhood Experience
ALLY	Advocates for All Youth
BMI	Body Mass Index
CBT	Cognitive Behavioral Therapy
ICC	Intraclass Correlation Coefficient
MBSR	Mindfulness-Based Stress Reduction
MBCT	Mindfulness-Based Cognitive Therapy
MI	Motivational Interviewing
PEP	Penn Enhancement Program
PRP	Penn Resiliency Program
PA	Physical Activity
PROMIS	Patient-Reported Outcome Measurement Information System
SES	Socioeconomic Status

Chapter 1 – Introduction

1.1 Section 1: Overview

Adverse childhood experiences (ACEs) and early psychiatric disorders contribute to increasing mental and physical health problems during childhood and adolescence (Kerker et al., 2015; Navalta et al., 2018), particularly for children from low-socioeconomic (SES) backgrounds (Devenish et al., 2017). A recent meta-analysis found that school-based mental health programs effectively reduce anxiety and depression in children ages 11-18 years (Feiss et al., 2019). However, the interventions employed different approaches, program durations, and participant characteristics (Feiss et al., 2019; e.g., targeted vs. universal programs). Therefore, there are still many knowledge gaps regarding the efficacy of school-based mental health programs for children that disproportionately experience ACEs (e.g., those from low-SES backgrounds).

Although health coaching is an established behavioral intervention for behavioral change in children (Olsen & Nesbitt, 2010) and in adults (Hill et al., 2015; Olsen & Nesbitt, 2010), little is known about efficacy of individualized, face-to-face health coaching implemented in school settings (i.e., targeting children or adolescents). Furthermore, school-based health coaching interventions focused on resilience-building have not been extensively explored. To date, the only program of this kind was developed and evaluated recently in Colorado (ALLY; Lee et al., 2021b). This universal program implemented individualized health coaching to increase resilience in middle school students ($N = 287$) and was found to decrease mental health symptoms as well as increase resilience (Lee et al., 2021). However, the population examined was predominantly Caucasian (68%) from middle- to high-SES backgrounds, so it is unclear if this program would be feasible and effective in those from low-SES backgrounds and who are predominantly Black.

Therefore, this study fills the significant gaps in the literature, using a school-based universal program with individualized health coaching for 5th and 6th-grade students in a Title I elementary school in Alabama ($N = 80$). Study 1 describes the modifications to the ALLY program (Lee et al., 2021) for implementation for 5th and 6th graders from a Title I school in rural Alabama (Fall 2021). Interviews with the facilitators and school administrators were conducted to determine feasibility, program perceptions, and barriers to implementation. Study 2 describes the efficacy of the modified ALLY program on mental health (i.e., depression, anxiety), physical health (i.e., physical activity), self-efficacy, and resilience in 6th grade students ($N = 110$) using a randomized design (treatment vs. control) from 3 Title I schools (Spring 2022). Questionnaires were administered the week before and after the 6-week intervention to all participants. Furthermore, this chapter provides a brief introduction to the fundamental concepts that serve as the foundation for the program, specific aims, and hypotheses.

1.2 Section 2: Socioeconomic Status and Mental Health

Globally, the prevalence of mental health disorders in both children and adults has risen (Ghandour et al., 2019). Approximately 16.5% of children in the US between 6 to 18 years old are diagnosed with at least one mental health disorder (Whitney & Peterson, 2019); depression, anxiety, and other behavior problems are the most commonly reported (Ghandour et al., 2019). Suicide is the second leading cause of death in youth. Therefore, the recent rise in prevalence is considered a significant public health concern (Centers for Disease Control and Prevention, 2020; World Health Organization, 2019). Furthermore, suicidal ideation and behaviors have been linked to peer isolation and rejection, emotional neglect, and low socioeconomic status (Wang et al., 2019). This is compounded by social, emotional, and physical factors such as bullying, violence, academic difficulties, and ACEs (Cluver et al., 2015; Khamis, 2015). Moreover, the

relationship between ACEs (e.g., child victimization, poverty, unemployment, parental alcohol or drug problems, parental imprisonment, marital discord, episodes of homelessness, or parental mental illness) and psychiatric disorders in adults and youth has been repeatedly established (Manyema et al., 2018). The risk of suicide attempts is greater in those reporting ACEs (Thompson et al., 2019). Therefore, children who have experienced ACEs have an increased risk of depressive disorders (Chapman et al., 2004) and poor mental health in general (Schilling et al., 2008).

About 17.5% of all U.S. children under 18 years live below the federal poverty line (Abulhul, 2021). ACEs are disproportionately more likely experienced amongst adults (Hampton-Anderson et al., 2021) and adolescents from low socioeconomic status (SES) backgrounds (Devenish et al., 2017; Hurd et al., 2013). Moreover, low SES is considered a chronic stressor that may alter the integrity of the stress response system leading to maladaptive behaviors such as emotional dysregulation, with consequent increased risk of developmental and mental health problems in adulthood (e.g., depression, aggression, and anxiety) (Chapman et al., 2004; Nurius, Green, et al., 2015; Nurius et al., 2013).

1.3 Section 3: The School System

Academic stress is a significant contributor to decreased well-being in students (Choi et al., 2019; McIntyre et al., 2018). It is also particularly negatively related to resilience (Wilks & Spivey, 2010). Furthermore, school system pressures (e.g., tests and exams), financial problems, academic competitions, interaction with teachers, peer pressure, and parental high expressed emotion lead to elevated academic stress (Hosseinkhani et al., 2020). Additionally, children from low-SES backgrounds may experience elevated academic stress because of lower academic achievement (Alexander & Jang, 2020). Furthermore, lower academic success is observed in

schools in low-SES communities (Noguera, 2009). Therefore, there is a need for programs that enhance academic success, reduce academic stress, and attenuate the risk for poor mental health, particularly for children from low-SES communities.

With recent school closures due to the COVID-19 global pandemic, there is likely to be an increase in poor nutrition in children who rely on school lunches (Hoffman & Miller, 2020), a lack of protection from at home maltreatment (i.e., physical, sexual, and psychological abuse), and increase in exposure to violence (Chandra; Hoffman & Miller, 2020). Additionally, there may be reduced opportunities for mental health services (Hoffman & Miller, 2020). Further, all children, not just those at greatest risk, have reported elevated mental health issues due to COVID-19 (Galea et al., 2020). As the education systems transition back to in-person delivery, schools can play a pivotal role in reducing the unmet mental and physical health needs experienced by youth through greater opportunities for care and interventions (Ryan & Warner, 2012). Programs delivered in the school provide a cost-effective means to enable all students to access mental health services (Ali et al., 2019; Feiss et al., 2019). Indeed, youth from low- SES families and youth without public health insurance are unjustifiably more likely to receive mental health services entirely in school settings (Ali et al., 2019; Ryan & Warner, 2012). Therefore, the present study will evaluate the efficacy of a school-based individualized health coaching program to address mental health service gaps and reduce the mental health burden in low-SES children.

1.4 Section 4: Common School-Based Interventions for Psychological Outcomes

1.4.1. Cognitive-Behavioral Therapy-Based (CBT) Interventions

Research suggests that CBT delivered within the elementary school setting may be beneficial for treating anxiety (Chiu et al., 2013) and depressive disorders in children and

adolescents (Shirk et al., 2009). An example is the Creating Opportunities for Personal Empowerment (COPE) program, a manualized health promotion intervention based on CBT principles and comprised of a 15-session educational and cognitive-behavioral skills-building program with physical activity as a component of each session. Positive results have been reported for COPE participants compared to active controls regarding better mental health and Body Mass Index (BMI) following the program (Melnyk et al., 2013).

1.4.2. Mindfulness

Meta-analyses have indicated improvements in resilience and other psychological outcomes with moderate effect sizes from school-based mindfulness interventions (Zenner et al., 2014; Zoogman et al., 2015). Furthermore, a study showed that school mindfulness-based interventions (MBIs) could bridge the mental health disparity gap at reduced costs for adolescents (Sapthiang et al., 2019). Additionally, mindfulness can be an effective approach to building resilience through improvements in physical activity (Salmoirago-Blotcher et al., 2018), emotional wellbeing (Galla, 2016), optimism, and competent social behaviors (Schonert-Reichl & Lawlor, 2010) in 5-10 sessions. However, one of the limitations of mindfulness-based interventions is the need to ensure that mindfulness instructors can deliver the content appropriately to children and adolescents (Sapthiang et al., 2019).

1.4.3. Physical activity

A literature review examining the relationship between physical activity and mental health in children and adolescents showed that physical activity interventions have minor but beneficial effects on reducing anxiety and depression (Biddle & Asare, 2011). The review also showed consistent negative associations between mental health and sedentary behavior (Biddle & Asare, 2011). Furthermore, a systematic review of school-based physical activity interventions

that included 30 studies found that incorporating active breaks during the school day and environmental changes can promote physical activity and decrease sedentary behavior (Andermo et al., 2020). Moreover, results showed that these school-based physical activity interventions might reduce anxiety, increase resilience, increase positive mental health, and improve well-being in children and adolescents with moderate effect sizes. Limitations of the study include the authors' decision to exclude studies that included broader aspects of positive mental health and internalizing mental health symptoms. This could have led them to miss important findings. Further, included studies were mixed quality, and several were underpowered. (Andermo et al., 2020).

1.4.4. Yoga

Yoga practices are intended to develop a balance between the physiological system (i.e., respiration, endocrine, digestive) and nervous system, and promote a strong, extensible, pain-free body and a stable, calm, and clear mind (Kaley-Isley et al., 2010). Additionally, yoga aims to facilitate self-transformation to improve quality of life (Kaley-Isley et al., 2010). Research supports the benefits of yoga in children and adolescents when used as a therapeutic intervention for mental health problems (Butzer et al., 2016; Kaley-Isley et al., 2010; Sarkissian et al., 2018). Furthermore, yoga increased resilience and reduce stress in a study with thirty students from 3 urban low-SES schools in California (Sarkissian et al., 2018). Specifically, students in the intervention group significantly reduced stress and improved positive affect and resilience. In this study, the students had yoga about twice a week for 10 weeks during a 50-minute physical education period or after school. However, one of the constraints of the study was the cost. Hence 2 of the schools could only administer yoga once a week (Sarkissian et al., 2018).

1.4.5. Program Type: Targeted vs. Universal Approaches

Various school-based interventions have been utilized to improve mental health and resilience (Andermo et al., 2020; Sabin et al., 2021; Sarkissian et al., 2018; Zoogman et al., 2015). Many school-based health promotion programs are targeted programs (Henry et al., 2020; Singhal et al., 2014; Terry et al., 2021) that provide services to children and adolescents identified with behavioral and mental health symptoms in schools (at-risk students). For example, a randomized controlled trial used a motivational interviewing-based mentoring program for at-risk predominantly African American children (N = 39 ;77.8% African American; Henry et al., 2020). The intervention was administered to students placed at an alternative site (a location outside of school though still considered a part of the school) who were referred to the site because they had behavioral concerns (e.g., disruptive behavior) or were at risk of dropping out. The intervention was delivered for 30 minutes weekly over 10-12 weeks (~360 minutes). Results showed that participants in the MI group had significant decreases in problematic behaviors compared to waitlist controls with large effect sizes (Henry et al., 2020).

However, the challenge with using the targeted approach is the likelihood of missing sub-clinical mental health symptoms. Universal programs can reach more individuals simultaneously and prevent the stigma associated with targeted programs. Additionally, with the increase in the prevalence of mental health disorders in children and adolescents, universal health promotion programs may effectively provide services before children reach clinical levels. Further, even though more studies are adopting universal approaches (Gillham et al., 2006; Hoying et al., 2016; Lee et al., 2021; Sabin et al., 2021), few of these studies (Hoying & Melnyk, 2016; Nash, 2007) address participants in middle school (5th and 6th grade) and students from predominantly low socioeconomic status backgrounds. Moreover, psychological disorders in children and

adolescents are escalating. The presence of a lifetime diagnosis of either depression or anxiety rose from 5.4% in 2003 to 8.4% in 2012 in children aged 6-17 years (Bitsko et al., 2018). By 2016, 16.5% had at least one mental health disorder including depression or anxiety (Whitney & Peterson, 2019). Therefore, programs that start earlier (e.g., 5th- 6th grade) may help mitigate this public mental health challenge and reduce the likelihood of conversion of subclinical cases during adolescence.

In addition to poor academic outcomes, elevated rates of obesity, anxiety, and depressive symptoms have been recently reported in older adolescents from low-SES and rural communities in Alabama (Feiss & Pangelinan, 2021). Moreover, a bidirectional relationship between academic and mental health functioning exists such that changes in one sphere prognosticates changes in the other (Suldo et al., 2014). Therefore, additional research is needed to identify programs that enhance healthy behaviors and build resilience, which may correspondingly improve academic success in those at greatest risk (i.e., those from low-SES backgrounds) before the onset of mental health problems (i.e., during childhood).

1.4.6. Section Summary

Taken together, there are several remaining knowledge gaps regarding the implementation and efficacy of school-based programs to reduce mental health problems in children and adolescents. Although several program types are presented, widespread implementation is problematic. For example, with yoga, there is the issue of cost (Sarkissian et al., 2018) that would prevent its implementation and sustainability in a rural low-SES school. Similarly, CBT is usually administered by trained professionals or teachers (Hoying et al., 2016), making it an expensive option that may not be sustainable for this population. Mindfulness needs to be appropriately delivered culturally- and educationally (Sapthiang et al., 2019); it may not be

an appropriate program for children with limited previous exposure to mindfulness practices. Finally, although physical activity programs have the potential for the greatest improvements in mental health (and physical health) outcomes (Andermo et al., 2020), these programs need to be consistent and supported by changes in the child's home and community environment to be sustained and effective (Ding et al., 2011; Roemmich et al., 2007). These program implementation issues (i.e., cost, sustainability, delivery process challenges, and appropriateness for the target population) need can be addressed by the future programs.

To this end, the present research program determined how to implement the ALLY program for use in rural, Title I schools. The ALLY program (Lee et al., 2021) is a universal program aimed at reaching all youth between the ages of 9-13 years to increase resilience, self-efficacy, and reduce symptoms of anxiety and depression. In addition, the ALLY program promotes health literacy, physical activity, adequate sleep, reduced screen time, and good nutrition. The ALLY program is a cost-effective 6-week, thirty-minute per week intervention for 5th and 6th grade students implemented by facilitators who receive a 6–8-week training. The facilitators are community members and undergraduate students trained by experts (for detail regarding ALLY facilitator training see Table 1). The ALLY program combines principles of MI, CBT, and mindfulness. Importantly, research supports the combination of evidenced-based strategies for school-based interventions (Domitrovich et al., 2010) implemented in the ALLY program. Furthermore, the population targeted through this study (predominantly black, low-SES) is at elevated risk for mental and physical health disparities and academic stress. Still, it does not currently have access to universal programs or interventions to reduce these burdens.

1.5 Section 5: Specific Aims and Hypothesis

This study filled some significant gaps in the literature, using a school-based universal program with individualized health coaching for 5th and 6th-grade students (ALLY program) in a Title I elementary school in Alabama ($N = 80$). Study 1 describes the modifications to the ALLY program (Lee et al., 2021) for implementation for 5th and 6th graders from Title I schools in rural Alabama (Fall 2021). For study 1, we hypothesized that feasibility, acceptability, barriers. and sustainability issues will be identified, and modifications made. Qualitative analysis of interviews with the facilitators and school administrators were conducted to determine feasibility, program perceptions, and barriers to implementation. Compared to previous studies using the ALLY program (Lee et al., 2021), low health literacy contributed to the need to modify the program for implementation and program dissemination to students, parents, and teachers/administrators. Modifications to the questionnaires (e.g., reducing the number), facilitator manual (e.g., simplifying language, providing examples/clarifications), and student workbook were needed. In addition, enhanced communication with school administrators, teachers, and parents (e.g., via one-on-one meetings and group lunch meetings) were needed to reinforce key concepts and provide a supportive intervention environment.

To measure the efficacy of the modified ALLY program, Study 2 measured changes in resilience and self-efficacy, mental health (i.e., depression, anxiety), and physical health (i.e., physical activity) in 110 6th grade students using a randomized design (treatment vs. control). Linear mixed-effects regression was used to calculate random effects of students nested within the ALLY facilitator and Time (pre-and post-test) nested within students. Time (within-subjects factor) and Group (between-subject factor) was used to examine differences from pre-test to post-test comparing the ALLY and control groups. Follow-up post-hoc tests were conducted to

decompose significant main effects and interactions. The alpha level was set at $p < .05$. Analyses were completed using R (4.1.3) and R-Studio (version 4.1.1.21).

Study 2 - Specific Aim 1: To determine if the one-on-one ALLY program leads to greater resilience and self-efficacy.

Hypothesis 1: Greater levels of resilience and self-efficacy will be reported by students who receive the one-on-one ALLY program compared to the control group as measured by the Child and Youth Resilience Measure (CYRM-R; Jefferies et al., 2019) and the Self-Efficacy Questionnaire for Children, respectively (SEQC; Muris, 2001).

Specific Aim 2: To determine if the one-on-one ALLY program leads to reduced depression and anxiety (mental health dependent variables).

Hypothesis 2: Lower levels of depression and anxiety will be reported by students who receive the one-on-one ALLY program compared to the control group as measured by the PROMIS depression and anxiety scale (Irwin et al., 2010)

Specific Aim 3: To determine if the one-on-one ALLY program intervention leads to greater physical activity levels (physical health dependent variable).

Hypothesis 3: The one-on-one ALLY program will lead to greater physical activity compared to the control group as measured by the 8-item PROMIS Physical Activity Survey (Tucker et al., 2014).

Specific Aim 4: To determine if the effect of the one-on-one ALLY program on mental health (depression and anxiety) is mediated by resilience and self-efficacy (independent variables).

Hypothesis 4: Resilience and self-efficacy positively mediates the relationship between the one-on-one ALLY program and mental health as measured by the Child and Youth

Resilience Measure (CYRM-R; Jefferies et al., 2019) and the Self-Efficacy Questionnaire for Children, respectively (SEQC; Muris, 2001).

1.6 Section 6: Limitations/Delimitations

Many of the limitations or challenges of the present study were due to implementation of the ALLY program in Title I schools with the target population. First, many students in Title I schools in rural Alabama have low reading and mathematics levels (https://reportcard.alsde.edu/SelectSchool.aspx). As a result, they found the questionnaires difficult to understand, especially when administered via tablet in a group format without support (as per the protocol for the ALLY program). To resolve this, we administered each questionnaire in paper format, with each questionnaire administered one-on-one by the same facilitators. Therefore, all the students were adequately supported while filling out the questionnaires to improve the validity and accuracy of their responses. In addition, participants' low reading and health literacy necessitated adjustments to the ALLY student workbook and facilitator manual to improve the understanding and engagement of the students in the intervention. These details are provided in Study 1.

Second, the facilitators had a limited background in implementing mental health programming (e.g., they were undergrads from health-related fields but had little field/clinical experience). To this end, additional training was provided beyond the protocol for the ALLY program (i.e., 28.5 hours vs. 22 hours). Moreover, changes were made to the ALLY facilitator guide including providing specific examples of each key concept, a description of the goals of each session/activity, and additional interactive activities to reinforce key concepts to improve the delivery of the intervention (see Study 1). Another challenge was the issue of cultural competence. The majority of the facilitators were Caucasian undergraduates from predominantly

high-SES backgrounds. The use of culturally sensitive practices has been shown to increase the effectiveness of health promotion programs (Griner & Smith, 2006). To ensure cultural sensitivity, facilitators had extensive training on cultural competence both before and during the intervention (see details regarding ALLY facilitator training) and supervision and feedback from an experienced research coordinator.

Additionally, there was limited private space available to administer the ALLY sessions in the Title I schools. Private spaces were needed to encourage therapeutic alliance, trust, and confidentiality. To address this challenge, whatever space was available was organized such that the facilitators were sufficiently spaced out to ensure privacy and avoid distractions. Additionally, sessions were scheduled at different times to ensure fewer sessions occurred simultaneously.

Furthermore, previous studies of interventions to improve resilience encounter low participation rate (Gillham et al., 2006). This issue was mitigated by using an opt-out approach to increase the participation rate (Lee et al., 2021). Mindfulness-based interventions require that the instructors impart an experiential understanding of this ancient technique (Sapthiang et al., 2019). Given the low previous experience with mindfulness, modified versions of mindfulness materials were adopted in which simplified language, concrete examples, and specific activities were implemented.

In summary, this chapter gave a brief overview of basic concepts in this dissertation including the epidemiology of psychiatric disorders in children and adolescents, the prevalence of ACEs, the link to suicide and academic outcomes, and the relationship between SES and ACEs. The chapter also described how ACEs predispose children and youth from low SES backgrounds to mental health disorders. In addition, this chapter highlighted school stressors, the

strengths of school-based interventions, and the types and efficacy of different school-based interventions utilized in middle schools. Lastly, the chapter described the specific aims and hypotheses that the study aimed to address, its limitations, and delimitations.

Chapter 2 – Literature Review

This chapter describes the theories and empirical evidence that provide a framework for the in-school, universal design health coaching (ALLY) program and hypotheses for this dissertation. The concepts of health coaching, resilience, and universal programs are described with examples of studies that have implemented these methods. Additionally, the components of the ALLY intervention are described in detail.

2.1 Section 1: Health Coaching

Health coaching can serve as one method for delivering patient-centered behavioral change programs. Health coaching involves an active learning process based on principles of motivational interviewing to identify patient-determined goals and promote self-discovery (Wolever et al., 2013). It also encompasses accountability for behaviors and education through the health coaching processes (Wolever et al., 2013). Health coaching is founded on several theories such as the Transtheoretical Model of Change, the Information-Motivation- Behavioral-Skills Model, the Theory of Planned Behavior, Social Cognitive Theory (SCT), Self Determination Theory (SDT), and Social Learning Theory (SLT) (Davis et al., 2015). Notably, health coaching incorporates SDT concepts of autonomy, competence, relatedness, and self-integration, which are consistent with increasing motivation, building resilience, and achieving goals (Denneson et al., 2020). The role of a health coach is to reinforce, support, and promote clients' goal achievement (Wolever & Eisenberg, 2011).

The effects of health coaching on behavioral changes for physical health (e.g., weight loss) have been evaluated in children (Paineau et al., 2008; Rice et al., 2008) and adults (Schuessler et al., 2007). For example, an integrative review indicated the positive effects of health coaching on behavior change for children and adults with physical health problems (e.g.,

obesity and hypertension; Olsen & Nesbitt, 2010). Furthermore, a qualitative study on eighteen obese urban adolescents (N = 12 females) in a weight management program found that most girls wanted to improve their physical features through weight loss (Alm et al., 2008). The facilitators in the program were graduate students in public health or psychology who were trained in motivational interviewing. Ten of the study participants received both the coaching intervention and standard care and 8 received the standard care only. Coaching intervention involved one-on-one semi-structured interviews via weekly motivational phone calls lasting 15-30 minutes in addition to the standard weight management. The average length of participation in the health coaching intervention was 5 months (ranging from 3 to 9 months). In addition, the facilitators provided support that helped the participants feel more successful in goal setting. As a result, five participants in the intervention group and three participants in the standard care group successfully changed their behaviors and met the intervention goals (Alm et al., 2008). Additionally, Rice et al. (2008) conducted a 12-month intervention for youth aged 7-17 years old, including exercise, nutrition coaching, and health coaching for overweight children (N = 12). Participants attended 60-min sessions, three times per week during a core 3-month phase. Subsequently, participants had weekly exercise session with the coach during a 3-month transition phase. Finally, sessions decreased to once a month during the 6-month maintenance phase. All through the 12 months, nutrition and counseling remained available. Results showed that 68% of participants lowered their BMI. In addition, there were improvements in fitness assessment measures even in those who did not have lower BMI (Rice et al., 2008).

Further, Paineau et al. (2008) conducted a randomized controlled trial study to assess whether nutritional intake and weight control would improve in children and parents participating in a family dietary coaching program (N = 1013). Participants were randomized into

3 groups. The first group (n = 297 families) received coaching from dietitians on increasing carbohydrate intake and reducing fat intake, the second group (n = 298 families) received advice on increasing carbohydrate intake, reducing fat and sugars. The last group was the control group (n = 418 families) which received general nutrition information but no one-on-one advice. The intervention comprised monthly phone counseling and Internet-based monitoring over 8 months for both intervention groups. While the control group's parents increased BMI, the treatment group decreased BMI throughout the intervention (i.e., over 32weeks). In the children, there were no significant differences between groups for BMI during the intervention and anthropometric measures increased for the 3 groups as expected in growing children. However, there was a reduction in calorie intake among parents and children in both groups compared to the control group though the difference was significant for parents in the 2nd intervention group (Paineau et al., 2008). Taken together, health coaching is effective in supporting goal setting to improve physical health and promote weight loss in children and adults.

Far fewer studies have examined health coaching to address mental health. For example, Sabin et al. (2021) conducted a universal and individualized health coaching intervention to build resilience and reduce anxiety symptoms (6 weeks/15-minute sessions) in 285 sixth graders (68% Caucasian, 18% Hispanic, 4% Black). Significant moderate effect sizes were observed for resilience, self-efficacy, and anxiety symptoms (Sabin et al., 2021). Lee et al. (2021) conducted a similar individualized and universal health coaching intervention with 6th graders (N = 287; 68% Caucasian, 18% Hispanic, 4% Black). Participants reported high levels of self-efficacy, grit, and resilience. However, small effect sizes were observed for resilience.

These studies establish the utility of health coaching for children and adolescents for physical and mental health outcomes. Evaluation of these programs include qualitative analysis

(Alm et al., 2008) or quantitative assessment of single-group pre-post designs (Rice et al., 2008; Sabin et al., 2021). There was only one randomized controlled trial, but this study focused on families and not just child outcomes (Paineau et al., 2008). Moreover, only a few studies use health coaching to improve mental health challenges in children (Gillham et al., 2007; Kuperminc et al., 2020; Lee et al., 2021; Sabin et al., 2021). Therefore, there is a need for high-quality studies (i.e., RCTs) to evaluate the effects of health coaching on physical and mental health in youth.

2.2 Section 2: Resilience

Resilience is a progressive and adaptive process that encompasses maintaining, or swiftly regaining equilibrium in stressful conditions (Davydov et al., 2010). Sustainability is a related concept that describes the continued experience of positive emotional, psychological, and social wellbeing when exposed to stress or trauma (Rutten et al., 2013). Sustainability is related to high life satisfaction, self-determination, independence, self-acceptance, positive interpersonal relationships, and active community participation in the presence of pain (Goubert & Trompetter, 2017). Resilience is the capacity to recover from adversity that may be prevented or alleviated with sustainable practices (Goubert & Trompetter, 2017). Following exposure to severe adversity, sustainability mitigates the impact on mental health and wellbeing (Davydov et al., 2010). The relevant frameworks associated with resilience and sustainability include SDT, which examines the motivational antecedents of resilience (Mahoney et al., 2014). The biopsychosocial model of resilience assumes that individuals have access to both internal and external mechanisms to withstand psychological problems. Specifically, internal mechanisms help recognize and overcome adversities and related effects (Davydov et al., 2010; Prout et al., 2019),

while external mechanisms involve the interplay of environmental and social constructs (Prout et al., 2019; Türk-Kurtça & Kocatürk, 2020).

With respect to empirical evidence in pediatric populations, a year-long group mentoring program to improve resilience was conducted in 9th-grade students (N = 114) at risk for school dropout (Kuperminc et al., 2020). Groups consisted of 6-8 students and two co-mentors who lead weekly 50-minute sessions (1750 minutes total). The comparison group included seventy-one 9th grade students who received an ethnic course or summer orientation program. The interventionists were volunteers such as community members and school staff (e.g., principal, counselors, and other staff members) who received a 4-hour training before the intervention. The population was largely low-income, with 61% Hispanics and 11% African Americans. Students reported higher resiliency in most external facets of resiliency and 1 of 4 measures of internal resiliency (Kuperminc et al., 2020). Despite these promising findings and similar characteristics with the population of interest (at risk for drop out), there are several notable limitations: 1) the program did not follow a specific structure, so fidelity could not be guaranteed; 2) the design was without random assignment; 3) there was no information regarding session attendance. Further, there were only 9th grade students and few African Americans. Therefore, the results may not generalize to the population of interest.

The following study addressed most of the limitations of the previous study. Gilham et al. (2007) conducted a randomized controlled trial focused on resilience to reduce depressive symptoms in children and their parents from 3 middle schools. Thirteen families opted out of the study. The majority of the population was Caucasian (75%), N = 697, mean age = 12.13 years. Thirty-nine percent of the students were in 6th grade, 34% in 7th, and 27% in 8th grade. The authors used stratified sampling within schools and groups based on baseline Children's

Depression Inventory (CDI score), gender, and grade. Afterwards, the authors randomized using computer generated random numbers to assign participants to one of the three groups: Penn Enhancement Program (Shatte, 1996), Penn Resiliency Program (Gillham et al., 1990), or Control. The first intervention group (Penn Resiliency Program (PRP); $n = 232$) focused on cognitive-behavioral principles. The second intervention group (Penn Enhancement Program (PEP); $n = 231$) focused on stressors associated with adolescent depression. The control group recieved no intervention (CON; $n = 234$). The treatment groups had twelve 90-minute sessions (1080 minutes).

Interventionists were school counselors, teachers, and graduate students in clinical, school or education psychology. The interventionists received a 30- hour training and had group supervisions with the intervention developers. In terms of fidelity, sessions were audio recorded, and two research assistants assessed randomly selected lessons for alignment to the intervention protocol using an objective scale. There were no significant differences in effects on depression between the PRP and control or PEP. Still, students in the PRP group in 2 of the schools had a significant reduction in depressive symptoms compared to PEP and controls with moderate effect sizes and effects sustained over a 30-month follow up period. However, in the 3rd school, PRP was not effective. Authors ascribe smaller PRP effects to interventionists who are not part of the intervention development team. In other words, issues with implementation and dissemination (Gillham et al., 2007). Despite positive results, the sample lacked diversity (only 9% African Americans) so results cannot generalize to the population of interest. Further, the study focused only on depression.

Programs focused on resilience are also associated with increased self-efficacy and decreased anxiety and depression (Lee et al., 2021; Sabin et al., 2021). Using a community-based

survey on 2,508 participants (age 14-92 years), Beutel et al. (2017) showed that adverse childhood experiences are associated with low resilience, self-efficacy, and helplessness. Results also showed that individuals with a history of adverse childhood experiences who develop resilience and coping skills are less likely to have mental health issues across the lifespan (Beutel et al., 2017). Additionally, according to a large longitudinal adult twin study ($N = 7463$), resilience is inversely related to levels of anxiety and depression. Thus, programs that increase resilience may protect against stressful conditions that increase depression and anxiety (Sheerin et al., 2018). Furthermore, Hjemdal et al. (2011) showed that high levels of resilience might reduce the likelihood of developing mental health problems such as anxiety, depression, and obsessive-compulsive disorder in a study on 307 adolescents (Hjemdal et al., 2011). Moreover, interventions focused on resilience and improving mental health significantly impact students' ability to manage daily stressors leading to improvements in educational outcomes for students at risk of failure (Fenwick-Smith et al., 2018; Waxman et al., 2003). Therefore, school-based programs aimed at increasing resilience may be particularly beneficial for children at elevated risk for stress, trauma, adversity, or academic problems (e.g., children from low-SES backgrounds).

2.3 Section 3: Universal Programs

Universal programs address sub-clinical cases and are administered to all students (Chaplin et al., 2006; Nash, 2007; Sabin et al., 2021). In contrast, targeted programs are health promotion programs for students identified with mental health or that exhibit problem behaviors (e.g., disruptive behaviors or at risk of dropping out; Henry et al., 2020; Terry et al., 2021). Universal programs may be the most appropriate for Title I schools in rural Alabama. Furthermore, Title I schools have a high percentage of students who qualify for free lunch and

those from low SES backgrounds. Based on the established theories linking low SES with suicidal ideation and mental health (Chapman et al., 2004; Nurius, Prince, et al., 2015), universal programs are supported for students from Title I schools who are at elevated risk for subsequent mental health disorders. Many of these students are from low SES backgrounds are more likely to access mental health services entirely from school (Ali et al., 2019) and may not be able to afford professional mental health care (Ryan & Warner, 2012).

Studies have examined the impact of universal in-school mental health programs on pediatric populations. For example, Nash et al. (2007) implemented a 9-week intervention (Empower) for middle school students (sixth- through eighth grade) using peer education and support. The participants were randomly assigned to intervention and comparison groups. The participants in the intervention group (n = 21) had weekly 45-minute sessions, with 6 to 8 children in each of three groups. Also, the intervention group had the Empower program and usual school services. Nineteen students received only usual school services and served as a comparison group. The schools included were in a community in the southwestern United States with 46.3% African Americans students/schools. No significant differences were observed between the intervention and comparison group. The authors attributed the insignificant result to lack of trust since building trust may take more time than the 9 weeks of the intervention (Nash, 2007).

Evidence suggests that the composition of groups in universal designs affects program outcomes. For example, one randomized controlled design compared a mixed male and female Penn Resiliency Program (PRP) group, an all-female PRP group, and a control group in a depression-focused intervention in 6th - 8thgrade students. Boys were randomized to the mixed group or control group (N = 208; aged 11 to 14 years; Chaplin et al., 2006). The intervention

comprised twelve 90-min weekly sessions (1080 minutes) after school in groups of 9 to 14. The population was largely Caucasian (88%). The all-female group was more effective than the mixed group in reducing hopelessness, and the participation rate was better for the all-female group. However, there was no difference between the all-female group and the mixed group regarding depressive symptoms. Both the all-female group and the mixed group were similar in reducing depressive symptoms, although the all-female group was better than the mixed group in reducing hopelessness (Chaplin et al., 2006). A limitation of this study was that adolescents from low SES backgrounds were more likely to drop out of the study than the Caucasian youth, limiting the generalizability of these study results to the population of interest.

Considering the lack of significant results and the inability to generalize the results of the previous studies in this section, further exploration was needed to ascertain the state of the literature on universal programs. Another study examined the efficacy of a universal, single group pre-test and post-test design using the COPE Healthy Lifestyles TEEN 15-session program (900 minutes) in 8th-grade students (N = 102; 13-14 years) enrolled in a required health education class (Hoying et al., 2016). The population was comprised 100% Caucasian high school students from a rural underserved area in the Midwest with almost 50% of students receiving public assistance (from low SES backgrounds). Health teachers received an 8-hour of training before delivering the intervention. Improvements in disruptive behavior, anxiety, and depression were observed. However, the intervention fidelity was compromised (i.e., there was a decrease in teacher intervention fidelity on at least one occasion during the intervention) and corrective action was required. Although this study showed positive results of a universal health coaching intervention, in a low SES population, the age group does not fully capture the age of

participants in the population of interest (11-13 years). Further, this study's internal and external validity was compromised due to a lack of racial diversity and control group.

The following study addresses the lack of racial diversity and age limitation of the previous study. Hoying & Melnyk. (2016) examined the efficacy of the COPE Healthy Lifestyles TEEN program in 6th grade urban middle school students (N = 31; aged 11-13 years) using a single group pre-test and post-test design (Hoying & Melnyk, 2016). The intervention lasted 15 weeks (900 minutes) and aimed to increase healthy lifestyle beliefs, physical activity, and self-concept and reduce suicide risk, anxiety, and depression. The population was low-SES and 58% African American. Participants reported a significant anxiety reduction, increased healthy lifestyle beliefs, and physical activity with moderate to large effect sizes. Further, at baseline, students with elevated anxiety, depression, suicide risk, and low self-concept reported significant increases in self-concept and decreased anxiety, depression, and suicidal ideation. Despite these promising results and potential generalizability to the population of interest for the present research program, additional high-quality studies (i.e., RCTs) with larger sample size are needed to confirm these results.

The following study addresses the sample size limitation in the previous study. Sabin et al. (2021) examined the efficacy of a one-group pre-post design universal health coaching intervention to reduce negative affectivity and build resilience in 11- to 12- year-old middle school students (N = 285). The population was majorly Caucasian (68%) and 16% of the population may have been from low SES backgrounds (i.e., qualified for free or reduced school lunch). Facilitators were certified by accredited programs (i.e., either a master's degree in health promotion or certification by International Coach Federation accreditation or an accredited coaching program with National Commission for Certifying Agencies). They led the intervention

for 15 minutes weekly for 6 weeks (90 minutes total). Participants who had high levels of affective negativity at baseline had significant improvements in self-efficacy and anxiety symptoms with moderate effect sizes. In addition, all participants had significant improvements in resilience and self-efficacy. Although these study results are promising, the study's internal and external validity is compromised due to a lack of racial diversity and control group.

In summary, universal programs reach more students simultaneously and help mitigate the rising prevalence of mental health disorders particularly for sub-clinical cases or those at greatest risk for future mental health problems (e.g., those from low-income or underserved communities). However, high-quality studies, those with greater racial diversity, and studies with large samples are needed to validate results.

2.4 Section 4: Components of the ALLY Intervention

Advocates for All Youth (ALLY) is a 6-week (30 minutes per week) school-based universal, one-on-one health coaching program to increase resilience and self-efficacy and improve mental and physical health outcomes. This section describes the rationale for including the following additional components in the ALLY curriculum: mindfulness, cognitive-behavioral therapy, and motivational interviewing.

2.4.1. Mindfulness

Mindfulness is a meditation style that originated from Buddhist practices (Baer, 2003; Siegel et al., 2009). It can be defined as a process of immersing a full, explicit, and active awareness of an experience characterized by a psycho-spiritual facet and sustained from one moment to the next (Van Gordon et al., 2015). Mindfulness aims to develop skills and techniques to experience events from an accepting and de-centered perspective rather than a self-identification or an avoiding stance (Coffman et al., 2006). A de-centered stance implies

observing personal experiences without reacting emotionally (Coffman et al., 2006). Furthermore, body sensations, feelings, and thoughts are approached without judgment as events that do not reflect oneself (Coffman et al., 2006). Mindfulness encourages observation and releasing of thoughts and emotions that are usually avoided intentionally to help create a position of recognizing and breaking thought cycles that could lead to anxiety and depression (Coffman et al., 2006). Neurobiological and emotional systems driving mindfulness include emotional regulation, fixed attention, and decentering; these systems may be affected in individuals with psychiatric disorders (Grabovac et al., 2011; Holzel et al., 2010).

Adolescents experience a high frequency and magnitude of physiological and psychological problems. These issues are due to biological, cognitive maturation issues, and relational issues such as peer acceptance leading to life dissatisfaction (Agarwal & Dixit, 2017). To cope with distressing feelings and conditions, adolescents develop harmful behavioral strategies such as self-blame, judgmental rumination, aggression, substance and alcohol abuse and problem gambling (Canale et al., 2016). Mindfulness may teach adolescents to observe and release thoughts and emotions that are usually avoided to give a peaceful mental breathing space created by recognizing, detaching, and breaking thought cycles (Shonin et al., 2012). The detachment from thoughts, feelings, and body sensations, enhances the capacity for emotional regulation. Additionally, mindfulness in adolescents promotes resilience, healthy character, coping skills and personality formation (Agarwal & Dixit, 2017).

In a systematic review including twenty-four studies, Zenner et al. (2014) assessed studies on school-based mindfulness interventions for students of grade 1-12. Positive effects were observed in psychological measures of stress, resilience, and coping but mainly in the cognitive domain. Results for the emotional measures (e.g., depression and anxiety) were not

significant (Zenner et al., 2014). This result supports the use of mindfulness to promote resilience through the ALLY intervention. However, further studies need to be explored to clarify the non-significant results on emotional measures. A Meta-analysis examining the effect of mindfulness on improving psychological outcomes in children and adolescents has shown positive benefits with small effect sizes (Zoogman et al., 2015). Most of the 20 included studies were school-based mindfulness programs. Results were not statistically significant when compared with active comparison groups though there were improvements from pre to post test. Authors suggested that mindfulness may be most effective when aimed at symptoms of psychopathology and in clinical populations. However, the small effect sizes limit the generalizability of these results and therefore must be interpreted with caution.

A clinical case study (Singh et al., 2007) examined three 7th-grade adolescents (13-14 years) who had received repeated disciplinary actions, were at risk of expulsion, had multiple instances of aggressive behavior at school, and had a diagnosis of conduct disorder, and poor grades. Each student had 12 sessions of one-on-one mindfulness over 4 weeks and subsequently, 15-minute monthly sessions for 25 weeks. As a result, the three students completed middle school without further threats of expulsion with a more than 50% decrease in aggressive behavior in the follow-up period; over a school year (Singh et al., 2007). These results address the knowledge gap regarding the efficacy of mindfulness programs for adolescents with mental health and behavioral difficulties that affect their school outcomes. Given that the population of interest for the present research includes children with similar behavioral profiles, these results are very promising. They suggest that mindfulness programs may enable adolescents to gain skills needed to access the curriculum and cope with problem behaviors. However, studies with larger sample sizes and comparison groups are needed to generalize the results.

Sibinga et al. (2013) conducted an RCT on 7th and 8th grade boys from low SES backgrounds ($N = 44$) using a Mindfulness-based stress reduction intervention (MBSR). Mindfulness was implemented by an experienced and trained mindfulness instructor for youth. The MBSR group had 12 weekly 50-minute sessions. The active control group had a health education program consisting of general health topics. Results showed that participants in the MBSR group had less rumination, less anxiety, and a reduction in negative coping methods. However, there were no significant differences between the groups (Sibinga et al., 2013). Although there are similar characteristics between this population and the population of interest, the use of a single study site, the small sample size, only males, and active control condition (which may result in smaller differences between intervention groups) limit the ability to generalize the results.

Furthermore, results from Sibinga et al. (2016) addresses the previous study's limitations. These results have been shown in a randomized controlled trial using a universal approach conducted on 5^{th}-8^{th} grade students ($N = 300$) from two public schools and from low SES backgrounds. The study evaluated the efficacy of adapted mindfulness-based stress reduction strategy (MBSR) compared with health education. Students in the MBSR group had significantly lower levels of depression, post-traumatic symptom severity, and improved psychological functioning (Sibinga et al., 2016). This high-quality study provides key evidence that mindfulness programs effectively reduce mental health symptoms and severity in those at greatest risk (i.e., those from low-SES backgrounds). Therefore, it is likely that these results will generalize to the sample of interest for the present study. Still, the study was carried out in an urban area and not rural like the population of interest so there may be some population

differences (e.g., economic factors such as more school supplies in urban vs rural schools) that may affect generalizability.

In conclusion, despite its benefits, there are several limitations of the previous studies that need to be addressed in the future (i.e., control group, sample diversity, fidelity). Moreover, recommended best-practice for mindfulness programs may limit its widespread implementation (Bluth et al., 2016). For example, it is recommended that the programs use a one-on-one or online approach. Furthermore, the physical space must be separate from the classroom and ensure that the student feels safe. Additionally, getting the cooperation and support of the school personnel to follow best practices may be difficult without substantial training. Lastly, the programs should be modified to meet the critical needs of the population of interest and be developmentally appropriate for the age (Bluth et al., 2016). The present study incorporated several of these best practices to improve the fidelity of mindfulness programming for children with little prior exposure to mindfulness.

2.4.2. Cognitive-Behavioral Therapy (CBT) Interventions

Over the years, cognitive-based interventions have increased in popularity and become the first line treatment of choice for a range of clinical disorders (Butler et al., 2006). The CBT model is based on three key assumptions that incorporate different techniques (Ducharme, 2007). First, people's interpretation of events (thoughts) influences their behavioral reactions. Second, thoughts can be accessed, negotiated, and modified. Third, altering a person's thought patterns in reaction to an event can result in an appropriate behavior. CBT assumes that an individual must first develop cognitive skills to observe one's thoughts and subsequently, challenge, correct, and replace problematic thoughts (Palmer & Williams, 2013). By identifying and re-examining ruminative thoughts, individuals can engage in more positive thinking and behavior (Birch,

2017). Individuals become more flexible and effective in dealing with life challenges by intentionally observing their thought patterns, strengths/limitations, and considering alternative ways of thinking and behaving (Padesky & Mooney, 2012). Research has shown the benefits of CBT for mental health outcomes in adults (Cristea et al., 2015), children (Hoying & Melnyk, 2016), and adolescents (Hoying et al., 2016) including improving skills (e.g., positive self-talk, positive thinking, dealing with emotions, reducing stress levels) and facilitating goal attainment.

School-based CBT interventions benefit children and adolescents with anxiety and depression (Haugland et al., 2020). A meta-analysis of 63 included studies on school-based CBT programs showed moderate effects on anxiety and small effects on depression compared to control groups (Mychailyszyn et al., 2012). Another meta-analysis of seventeen randomized controlled trials (RCT) of school-based mental health interventions using CBT for adolescents ages 11-19 years also showed a reduction in symptoms of depression (Kavanagh et al., 2009). Included studies that used a universal approach reduced symptoms of depression for up to four weeks post intervention. Additionally, interventions delivered only to youth with a high baseline level of depressive symptoms were the most effective, with the effect sustained for up to six months post-intervention. However, interventions delivered during the school day were effective for only four weeks post-intervention. Further, interventions provided by non-school staff, such as researchers and therapists were less impactful when compared with those by existing school staff (Kavanagh et al., 2009).

To further assess the state of the literature and high-quality studies, further exploration was done. Another randomized controlled trial in a mostly low-income, Hispanic population (67.5% of participants) was conducted to evaluate the efficacy of the COPE Healthy Lifestyles TEEN (Thinking, Emotions, Exercise, Nutrition) program (Melnyk et al., 2013) compared to an

active control group (Healthy Teen). The program consisted of manualized information sessions focused on common health topics for teenagers, such as infectious diseases, skin care, immunizations, road safety, and dental care. The study included adolescents aged 14-16 years and from 11 high schools (N = 779 total). The school health teachers administered the program. At post-treatment, adolescents in the intervention group had lower mean BMI than those in the active control group. Additionally, adolescents in the intervention group who had extremely elevated depressive symptoms at baseline had significantly lower depressive symptoms than the control group. Although these results suggest that CBT-based programs administered in school may improve physical and mental health outcomes in students from low-income backgrounds, the study only included a small percentage of African American students (9.9%). In addition, the participants in the study population were older than the target population. Thus, the results may not generalize to the target population for the present study.

There is evidence that CBT-based programs may be effective in younger and more culturally diverse samples. For example, Manassis et al. (2010) conducted a 12-week randomized control trial to measure the efficacy of a school-based group CBT program (The Feelings club) compared to a structured after-school activity group in 3rd-6th graders from a culturally diverse sample (N = 148). All the students had relatively high scores on anxiety and depression measures although most of them had sub-clinical symptoms. The population consisted of 56.8% Caucasians and 6.8% Hispanics. The participants received the intervention in groups of 5-10 per group. They had 1-hour weekly sessions for 12 weeks immediately after school. Simultaneously, the control group received structured, supervised sessions of equal duration, comprising three parent evenings of general childrearing conversations. To avoid cross-contamination of conditions, only one condition (control or CBT) was run per school at a given

time. Interventionists were psychology graduate students and Psychologists (Manassis et al., 2010). Although, there were no group differences, self-reported symptoms of anxiety and depression decreased significantly over time. The authors suggested the largely subclinical cases and active control group may have contributed to the insignificant results. Despite the high quality of this study, it only included a small percentage of African Americans (3.3%). Therefore, results may not be generalizable to the population of interest.

Even though the previous study participants had relatively high scores on anxiety and depression measures at baseline, they had subclinical cases. Conversely, the following study included students who met the diagnostic criteria for depression. Examination of this study will elucidate the possible differences in outcomes of school-based CBT programs relative to baseline symptomatology. Shirk et al. (2009) examined the efficacy of a manualized CBT program using a pre-post design for depression in adolescents ($N = 83$; 14-18 years) who school-based clinicians referred. Participants were from four high schools. Furthermore, participants met the diagnostic criteria for depression, had a history of traumatic experiences (44%), comorbidities (e.g., generalized anxiety disorder (44%), conduct disorder (32%) and social phobia (22%), and prior suicide attempt (42%; Shirk et al., 2009). There were 2 modes: individual and group. There were also variations in dose (brief and fewer than 10 sessions or standard and 12 or more sessions). The individual sessions served as the comparison group. The comparison group received core components of psychoeducation, cognitive restructuring, and mood monitoring. The treatment group received all that the comparison group received and activity scheduling, relaxation training, and problem-solving training. Over 50% of the sample was Caucasian, 20% were Hispanic and only 20% were African American. This targeted program consisted of 12 sessions administered by 8 doctoral-level psychologists. Participants' depressive rating scores

were three standard deviations above the normative mean at baseline. At post-treatment, depressive rating scores were within the normative range and the response rate was 64%.

Results indicated that more than a third of the participants retained their diagnosis of depression (Shirk et al., 2009). Suggested reasons for the results are that severe adolescent depression may require treatment of combined CBT and pharmacotherapy or a longer treatment duration. Other limitations include the lack of follow-up data due to lack of funds and inability to assess the durability of gains. In addition, there was a small sample size and outcome data were from self-reports (Shirk et al., 2009). Comparing the study by Manassis et al. (2010) to that by Shirk et al. (2009), results reveal that outcomes of school-based CBT intervention may not be remarkably different if subclinical or diagnosed depressive symptoms are considered. Despite the 64% response rate and a higher population of African Americans in the study by Shirk et al. (2009), results cannot be generalized to the population of interest because participants have a higher age group. Further, the lack of a control group serves as a threat to the study's internal validity.

Although overall CBT interventions are beneficial for children and adolescents with anxiety and depression (Haugland et al., 2020; Kavanagh et al., 2009), the studies described in this section revealed small effect sizes for improvements in depression and moderate effect sizes for improvements in anxiety disorders (Mychailyszyn et al., 2012). However, another potential limitation of school-based CBT-based programs is the need for programs to be administered by trained teachers (Melnyk et al., 2013) or clinical graduate students (Shirk et al., 2009), which may affect the cost and ability for implementation in low-income, under-resourced schools. Therefore, more studies with a higher percentage of culturally diverse groups, interventionists who are community members, and larger sample size are required to establish the efficacy of

school-based CBT interventions. Further, more studies will highlight the possible need for CBT to be used in combination with other therapies, its feasibility in rural Title I schools, and its generalizability. The present study attempted to fill some of these knowledge gaps through the ALLY program.

2.4.3. Motivational Interviewing (MI)

MI is a patient-centered technique used by clinicians to help improve clients' motivation and was originally developed to treat substance abuse (Rollnick & Miller, 1995). The goal of MI is to highlight the importance of change using the clients' perspective (Hettema et al., 2005). Intrinsic motivation to change a particular behavior is increased by drawing from the client's own goals, perceptions, and values (Harakas, 2013). With this approach, there is respect for the client's autonomy and a firm acceptance of the client's rights and capacity for self-direction. As such, the client makes the actual decision and argument for change. Moreover, MI explores and resolves ambivalence about changing personal behavior (Miller & Rollnick, 2002). MI is unique because its purpose is not to impart information or skills. Instead, MI mainly focuses on supporting clients' autonomy while exploring and improving their intrinsic motivation toward healthy behaviors (Barnett et al., 2012).

Theoretically, the approach of MI seems to address an adolescent's developmental need to exert their freedom, self-reliance, and ability to make decisions for themselves. At the same time, it respects their heightened levels of psychological reluctance and promotes the development of their decision-making skills (Naar-King & Suarez, 2011). In MI, deliberate statements are used to communicate compassion and allow the adolescent to respond to the practitioner's concept and thoughts about how the adolescent experiences the world (Naar-King, 2011). Meta-analyses examining the efficacy of MI on behavior changes in adolescents have

shown reductions in substance abuse (e.g., tobacco, alcohol, drugs, marijuana) problems (Lundahl et al., 2010; Naar-King, 2011), sexual risk behavior, gambling, and improvements in healthy behaviors (e.g., physical activity and diet; Cushing et al., 2014) and mental health (Dean et al., 2016). Therefore, MI is an effective and appropriate intervention for targeting child and adolescent health behavior changes when delivered individually by trained clinicians (Cushing et al., 2014; Gayes & Steele, 2014). However, there is a lack of school-based MI programs that use MI as a sole intervention to promote mental and physical health in youths.

2.5 Section 5: Combination of Evidenced-Based Programs

Thus far, this review of the literature has presented different school-based health promotion programs with small to medium effect sizes on mental health outcomes in children and adolescents (Andermo et al., 2020; Felver et al., 2016; Henry et al., 2020; Melnyk et al., 2013; Terry et al., 2021). However, integrating different elements of effective interventions for school-based health promotion programs appears to increase the strength and outcomes of school-based programs (Domitrovich et al., 2010). Another advantage of the integration of different interventions is that other techniques may better address specific outcomes, allowing sessions to be tailored to the diverse needs of the participants (Domitrovich et al., 2010; Weist et al., 2019).

2.5.1. Mindfulness and CBT

Mindfulness-Based Cognitive Therapy (MBCT) is a clinical modification designed to prevent the recurrence of depression by combining concepts from cognitive therapy with meditative practices (Segal et al., 2002) . Mindfulness-based stress reduction (MBSR) and MBCT are the most common and current standard manualized training programs for mindfulness-based interventions (Burke, 2010). The others are dialectic behavior therapy (DBT)

and acceptance-commitment therapy (ACT). MBCT has been modified in an eight-week protocol based on the original version of MBCT (Siegel et al., 2009) for generalized anxiety disorder (Evans, 2016). MBCT has also been adapted for treatment-resistant depression with good results (Kenny & Williams, 2007). Additionally, Williams et al. (2008) have used MBCT to treat bipolar disorder with significant improvements in symptoms (Williams et al., 2008).

Both MBSR and MBCT include weekly group sessions and the core curriculum of formal mindfulness practices (e.g., movement and walking meditations, body scan, and sitting; Burke et al., 2003). In addition, sessions include informal mindfulness practices where participants intentionally bring mindful attention to activities of daily living (e.g., eating, gardening, bathing, shopping). They may also incorporate regular home practice outside of sessions. Group sessions include discussion of experiences, psychoeducation (about the wandering mind, stress reactivity, the mind/body association, the role of perception, developing inner resources for coping and enhancing health), guided meditation practices, and teacher-led inquiry (Burke et al., 2003). MBCT includes additional exercises specific to depression and psychoeducation. The content in MBSR and MBCT can be adaptable to specific disorders and groups (e.g., eating disorders, anxiety, etc.). Furthermore, meta-analyses report overall medium effect sizes on outcomes measures of physical and psychological health in adults (Baer, 2003; Grossman et al., 2004), with authors suggesting that MBSR and MBCT may help improve psychological health and well-being (Burke et al., 2003). The difference between a mindfulness-based stress reduction group (MBSR) and a mindfulness-based cognitive therapy group (MBCT) lies in the intensity of the training, selection of the participants, and subsequent homework provided (Burke, 2010).

Mindfulness-based cognitive therapy for children (MBCT-C) is a structured group psychotherapy for children ages 9–13 years old, developed specifically to increase resiliency

through mindful attention (Semple et al., 2010). Assessing high quality studies, a systematic review (Kallapiran et al., 2015) was done to determine the effects of MBIs on mental health symptoms in children and adolescents. The review included only randomized control trials. Fifteen studies were included in the qualitative analysis and 11 were included in the meta-analyses. MBSR and MBCT-C were more effective in the nonclinical populations than in nonactive control. Mindfulness-based interventions may be useful in improving anxiety, stress, quality of life, and depressive symptoms in children and adolescents. However, a third of the studies were rated poor quality due to lack of blinding. Also, there was significant heterogeneity in some results due to MBSR modifications, and a wide confidence interval range. Further, the studies included different rating scales and age groups (Kallapiran et al., 2015).

Looking further into the literature, Semple et al. (2010) conducted an RCT with boys and girls aged 9–13 years (N = 25). Participants were predominantly from low-income and low SES households. Twenty-one participants were from ethnic minoritized groups (60% were Hispanic and 24 % were African American). The intervention group received weekly 90-minute sessions of mindfulness for 12 weeks from therapists. Results revealed significant reductions in attention problems and total behavior problem scores for those with an existing Attention-Deficit Hyperactivity Disorder (ADHD). At the post-test, three children who reported clinically elevated anxiety levels had reductions in anxiety symptoms. Those same students had significant improvements in total behavior problem scores. Although behavior problems were generally reduced, there were no significant group differences post-intervention or at follow-up. The major limitation was psychotherapy group effects whereby any participant may have had either a negative or a positive effect on the other members of the group (Semple et al., 2010).

In conclusion, mindfulness and CBT are beneficial for improving mental health (e.g., anxiety, depression) in children and adolescents (Kallapiran et al., 2015; Semple et al., 2010). However, the result of the highlighted RCT may not be generalizable to our population of interest based on variations in format (individualized vs. group). In addition, there was a small percentage of African Americans and a small sample size. Nevertheless, despite its limitations, the systematic review results were likely to generalize to our population of interest based on age, intervention type, and outcome variables. Importantly, the present study filled the knowledge gaps described by ensuring homogeneity across the intervention delivery through fidelity assessments (i.e., audio recording and transcription of sessions), uniform rating scales and age groups. However, even though blinding is generally challenging during face-to-face health coaching interventions, we maintained the utmost quality by ensuring proper randomization and high scientific standards to preserve internal and external validity.

2.5.2. MI and Mindfulness

One study combined MI and mindfulness-based programs to address mental health in adults (Peng & Wang, 2020). This study included 119 participants (ages 17 to 24 years) in three groups: mindful agency coaching (n = 45) which is a combination of positive psychology, mindfulness, and narrative approaches, mindful agency coaching plus MI (n = 24), and a control group (n = 50). The control group did not receive any intervention but was offered a course credit. The mindful agency coaching group completed eight, three-hour weekly group sessions The mindful coaching group had four 1-day workshops with all the sessions implemented in a lecture hall on the campus. In addition, the mindful agency coaching plus MI group completed five, one-on-one MI coaching sessions, lasting 40 to 50 minutes per session and eight, three-hour weekly group sessions. Participants in the mindful agency and mindful agency plus MI coaching

achieved significantly higher emotional intelligence, mindfulness, and self-efficacy than controls. Although there were no differences between the mindful agency and mindful agency plus MI group, further analysis showed that change in the mindful agency could completely mediate the change in cognition, self-efficacy, and emotional intelligence. The most notable limitations of this study were that participants were not randomized, and not diverse (90.76% female).

Additionally, students in the mindfulness agency group may have preferred individual and independent activities and therefore did not participate actively in group discussions. Second, participants in the mindful coaching only group had their sessions with the mindful agency coaching plus MI group. Therefore, they could have described their experiences from MI only with the mindful coaching participants. Conversely, some mindful coaching only participants may have gotten information about MI; therefore, the contact between these two intervention groups could have threatened the internal validity of the study. Last, self-report measures were used and therefore, there was the possibility of socially desirable responses (Peng & Wang, 2020). In summary, few studies integrate mindfulness and motivational interviewing. However, the described study shows positive results that can be replicated but may not generalize to the population of interest because of differences in study demographics.

2.5.3. MI and CBT

MI has been combined with modularized CBT to prevent, treat, and improve psychosocial outcomes in children and adolescents (Naar & Safren, 2017; Terry et al., 2021). Indeed, MI may complement CBT, since MI provides tools to increase client motivation and develop goals for behavior change, while CBT offers the client tools and processes to achieve their behavior goals (Westra, 2004). Terry et al. (2021) randomized 43 middle school students

(6th – 8th grade) into the Footprints program (which combines MI, CBT, and enhancement of protective factors) or a wait list control group. The intervention targeted students with less than average grades and/or disruptive behavior. The population consisted of over 80% African Americans. The Footprints program included 2 individualized MI sessions and 6 group CBT sessions of 5-8 students per group from the same grade level. Sessions lasted 30-50 minutes. Participants in the Footprints group had significantly higher grades in mathematics, higher self-efficacy, motivation, and behavioral and emotional functioning than the control group (Terry et al., 2021). Despite the positive results of this study, results do not generalize to the population of interest because the authors implemented their intervention using a targeted approach.

In a meta-analysis that analyzed twelve studies that combined MI and CBT for anxiety disorders, MI and CBT had significant moderate effects compared to traditional CBT across all the studies (Marker & Norton, 2018). The meta-analysis supported the inclusion of MI in both a pre-treatment and integrated format for combining MI and CBT for anxiety disorders (Marker & Norton, 2018). The results of this study supported the combination of MI and CBT for anxiety disorders. Still, more exploration is needed to clarify the effectiveness of studies that combine MI and CBT for depressive disorders/ symptoms. The following study was reviewed to examine the efficacy of combining MI and CBT for depressive disorders.

Cornelius et al. (2011), conducted a randomized controlled trial of MI and CBT among adolescents (15- 20 years) with comorbid Major Depressive Disorder and Alcohol Use Disorder. There was more improvement in depressive symptoms and alcohol-related symptoms at the follow-up assessment in the MI and CBT group than in controls (Cornelius et al., 2011). Importantly, participants were on antidepressant medication fluoxetine and the study was in an outpatient setting. As noted, few studies (Naar & Safren, 2017; Terry et al., 2021) implemented

integrated MI and CBT in school-based health promotion programs in middle school students to mitigate depression and anxiety, and improve resilience. The ALLY study filled this gap with a novel, universal, and culturally appropriate approach combining MI, CBT, and mindfulness.

2.6 Chapter Summary

Taken together, the studies presented in this chapter provide insights into the theories (e.g., SDT, SCT, SLT) and the impact of programs incorporating components of the ALLY program. Specifically, the guiding principles and impact of health coaching, mindfulness, cognitive behavioral therapy, and motivational interviewing were critically reviewed, focusing on the studies implemented with children and adolescents in schools. Study limitations and knowledge gaps were described to provide a rationale for adopting the ALLY individualized health coaching intervention for the population of interest and the potential impact of this program on mental health outcomes.

Chapter 3 – Implementation of an evidenced-based, universal program to promote mental wellbeing and strengthen protective factors among youth at a Title I school in rural Alabama Advocates for All Youth (ALLY)

Youth from minoritized backgrounds (i.e., Black, Hispanic, low-income) experience significant mental health burdens (Devenish et al., 2017; Hurd et al., 2013). Youth from low-income backgrounds that experienced adverse childhood experiences have reported feelings of isolation and rejection from peers, emotional neglect leading to elevated symptoms of anxiety and depression (Nock et al., 2013), higher incidence of suicidal ideations (Wang et al., 2019) and suicidal attempts (Thompson et al., 2019). Thus, this youth population represents a critical at-risk group that would benefit from programs focused on improving mental wellbeing and protective factors that attenuate these significant mental health burdens.

Health professionals have delivered school-based programs targeting youth with symptoms of depression and anxiety (Andermo et al., 2020; Felver et al., 2016; Hoying et al., 2016; Sarkissian et al., 2018). Specifically, programs focused on youth physical activity (Andermo et al., 2020), yoga (Sarkissian et al., 2018), mindfulness (Felver et al., 2016), and cognitive-behavioral therapy (CBT; Hoying & Melnyk, 2016). However, such programs have been found to be expensive and require specific mental health resources that low-income schools often don't have access to. Unfortunately, these interventions have not been widely implemented in schools that serve large percentages of youth with minoritized backgrounds due to program costs (Sarkissian et al., 2018). This leaves a significant equity issue for schools without funding for teacher training or access to trained professionals to deliver upstream prevention programs that focus on improving mental well-being and protective factors to assist students in becoming more resilient when faced with adversity. Thus, existing evidenced-based programs need to be implemented in schools that encompass more diverse student backgrounds to ensure equitable

program outcomes across all youth. Therefore, programs need to be designed for widespread dissemination with barriers to implementation and sustainability issues (i.e., cost, delivery challenges, and appropriateness of target population) addressed at the level of program development.

Advocates for All Youth (ALLY) program was developed with these implementation issues in mind and modified according to best implement science strategies with a focus on equity of program results. ALLY was adapted from an existing universal, school-based, resilience-focused health coaching program that improves mental health outcomes among urban, middle-class youth in Colorado (Lee et al., 2021; Sabin et al., 2021). ALLY was designed with flexibility to conform to many school structures and overcomes existing gaps within delivery of school based universal programs. First, ALLY is delivered using community volunteers (referred to as ALLYs or facilitators) versus requiring mental health professionals to significantly reduce program costs and increase community buy-in. Second, the program is universal, enrolling all students in the program versus other programs that only target youth with symptoms of depression and anxiety. With this, there is less stigma associated with the program, thereby leading to a high participation rate by students, teachers, and school communities (Lee et al., 2021).

Therefore, this study aimed to examine the feasibility and acceptability of delivering ALLY in a Title I school in rural Alabama that serves youth from a predominantly Black, low-income community. We hypothesized that the program would be feasible to implement and acceptable in the pilot school. However, we anticipated identifying additional barriers to implementation and sustainability unique to this population. This paper describes the key barriers and modifications for future implementation with similar populations.

Method

Design and Ethics Approval

ALLY was delivered at a Title I elementary school in rural Alabama that serves students from pre-kindergarten to sixth grade. Title I schools are schools with at least 40% of enrolled students qualifying for free or reduced school lunch. The students in this school are predominantly African Americans (59.02%) and from low SES backgrounds (median income of the county = $52,930). This study was designed as an opt-out, randomized controlled trial with wait-list control and was implemented in a Title I elementary school with 5th and 6th - grade students. Students and their parents/guardians could opt out of the program at any time. The parents provided written consent and the students gave assent before participating in the study. All study procedures involving participants were approved and implemented following the ethical standards of the Colorado Multiple Institutional Review Board (COMIRB # 21-3720) and clinical trials #NCT05025657.

ALLY Program Components

The program is delivered via a structured guide called the "ALLY Activity Workbook." This workbook was developed to ensure consistency in program delivery among ALLYs and included specific topics to discuss with students at each of the six sessions. Each student had their own individual workbook that was stored with the ALLYs and given to the student to keep once the program's six sessions were completed. The workbook was designed as a guide and with educational activities to create a safe space for open dialogue between the student and ALLYs. A complete list of each ALLY program component and the corresponding educational activity is outlined in Table 3.1.

Table 3.1

ALLY program components targeting the developed conceptual framework to improve protective factors (i.e., self-efficacy, resilience) for improving mental health outcomes among youth while honoring all cultural identities

Component	Educational Activity
Improve social connectedness	Recognizing how our actions may give the impression of being a good friend versus not being a good friend. Documenting individual names of adults in their support system including those in their family, school, and wider community
Create positive self-view	Identifying student's strengths and values from the perspective of self, friends, and family/community. Recognition of negative thoughts and strategies to reframe into positive thoughts
Grow through individual development	Introduction to a variety of coping skills that throughout the program build a "coping kit" for them to use in the future. Understanding how our bodies react to stressful situations, physically, psychologically, and behaviorally and developing strategies to reduce stress when these situations occur. Identification of problems student's face and recognition of problems they can solve on their own versus when they need to seek help from an adult. Strategies to identify problems, create possible solutions, choose potential outcomes for each possible solution and then create the best solution to fix said problem
Share resources to meet basic needs	Building emotional vocabulary to help students identify the emotions they feel and improve their ability to communicate the feeling more clearly to others as well as how to manage their own emotions as needed. Understanding how our emotions make us feel and lead us to being in a positive versus low mood; and how are body and mind feel during those moods. Understanding and recognition of the powerful relationship between how we think and feel and how these

	can influence how our body and mind feel and function
Support the formation of positive relationships	Creating a plan on how to reach out for support including when and how to reach out and what to do if their support person can't help. Identifying and naming supportive adults at home, school, and wider community Providing education to all students using a universal program which focuses on building school cultures that support the formation of positive relationships

ALLY Facilitator Training

Eight ALLY facilitators participated in the project. The ALLY facilitators received training based on the ALLY resiliency protocol by professionals in implementation science, behavioral therapies, and public health (Details in Table 3.2). In addition, ALLY facilitators completed a background check through the Alabama State Department of Education, receive training specific to the intervention, and completed mandatory reporter training.

Table 3.2

Details of Facilitator Training

Training	Details
CITI Training (2.5 hours)	IRB #1 Health Science Emphasis
	Research in Public Elementary and Secondary Schools
	Research with Children
	HIPPA and Human Subjects Research
	IRB #2 Social and Behavioral Emphasis
Minors on Campus Training (1 hour)	Interactive video
RedCap Training (2 hours)	Videos on how to use RedCap

ALLY Session 1 (1 hour)	a. Part 1: Intro to ALLY program b. Part 2: Role of the ALLY facilitator c. Part 3: Communication Skills
ALLY Session 2 (2 hours)	a. Part 4: Coaching Relationship Skills and Presence b. Developing Cultural Humility c. ALLY Simulations (3, 20-minute sessions)
ALLY Session 3 (2 hours)	a. Mindfulness Practice b. Part 5: Psychology of Motivational Interviewing c. ALLY Simulations (3, 20-minute sessions)
ALLY Session 4 (2 hours)	a. Part 6: Changing Mindset and Behavior b. Implementation Science and Intervention Fidelity c. ALLY Simulations (3, 20-minute sessions)
ALLY Session 5 (2 hours)	a. ALLY Simulations Mix-up 1 b. ALLY Simulations Mix-up 2
ALLY Session 6 (1 hour)	ALLY Workbook Review
ALLY Session 7 (1 hour)	ALLY Workbook Review continued
Safe Zone Training (2 hours)	Part 1
Safe Zone Training (2 hours)	Part 2
ALLY Session 8 (1 hour)	RedCap review
Mindfulness Training (1 hour)	Review of Mindfulness Facilitator Guide

ALLY's Educational Activities

The educational activities that comprise the ALLY Activity Workbook are divided into six sessions with three specific concepts to cover during that 30-minute session (Table 3.1).

Session 1

This session focuses on building rapport between the student and ALLY. First, using a worksheet entitled "Allow me to introduce myself" the student and ALLYs take turns completing pre-identified sentences. Examples include "please call me…"; "I prefer to communicate with friends by…"; "I am very good at…"; "my favorite traditions are…"; "when I get upset, I tend

to…"; etc. Second, the ALLYs assist the student with developing a positive self-view. The student then identifies their strengths and values through their personal view and then moves on to determine how their friends and family may view their strengths and values. Third, the ALLYs discuss the topic of negative versus positive thoughts and work with the student to complete a worksheet that teaches the student how to reframe their negative thoughts into more positive thoughts.

Session 2

This session discusses the topic of building healthy relationships. First, students complete a worksheet on "how to be a good friend" by recognizing how various actions may give someone the message that they are being a good friend versus not being a good friend. Second, the student identifies his/her support system ("my support universe") by naming adults in their family, school, and wider community that the student can talk to when support is needed. Third, the ALLY and the student discuss strategies needed to reach out for help. The "reaching out" activity asks the students to identify who they can ask for help, recognize how this person will help them, plan when and how they will reach out to this person, and creates a backup plan if the person can't help so they can start over with making a new plan. Session 2 also introduces the "Mind & Body Wellness Plan" worksheet (see more details below under "Homework") that allows the student to learn to set their own weekly goals with support from their ALLY.

Session 3

This session discusses developing individual level coping skills. First, mindfulness is introduced in this session as "Mindfulness 1". Full details of the mindfulness activity will be discussed below under "Mindfulness." Second, the student and ALLY create a coping kit and list activities the student can use at home, school, and with friends if they find themselves in a situation

in which they feel uncomfortable or stressful. Third, the ALLY helps students understand their reaction to stressful situations from a physical, psychological, and/or behavioral response. Finally, the student completes a worksheet that reviews common stressful situations (e.g., taking a test, losing a game, fighting with a friend) and the student's reaction to these experiences.

Session 4

This session focuses on teaching students how to properly name emotions and begin the process of recognizing how emotions make them feel and may alter their moods. Second, the student and facilitator complete the "Mindfulness 2" activity (described in detail below). Third, a facilitator helps the student build an emotional vocabulary and how to identify various emotions by being as specific as possible. Through this activity, the student learns how to 1) improve their ability to understand how they are feeling, 2) best communicate the feeling more clearly to others, and then 3) manage their own emotions when needed.

Session 5

This session moves the conversation to problem-solving and provides the student with the perspective of situations they can solve on their own versus when they need help from a supportive adult. First, the student and ALLY discuss examples of common problems students face and determine if the problem is "a glitch," "a small problem," "medium problem," "big problem," "gigantic problem," and "emergency." Second, students are taught to identify a problem and then move to think about two possible solutions to this problem. Each solution is then broken down to identify possible positive and negative outcomes. Third, the student learns how to decide the best solution to solve this problem based on these outcomes. Finally, the student is also taught how to break down the best solution into smaller tasks to make the solution easier to achieve.

Session 6

The final session has three focus areas. First, students learn about the mind-body connection and how we think and feel emotionally can influence how their body and mind may feel and/or function. Second, the ALLY teaches students how to maintain a healthy mind and body by being physically active, limiting screen time, eating a variety of fruits/vegetables, and getting adequate sleep at night. Recommendations for each of these health behaviors are discussed, and examples for improving each behavior are reviewed. Third, as ALLY is designed as a tool for the students to use as a resource, this session also allows time for the ALLY and student to review each skill from the program and discuss a plan of how the student can use these tools in the future.

Mindfulness

Mindfulness is used as a coping tool/technique for the students throughout the program as part of their "coping kit." The concept of mindfulness is taught in two parts, 1) educating the student on the topic of mindfulness (i.e., what is mindfulness and how to bring mindfulness to daily activities); and 2) teaching "self-compassion" as a specific mindfulness strategy. Students are also provided with a worksheet "Mindfulness Home Practice" with three activities they can practice at home.

Homework

The student, between sessions, completes additional worksheets to reinforce concepts learned during the session. Together, these homework worksheets teach the student how to use the tools they learn during each session to provide a solid framework of skills the students can continue to develop and grow. The ALLY also teaches the student how to set Specific, Measurable, Action-Based, Realistic, Time-lined (S.M.A.R.T.) goals. After Session 1, the student completes the "Positive Thought Journal" to document negative thoughts they may have in the next week and

then “reframe” the thought into something more positive. After Sessions 2-5, the student completes the “Mind & Body Wellness Plan” focused on setting goals that help the student create a healthy mind and body goal, a personal goal. The student identifies potential barriers they may face and how to use their coping skills to stay on track. During Sessions 2-5, the ALLY reviews the student’s plan and can guide the student to integrate action steps, identify and surmount barriers, and provide genuine affirmative support to help students work toward each goal. The ALLYs summarize their view of the student’s progress and ask the student to reflect on their own view throughout the intervention period while addressing steps to maintain success.

Program Delivery

The program was delivered by community volunteers (ALLYs) with no prior mental health training required. The ALLY facilitators included eight non- Hispanic, Caucasian, undergraduate students, or research staff at Auburn University (Auburn, Alabama). All facilitators attended 13 hours of didactic and hands-on training led by the ALLY principal investigator (Kaar, JL) and a team of researchers. All facilitators had background checks and required research certificates before delivering the program. ALLY was delivered at the school during the school day in a designated area selected by the school (i.e., library, teachers’ lounge). Each student was assigned to a facilitator with whom they met weekly for 30 minutes until all six program sessions were completed. A site coordinator assisted facilitators, students, and school staff as needed throughout the full implementation process. The site coordinator focused on 1) ensuring students attended program sessions with little disruption to the class, teachers, and other school staff; 2) addressing any concerns raised by the facilitators during or after sessions; and 3) ongoing discussions with school staff to troubleshoot unexpected issues with program delivery (i.e., internet problems,

student scheduling issues, etc.). After the study, the administrators, teachers, and facilitators filled out surveys that showed how comfortable and safe the students felt during the program.

Data Collection

All program modifications were documented throughout the implementation process to ensure transparency of delivery using FRAME along with the coding system (Rabin et al., 2018; Wiltsey Stirman et al., 2019). Evaluations of program materials, delivery, assessments, implementation of sessions, and facilitators' training sessions were gathered from school administration, teachers, facilitators, students, and researchers throughout the implementation process. In addition, all feedback was documented at the level of each adaptation, including a description and reason for the modification, identified person(s) that provided feedback, what was modified, level of delivery of modification, content, or context of modification, and lastly the impact of the modification, if known.

Results

Of the 88 students enrolled in 5^{th}-6^{th} grade at the time of program delivery, 80 (91%) chose to participate in the program and assented to participate in the research program. A total of eight students opted out of the study (n = 4 reported language barriers; n = 4 personal reasons not disclosed). All students *(*N = 80) completed the pre-assessment, which documented consent to participate in the program. Students were randomly assigned to the intervention (n = 41) or waitlist control group (n = 39) by the ALLY principal investigator (Kaar, JL). Of the participating students, 51.3% were female,16.3%were Hispanic, and 68.8% were Black or African American.

Post-test assessments were completed by 76% of students in the intervention group (n = 31) and 82% of students on the waitlist control group (n = 32).

Table 3.3 summarizes the components of the program that were delivered. Almost all (98%) of the students who started the program completed all six sessions. The session lengths

varied each week. Although the target time was 30 minutes, many variables impacted the session time, including student cooperation, early pick-up, classwork, testing times, lunchtimes, or other school activities. The facilitators did not always assign the homework activities for the student to complete. The facilitators reported not assigning homework for a variety of reasons, including time restrictions for the sessions by school administrators or teachers and the urgency of the student to return to class for academic work, testing, physical education, or other activities. There was large variability (55.4%) in students returning the homework the following week when homework was assigned. Students reported to the facilitators the following reasons: they did not remember to bring it to school or misplaced it. Each session was most often subsequently completed each week over the course of six weeks. For example, during the week of session 5, the students had Thursday and Friday off that week due to a holiday. This led to 40% of the students not receiving their session that week and the session was made up the following week, with session 6 following the break.

Table 3.3

Details of ALLY Program Session

Intervention delivery	**Students, n (%)**	**Sessions Length, Minutes mean±sd**	**All session activities completed**	**ALLY assigned homework previous week**	**Completed the homework assignment**	**Completed session during appropriate week**
Session 1	41 (100%)	25 ± 6	41 (100%)	NA	NA	36 (88%)
Session 2	41 (100%)	24 ± 6	41 (100%)	6 (15%)	6 (100%)	38 (93%)
Session 3	41 (100%)	26 ± 8	41 (100%)	26 (63%)	13 (50%)	37 (90%)
Session 4	41 (100%)	28 ± 8	41 (100%)	36 (88%)	22 (61%)	38 (93%)
Session 5	40 (98%)	21 ± 7	40 (100%)	32 (80%)	18 (56%)	26 (60%)
Session 6	40 (98%)	18 ± 6	40 (100%)	21 (53%)	8 (38%)	37 (93%)

*****NA – Not Applicable

Program Modifications

Contextual Modifications

Program Assessments.

Delivery. The pre-test assessments were administered via tablet/Chromebook. Unfortunately, this delivery method did not work due to the school's slow and spotty Wi-Fi access. Students quickly reported that they started the assessment and then were cut off due to internet concerns. Students and teachers became frustrated with this situation. As a result, the school's staff, facilitators, and researchers chose to collect pre-test assessments with paper & pencil to avoid such issues.

Reading Level. The facilitators quickly learned from the students that delivering assessments via group format was not working as many students raised their hands and asked for help because they did not understand the questions. Students also started discussing their answers with their classmates, which eventually led most students to complete the assessment without reading the questions. Although the assessments used have been previously validated for the age of our population of students, the reading level was too advanced. To combat this issue and maintain the use of validated assessments, all assessments were moved to individual, one-on-one sessions with the facilitators. The facilitators then read each question to the student verbatim to not compromise the integrity of the assessment.

Number of Assessments. The pre-assessment included 150 questions to capture key study outcomes. The students had one class period to complete the assessment (50 minutes); however, despite all the students finishing the surveys, very few students were able to answer the questions accurately (n = 10; 8.0%) due to a lack of focus on the large number of questions. Key

study outcomes were re-evaluated and reduced by researchers. The post-assessment included 74 questions; which students completed on average 20 minutes.

In summary, the program assessment modifications including changing the delivery (i.e., paper & pencil, facilitators reading questions individually to student) and reducing the questions (i.e., number of questions) resulted in higher numbers of students that were able to complete the post-test assessments. Also, by making these changes, the burden of the study was substantially reduced for all parties, school staff and students, and the facilitators.

Homework. An average of 24.2 (59%) of the students were assigned the weekly homework, and 38 – 100% completed the weekly homework sheets. Primary reasons for lack of completion by the students included 1) time management issues and 2) misplacing the sheets. The ALLY did not always assign the homework activities for the student to complete. Facilitators reported not assigning homework for a variety of reasons, including time restrictions for the sessions by the teachers and the urgency of the student to return to class for academic work, testing, physical education, or other activities. When homework was assigned, there was large variability in students returning the homework the next week. Students reported to the facilitators the following reasons: they did not remember to bring it to school or misplaced it.

Table 3.4

Contextual Modifications

Modification	Delivery of Program Assessments	Length of Program Assessment	Reading Level of Assessments	Homework

Description	Program assessments were designed to be completed on tablet/Chromebook	Program assessments were 150 questions in all	Program assessments were validated for age of students; however, reading level was not at the level needed for our population	Program assessments were designed to be completed in sheets weekly
Reason	Wi-Fi access was limited and led to problems with students completing assessments	Students found it difficult to focus on the questionnaires and had problems completing the assessments	Assessments ranged from 6-8th grade reading level and our population average reading level was 3rd grade	Homework was most times not done due to problems with time management, misplacement of sheets and inability to articulate thoughts in writing
By WHOM	Facilitators	Researchers	Researchers	Researchers
WHAT	Assessments moved to paper & pencil	Number of assessments were reduced to a total of 74 questions	Moved assessments to one-on-one versus group setting in order for the facilitator to read the questions to the students	Converted sheets of homework to a spiral bound homework book, included a reflection page and a schedule
Level of DELIVERY	Facilitators	Facilitators	Facilitators	Facilitators
CONTEXT	Format	Format	Format	Format
IMPACT	Higher completion of assessments	Higher completion of assessments	Higher completion of post assessments	Higher completion of Homework

Content Modifications

Health Literacy. ALLYs found that many students didn't understand the concepts the program was targeting, including reframing negative thoughts, the impact of emotions on mood, and the mind and body connection. Although not measured directly, ALLYs, school staff, and researchers found that the students were unfamiliar with mental and physical health concepts. ALLYs reported creating an impromptu dialogue with students that struggled in hopes of delivering the program's key messages. Examples included using Tik Tok videos to show the students videos of key concepts and using the program materials.

Student Workbook. The ALLYs reported struggling with the student workbook activities when the students didn't understand the documented examples. The ALLYs did their best to give additional examples to the students to the best of their ability. The ALLYs frequently connected with the on-site coordinator to assist them with alternative explanations and more examples as needed.

Mindfulness Content. The program consisted of two mindfulness-related educational sessions. ALLYs reported that students had no prior knowledge of mindfulness and therefore struggled to understand or participate in these sessions. In hopes of educating the students on mindfulness, the ALLYs introduced TikTok videos. ALLYs reported that students appeared to be more engaged with the videos and learned these new concepts in shorter time periods.

Table 3.5

Content Modifications

Modification	Addition of program content to improve health literacy	Facilitator guide	Condense mindfulness content
Description	Program designed to suite 6th grade	Program designed with detailed mindfulness approach	Program designed to have mindfulness in two sessions.

	students with health literacy		
Reason	Students in the Title I schools have low health literacy	Facilitators needed more details for session delivery	Mindfulness is a new concept and student struggled with understanding it
By WHOM	Researchers	Researchers	Researchers
WHAT	Additional health literacy sessions included	Detailed facilitator guide created	Incorporated mindfulness into all sessions; broke it down to more understandable pieces
Level of DELIVERY	Facilitators	Facilitators	Facilitators
IMPACT	Better understanding of key concepts	Better delivery by facilitators	Higher understanding and willingness to adopt mindfulness

Discussion

ALLY was logistically feasible in a Title I school in rural Alabama with high student engagement (93%). Students randomized to the intervention could attend all six sessions within eight weeks of the semester. Students reported that they felt comfortable and safe interacting with the facilitators. Despite these successes, many modifications to the program content were needed. The majority of modifications can be connected to the low literacy level of the students in this community. Low literacy of the student population sheds light on the lack of potential adaptability of a mental health promotion program in similar communities. Students didn't understand many of the terms (i.e., "mood," "feeling alone," and "depressed"), leading to great difficulty in collecting pre-post assessments of program outcomes as well as delivering key program concepts. Further modifications of the program content are needed to combat such issues before delivering to a new cohort. School-based programs should consider first establishing the student's level of physical and mental health literacy to ensure that the students can attain the key program concepts. One possible way to do this would be to consider incorporating educational sessions that focus on

health-related concepts before program delivery to ensure a certain foundation of mental health literacy. Further, such activities need to be taught at the students' level. Therefore, it may be more appropriate to consider using more hands-on activities (i.e., play-doh, slime), picture charts, games, and videos focused on improving mental health education (McCormack et al., 2017). Such recommendations will enable future programs to be appropriate for lower reading and health literacy students.

The second barrier to implementing the ALLY program content was the student's familiarity with mindfulness. Many modifications were needed for the mindfulness component of the program due to a lack of familiarity with basic concepts and terminology. Future programs that include mindfulness content should consider introducing such components incrementally using brief amounts of time (3-5 minutes). This aligns with the recommendation of other programs that include mindfulness using multiple sessions with a focus on teaching one mindfulness technique each week, in particular when mindfulness is a new concept (Bluth et al., 2016; Costello & Lawler, 2014; Kabat-Zinn, 2003; Zoogman et al., 2015).

The students, school staff, and researchers found utilizing community volunteers to deliver the program acceptable, making it a possible model for sustainability in high-risk, low-income communities. Recruitment of community volunteers is not a new concept and has been previously reported with improving program buy-in when delivered by local facilitators (Griner & Smith, 2006; Planey et al., 2019). However, although local community volunteers were used, differences in race, ethnicity, and socioeconomic status existed. Such differences have the potential to lead to lower improvements in key program outcomes and need to be considered when delivering future programs (Brody et al., 2006; Ingoldsby, 2010; Kumpfer et al., 2002; Nash, 2007; Snowden, 2001). One way to overcome this issue is to ensure the students have adequate time to develop a level of

trust and rapport with their ALLYs. Therefore, we recommend dedicated time for rapport building for the ALLYs and students to interact before the program is implemented.

To ensure the ALLYs deliver the program as designed, a well-documented educational manual focused on program delivery is critical. Using this approach, the key program concepts that need to be delivered can be noted for each session, focusing on common problems and solutions experienced in the past. In addition, future studies should ensure proficiency of the program implementation via fidelity measures, including documentation of facilitators' cultural competency and humility when a racial mismatch occurs (Bluth et al., 2016; Kumpfer et al., 2002; Small et al., 2021).

In conclusion, delivering ALLY in a rural, Title I school was deemed feasible and acceptable as assessed by the surveys filled by facilitators, administrators, and teachers; however, modifications were needed. Our hypothesis regarding lower health literacy and educational level was confirmed, and even though we made initial changes before delivering ALLY to address this concern, further work is needed. The findings from this study have provided documentation of the barriers we faced, and recommendations on how to improve the delivery of a universal, school-based program focused on improving mental wellbeing and protective factors among youth in a high-needs community. Future work observing program outcomes in such populations is needed. In addition, future implementation efforts should include more rigorous methods for evaluating program delivery, implementation, and other measures of fidelity.

Chapter 4 - The effects of the modified ALLY program on resilience, self-efficacy, mental health, and physical health in 6th graders from rural Title I schools

The Advocates for ALL Youth (ALLY) program is a 6-session (30-minutes/session) school-based, universal program administered by community facilitators to increase resilience and self-efficacy and reduce mental health symptoms in middle-school students. The program has been implemented with 6th-grade students in two urban middle schools in Colorado (Lee et al., 2021; Sabin et al., 2021). In the first study, 6th graders (N = 287; 68% Caucasian, 18% Hispanic, 2.8% Black) who participated in the intervention reported higher self-efficacy, grit, and resilience at post-test compared to pre-test (Lee et al., 2021). In the second study, 285 6th graders (71% Caucasian, 15% Hispanic, 4% Black) participated in the program. Again, the program had moderate effects on self-efficacy (0.7) and resilience (0.5) from pre-test to post-test. Additionally, participants who endorsed negative affectivity (i.e., students who scored mild or higher for symptoms of both depression and anxiety; T score of 55 or higher or raw score of 12 or higher for anxiety and a raw score of 10 or higher for depression) reported decreased anxiety, depression, and increased self-efficacy at post-test compared to pre-test (Sabin et al., 2021). Although these results are compelling, it is unclear if the program would yield similar outcomes for other populations (e.g., African American/Black students). Moreover, both studies implemented a one-group pre-post design, which increases the risk of bias and reduces internal and external validity (Handley et al., 2018).

To address these knowledge gaps, a pilot program, randomized-control intervention was implemented in a rural Title I school in Alabama, predominantly serving economically disadvantaged African American/Black students (N = 80; ALLY n = 41/ Control n = 39, 62% African American/Black; see Chapter 3 for details). Several modifications were made to the program to improve delivery, as well as the measurement of program outcomes and fidelity to

address child-level barriers (i.e., low reading level, low health literacy, difficulty completing worksheets, difficulty understanding key program concepts) and facilitator-level barriers (i.e., difficulty providing relevant examples of key concepts, variability in session duration and content delivery). The Mind and Body Wellness Plan (a component of the homework) includes discussion points for activities that promote a healthy body (e.g., physical activity, healthy nutrition, adequate hydration), healthy mind (e.g., mindfulness, journaling), potential barriers to these activities, and coping skills. Moreover, this would potentially improve physical health outcomes. Therefore, the primary aim of the present study was to measure the efficacy of the modified ALLY program on resilience and self-efficacy, mental health (e.g., anxiety and depression), and physical health (e.g., physical activity) in a larger sample of 6th graders from rural, Title I schools in Alabama ($N = 110$).

Hypothesis 1: Greater levels of resilience (Child and Youth Resilience Measure; Jefferies et al., 2019) and self-efficacy (Self-Efficacy Questionnaire for Children (SEQC); Muris, 2001) will be reported by ALLY program participants at post-test compared to pre-test; no such difference will be observed for the control group.

Hypothesis 2: Lower levels of depression and anxiety (PROMIS depression and anxiety; Irwin et al., 2010) will be reported by ALLY program participants at post-test compared to pre-test; no such difference will be observed for the control group.

Hypothesis 3: Greater physical activity (PROMIS Physical Activity Survey; Tucker et al., 2014) will be reported by ALLY program participants at post-test compared to pre-test; no such difference will be observed for the control group. Note: this is an exploratory hypothesis given that previous ALLY intervention programs did not emphasize how students can change physical health outcomes.

A secondary aim of the study is to determine if changes in resilience or self-efficacy mediate the effects of the ALLY program on mental and physical health outcomes.

Hypothesis 4: An increase in resilience and self-efficacy will mediate the relationship between ALLY program participation, mental health outcomes (i.e., depression and anxiety) and physical health outcomes (i.e., physical activity).

This study will provide evidence of the efficacy of the ALLY program in an under-served population of youth at the greatest risk for mental health disparities (Lee et al., 2021; Sabin et al., 2021). Moreover, this study will help determine potential psychological mechanisms underlying changes in mental health outcomes resulting from program participation.

Method

Participants

Three Title I schools in rural Alabama participated in the study. Title I schools are schools with at least 40% of enrolled students qualifying for free or reduced school lunch. Table 4.1 provides the percentage of students classified as "economically disadvantaged" and the percentage of students classified as Black based on the Alabama State Department of Education Report Card, which provides demographic information for each school. The table also provides the final sample of students included in the ALLY and Control groups. Parents received consent letters and students provided verbal assent to participate. Parents and students could choose to opt out of the study at any time. All procedures were approved by the Institutional Review Board at the University of Colorado and Auburn University.

Table 4.1

Number of Participants in the Intervention and Control Groups by School

School	% Economically Disadvantaged	% African American/ Black	Total	ALLY	Control
School A	70.17	95.59	75	39	36
School B	66.15	81.68	16	8	8
School C	79.02	59.02	18	10	8
Total	NA	NA	109	57	52

Note: based on school-level data. NA – Not Available

In School A, there were 80 students in 6th grade; five students (6%) did not participate in the study (n = 75 participants). Reasons for not participating include suspension (n = 1), unknown reasons (n = 4). In School B, there were 20 students in 6th grade; 4 (20%) students did not participate in the study (n = 16 participants). The reasons for not participating include transfer (n = 2) and online student (n = 2). In School C, there were 20 students in 6th grade; 2 (10%) students did not participate in the study (n = 18 participants). Reasons for not participating were non-resumption despite enrollment (n = 1) and personal reasons (n = 1).

The sample of students that completed the study was 109 (61 female/48 male) with ages ranging 11-13 years. The composition of the sample included 99 (91%) African American and 10 White (9%; 7 Hispanic, 3-Non-Hispanic) students. There were 75 (69%) students from School A, 16 (15%) from School B, and 18 (16%) from School C. Overall, there was 96% session completion rate. Of the 57 students in the ALLY intervention group, 2 students attended 5 out of 6 sessions and did not complete post-test because one student was suspended, and one student had repeated absences. Of the 52 students in the control group, 2 students did not complete post-test at the end of the study because of suspension. One student in the control group spoke Spanish and a translator was available for the health literacy session and pre/post-test assessments.

Modified ALLY Program

Table 4.2 describes the three sessions added to the ALLY program before pre-test assessments were administered. First, two group health literacy sessions (1 hour total) that included age-appropriate games, TikTok videos, picture charts, and interactive materials (i.e., stress balls, play-doh, and slime) to provide students with exposure to key physical health (e.g., types of exercise/physical activity) and mental health (e.g., mood, what is resilience, positive thoughts, coping skills) concepts. An additional introduction session (15-20 minutes) was included to help develop rapport between each facilitator and student. During this session, facilitators and students discussed likes and dislikes, hobbies/activities, details about their family, cultural activities, etc.

Table 4.2

Sessions Added Before Pre-Test Administration

Sessions	Content	Duration
Health Literacy (2 group sessions)	A. Resilience B. Physical activity C. New words (e.g., suppress, daze, positive) D. Emotions (emoji bingo game) E. Coping skills F. Support system G. Mindfulness (TikTok)	1 hour
Introduction (1 individual session)	Conversation starters to introduce the student and facilitator (e.g., hobbies, family traditions, learning styles, interests)	15-20 minutes

Table 4.3 describes the content of each session for the previous ALLY program and the modified ALLY program. Briefly, more content was added to each session to reinforce students'

understanding of key concepts. Mindfulness was included in each session. The Mind & Body Wellness Plan was reviewed during sessions 2-5.

Table 4.3

Changes in the Content for Each ALLY Session

Session	Previous Program	Modified Program
Session 1: Developing a Positive Self-View	A. Introductions B. Strengths and Values C. Optimistic Views	A. Strengths and Values B. Optimistic views C. Homework: (Positive Thought Journal) D. Introduction to Self-compassions E. Mind & Body Wellness Plan (Goal setting, Coping skills chart) F. Mindfulness (arrival breaths)
Session 2: Building Healthy Relationships	A. How to be a Good Friend B. Identify my Support System C. Reaching Out D. Mind and Body Wellness Plan	A. Introduction to Mindfulness (Mindfulness to Sound) B. How to be a Good Friend C. Identify My Support System D. Reaching Out E. Mindfulness (Arrival Breaths) F. Homework (Mind & Body Wellness Plan, Mindfulness Home Practice)
Session 3: Coping Skills	A. Introduction to Mindfulness 1 B. Creating my Coping Kit C. Understanding Stress & Support	A. Mindfulness Practice (Body Scan) B. Creating My Coping Kit C. Understanding Stress and Support D. Mindfulness (Arrival Breaths) E. Homework (Mind & Body Wellness Plan, Mindfulness Home Practice)
Session 4: Name that Emotion	A. Introduction to Mindfulness 2 B. Emotions Cheat Sheet C. Emotional Vocabulary D. Understanding my Feelings & Mood	A. Mindfulness Movement (Overhead Stretch) B. Emotional Vocabulary C. Emotions Cheat Sheet D. Understanding my Feelings & Mood E. Mindfulness (Arrival Breaths) F. Homework (Mind & Body Wellness Plan, Mindfulness Home Practice)
Session 5: Problem Solving	A. Is it an Emergency? B. Finding a Solution C. Breaking It Down	A. Mindful Movement (Hands to Shoulders) B. Finding a Solution C. Breaking It Down D. Mindfulness (Arrival breaths)

		E. Homework (Mind & Body Wellness Plan, Mindfulness Home Practice)
Session 6: Self-Care Plan	A. Mind and Body Connection B. Review Sessions C. Using my ALLY Toolkit	A. Mindful Movement (Walk in Place) B. The Mind-Body Connection C. Review Sessions D. Using my ALLY Toolkit E. Mindfulness (Arrival breaths)

Fidelity

To ensure fidelity (alignment to the study protocol) and reduce variability amongst facilitators, randomly selected sessions were recorded and transcribed. Facilitators provided written consent to have their sessions recorded. The fidelity assessment ensured consistency in program delivery by the facilitators and that students demonstrated an understanding of key concepts. Zoom was used to record and transcribe sessions and archived on a secured Microsoft Box folder to ensure confidentiality. The fidelity rubric is provided in Table 4.4.

Table 4.4

Fidelity Rubric

Question	Response
Did the facilitator complete all aspects of the session (activity workbook)?	Yes / No
How many minutes did the session last?	< 30 minutes / > 30 minutes
Did the students respond to questions and participate in the activities?	Yes / No
Did the facilitator do the mindfulness activity with the student?	Yes / No
Was the homework done? A. Positive thought journal B. Mind and Body Wellness Plan C. Schedule D. Goal for the week	Yes / No
Was the homework reviewed during the session?	Yes / No
Did they set goals for the following week?	Yes / No

ALLY Facilitators

Nine non-Hispanic, Caucasian, ALLY facilitators participated in the project. The ALLY facilitators received training from Dr. Kaar and her staff, which include professionals in implementation science, behavioral therapies, and public health. In addition, ALLY facilitators completed a background check through the Alabama State Department of Education, received training specific to delivering the intervention, and completed mandatory reporter training. All facilitators completed weekly 2-hour sessions for eleven weeks to discuss the following: 1) defining resilience; 2) therapeutic communication skills including reflections of meaning, feeling, content, and summarizing; 3) creating a focus and building motivation, and 4) motivational interviewing, and cultural competency. The training models for the facilitators and curriculum facilitated discussions with ALLY program participants on topics including what resiliency is, how to set goals, and how to attain goals that improve resilience. Full details of ALLY facilitator training are described in Chapter 3 and elsewhere (Lee et al., 2021). For the present program, ALLY facilitators completed 6.5 hours of additional training covering cultural competence (1 hour), child engagement (1 hour), research ethics and fidelity assessments (2.5 hours), and health information privacy (1 hour).

Measures

Except for the student demographic information, which was provided by the school administrators, the students completed each of the following measures using paper copies of each assessment individually during pre- or post-test. An ALLY facilitator read each question aloud and provided clarification for questions and answer options. The students marked their answers to each question. All questionnaires were entered into Research Electronic Data Capture (RedCap; version 11.0.3) by a research assistant and checked by a research staff.

Student Demographics

The school administrators provided the students' demographics (i.e., age, sex, and race).

Resilience - 17-item Child and Youth Resilience Measure (CYRM-R; Jefferies et al., 2019)

This survey assessed children and adolescents' personal, relational, and overall resilience. Responses ranged on a 3-point scale from "not at all" to "a lot". The CYRM-R has high internal consistency (Cronbach's alpha = 0.82) and has been validated in children (5-9 years) and youth (11-23 years). Further, it is an adapted tool used in culturally diverse populations (Jefferies et al., 2019).

Self-Efficacy - The 24-item Self-Efficacy Questionnaire for Children (Muris, 2001)

The survey assessed three domains of self-efficacy: (1) relational, (2) educational, and (3) emotional. Each item is compiled on a 5-point Likert scale extending from "not at all" to "very well." A total self-efficacy score can be obtained by summing across all items. This scale has high internal consistency (Cronbach's alpha = 0.88) for use among adolescents aged 12-19 years (Muris, 2001).

Mood - 8-item Patient-Reported Outcome Measurement Information System (PROMIS) Emotional Distress Anxiety and Depressive Symptoms Scales (Irwin et al., 2010)

These surveys assessed anxiety and depression symptoms. The PROMIS responses follow a 5-point scale (from "never" to "almost always"). The surveys ask about depressive symptoms such as "I felt like I couldn't do anything right", and anxiety symptoms such as "I worried about what could happen to me". The survey has high internal consistency (Cronbach's alpha = 0.85) in children aged 8-17 years (Irwin et al., 2010).

Physical Activity - 8-item PROMIS Pediatric Physical Activity Self-Report Measure (Tucker et al., 2014)

This questionnaire measured the child's physical activity experienced in the previous 7 days. This tool has been validated in children and adolescents (5-18 years). Five possible response options range in value from 1 to 5. The response options are "No days," "1 day", "2–3 days", "4–5 days", "6–7 days", and to calculate the total raw score with all questions answered, the values of the response to each question will be summed. The lowest possible raw score is 8, and the highest possible raw score is 40. The tool has good test-retest reliability (ICC) of 0.66 (Tucker et al., 2020).

Analytic Approach

All statistical analyses were conducted in R (4.1.2) and R-Studio (version 4.1.1.21). Linear mixed effects regressions included random effects of students nested within ALLY facilitator and Time (pre-and post-test) nested within students. Fixed effects of time (within-subjects factor) and Group (between-subject factor) were used to examine differences from pre-test to post-test, comparing the ALLY and control groups. Post-hoc analyses were conducted to decompose significant main effects and interactions. The alpha level was set at $p < .05$.

The following linear mixed effect model structure was used to address hypotheses 1-3, where DV is the key dependent variable, Group (ALLY vs. Control), and Time (pre-test vs. post-test).

DV ~ Group * Time + (1 + Time | subject) + (1 + subject | facilitator)

The following linear mixed effects model structure was used to address hypothesis 4, where DV is PROMIS Anxiety or PROMIS Depression scores, Group (ALLY vs. Control), Time (pre-test vs. post-test), and the Mediators are CYRM or SEQ scores.

DV ~ Group * Time + Mediator + (1 + Time | subject) + (1 + subject | facilitator)

Mediation was determined based on a significant difference in the model fit statistics with and without each of the mediators included (using an analysis of variance).

Sample Size Determination

Based on the results from Sabin et al. (2021), we hypothesized a similar effect of the ALLY program on self-efficacy ($g = 0.6$; medium effect), anxiety ($g = -0.70$; medium effect), and depression ($g = -0.3$; small effect). G*Power 3.1.9.6 software was used to compute the estimated sample size needed given a medium effect ($f = 0.25$). Based on an alpha of .05, two groups, two repeated measures, a correlation among repeated measurements of 0.5, and a non-sphericity correction of 1, 54 participants in total were required. A sample of 110 participants resulted in a post-hoc achieved power of 0.999 for a medium effect size ($f = 0.25$).

Results

Table 4.5 provides the means, standard deviations, and *p*-values for the ALLY and control groups for each dependent variable for baseline (pre-intervention), follow-up (post-intervention), and change from pre- to post-intervention. NOTE: the *p*-values were computed for independent samples and paired *t*-tests based on the unadjusted raw scores for each variable (without adjustments for multiple comparisons). The key statistical methods are provided for the linear mixed effects regressions below.

Table 4.5

Means and Standard Deviations and p-values for Each Dependent Variable by Group (Control/ALLY)

	Control Means (SD)	ALLY Means (SD)	*p*-value
Baseline (pre-intervention)			
Resilience	**46.32(2.96)**	**44.85(3.92)**	**0.04**
Self-Efficacy	80.62(16.09)	79.76(15.93)	0.79
Depression	50.61(11.47)	53.46(10.58)	0.19
Anxiety	54.42(10.17)	55.64(8.56)	0.51
Physical Activity	49.74(7.93)	49.72(6.80)	0.99
Psychological Stress	55.86(10.31)	57.92(8.68)	0.27
Follow-up (post-intervention)			
Resilience	**46.52(3.24)**	**45.00(4.09)**	**0.04**
Self-Efficacy	83.24(15.81)	81.85(17.59)	0.68
Depression	51.42(12.79)	52.23(10.39)	0.72
Anxiety	53.47(11.14)	54.75(10.27)	0.55
Physical Activity	50.18(7.72)	50.43(6.59)	0.86
Psychological Stress	55.30(12.05)	55.62(9.94)	0.88
Change (pre- to post-intervention)			
Resilience	-0.20(1.98)	-0.15(2.93)	0.91
Self-Efficacy	-2.62(11.92)	-2.09(10.69)	0.81
Depression	-0.81(7.86)	1.23(7.79)	0.19
Anxiety	0.94(6.90)	0.89(7.66)	0.97
Physical Activity	-0.44(7.45)	-0.71(5.87)	0.83
Psychological Stress	0.57(6.40)	**2.31(7.08)**[A]	0.19

Note. [A] = Pre>Post-Test = $p < 0.05$; [B] = Pre<Post-Test = $p < 0.05$

For all linear mixed effects analyses the random effect of subject nested within facilitator and time nested within subject were not significant and removed from all models. A random intercept of time and a random intercept of subject were significant. These random intercepts were included in the final models for each dependent variable.

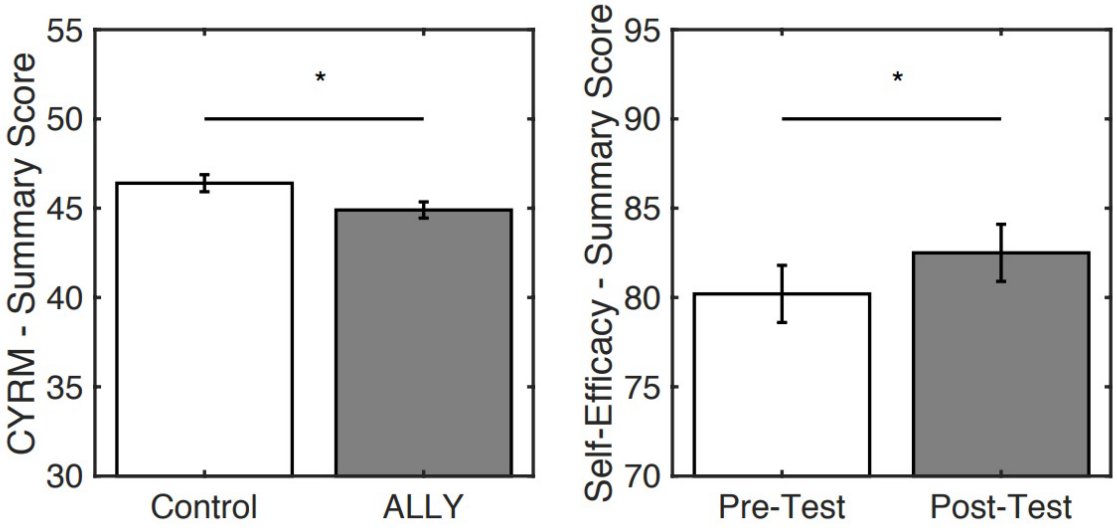
Hypothesis 1: The Effect of ALLY on Resilience and Self-Efficacy

For resilience, a significant Group main effect (F (1,105) = 5.12, p = .03) but no Time or Group x Time interactions were observed (p > .05 for both). Post-hoc follow-up of the Group

main effect revealed that the controls had higher resilience compared to the ALLY group regardless of time (T (105) = 2.26, p = .03*;* Figure 4.1).

Figure 4.1

Left. Mean Estimated CYRM Summary Scores (Resilience) and Standard Errors by Group Accounting for All Fixed and Random Effects; Right. Estimated Self-Efficacy Summary Scores and Standard Errors by Time (Pre/Post) Accounting for All Fixed and Random Effects



Note. * = $p < .05$

For self-efficacy, there was a Time main effect (F (1,105) = 4.56, p = .04), but no Group main effect or Group x Time interaction ($p > .05$ for both). Post-hoc follow-up of the time main effect revealed that all participants increased self-efficacy from pre- to post-test regardless of group (T (105) = -2.14, p = .04; Figure 4.2, right).

Hypothesis 2: The Effect of ALLY on Depression and Anxiety

For depression, no Group, Time, or Group x Time interactions were observed ($p > .05$ for all). Similarly, for anxiety, no Group, Time, or Group x Time interactions were observed ($p > .05$ for all).

Hypothesis 3: The Effect of ALLY on Physical Activity

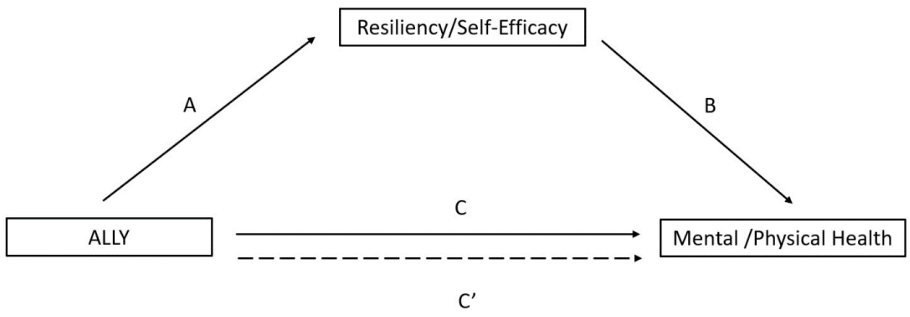
For physical activity, no group, time, or group x time interactions were observed ($p > .05$ for all).

Hypothesis 4: The Mediation of the Effect of ALLY on Mental/Physical Health by Resilience/Self-Efficacy

Figure 4.2 depicts the mediation analysis. Table 4.6 provides all path coefficients for the mediation analyses for each dependent measures and mediators. Consistent with Hypothesis 1, the Path A coefficients (ALLY to resilience or self-efficacy) were not significant. Compared to controls, ALLY did not increase resilience or self-efficacy from pre- to post-test. Consistent with Hypotheses 2 and 3, the Path C coefficients (ALLY to depression, anxiety, and physical activity) were not significant. Compared to controls, ALLY did not increase mental or physical health from pre- to post-test.

Figure 4.2

Mediation Model



Note. Figure 4.2 shows the mediation model depicting the effects of resilience and self-efficacy on the effect of the ALLY program on mental and physical health. 'A' = effects of the ALLY program on resilience and self-efficacy. 'B' = the effects of resilience and self-efficacy on mental and physical health. 'C' = the direct effects of the ALLY program on mental and physical health. C' = the mediating effects of resilience and self-efficacy on the ALLY program intervention effects on mental and physical health.

Table 4.6

Mediation Models for ALLY, Resilience, and Mental Health (Depression & Anxiety)

Variable/Path	Estimate (ß)	Standard Error	*p*
ALLY- Resilience – Depression			
Path A	-0.03	0.25	> .05
Path B	**-1.43**	**0.19**	**< .001**
Path C	-1.02	0.76	> .05
Path C'	-1.06	0.79	> .05
ALLY – Resilience – Anxiety			
Path A	-0.03	0.25	> .05
Path B	**-0.86**	**0.18**	**< .001**
Path C	0.03	0.71	> .05
Path C'	0.00	0.72	> .05

ALLY to Depression via Resilience

Path B (resilience on depression) was significant (β = -1.43, *SE* = .19, $p < .001$). For every 1-unit increase in resilience there is a 1.4-unit reduction in depression. Path C' was not significant (β = -1.06, *SE* = .79, $p > .05$). Although there was a significant inverse relationship between resilience and depression, compared to controls, ALLY did not result in lower depression from pre- to post-test after accounting for resilience.

ALLY to Depression via Self-Efficacy

Path B (self-efficacy on depression) was significant (β = -0.24, *SE* = .04, $p < .001$). For every 1 unit increase in self-efficacy there was a 0.24-unit reduction in depression. Path C' was not significant (β = -1.08, *SE* = .79, $p > .05$). Although there was a significant inverse relationship between self-efficacy and depression, compared to controls, ALLY did not result in lower depression from pre- to post-test after accounting for self-efficacy.

ALLY to Anxiety via Resilience

Path B (resilience on anxiety) was significant. (β =-0.86, *SE* = .18, $p < 0.001$). For every 1 unit increase in resilience there was a 0.86-unit reduction in anxiety. Path C' was not significant (β = .004, *SE* = .72, $p > .05$). Although there was a significant inverse relationship between resilience and anxiety, compared to controls, ALLY did not result in lower anxiety from pre- to post-test after accounting for resilience.

ALLY to Anxiety via Self-Efficacy

Path B (self-efficacy on anxiety) was significant (β = -0.20, *SE* = .04, $p < .001$). For every 1 unit increase in self-efficacy there was a 0.20-unit reduction in anxiety. Path C' was not significant (β = -0.02, *SE* = .73, $p > .05$). Although there was a significant inverse relationship between self-efficacy and anxiety, compared to controls, ALLY did not result in lower anxiety from pre- to post-test after accounting for self-efficacy.

ALLY to Physical Activity via Resilience

Path B (resilience on physical activity) was not significant (β =-0.003, *SE* = .15, $p > .05$). For every 1 unit increase in resilience there was a 0.003-unit increase in physical activity. Path

C' was also not significant (β = .14, *SE* = .65, $p > .05$). Compared to controls, ALLY did not result in greater physical activity from pre- to post-test after accounting for resilience.

ALLY to Physical Activity via Self-Efficacy

Path B (self-efficacy on physical activity) was significant (β = .10, *SE* = .03, $p = .002$). For every 1 unit increase in self-efficacy there was a 0.10-unit increase in physical activity. Path C' was also not significant (β = .17, *SE* = .64, $p > .05$). Although there was a positive relationship between self-efficacy and physical activity (F (1, 190.82) = 10.28, $p = .002$), compared to controls, ALLY did not result in greater physical activity from pre- to post-test after accounting for self-efficacy.

Table 4.7

Mediation model showing relationship between ALLY, self-efficacy, and mental health (depression & anxiety)

Variable/Path	Estimate	Standard Error	*p*
ALLY- self-efficacy – depression			
Path A	-0.26	1.10	> .05
Path B	**-0.24**	**0.04**	**< .001**
Path C	-1.02	0.76	> .05
Path C'	-1.08	0.79	> .05
ALLY – self-efficacy – anxiety			
Path A	-0.26	1.10	> .05
Path B	**-0.20**	**0.04**	**< .001**
Path C	0.03	0.71	> .05
Path C'	-0.02	0.73	> .05

Table 4.8

Mediation model showing relationship between ALLY, self-efficacy, resilience, and physical health

Variable/Path	Estimate	Standard Error	*p*
ALLY- resilience – physical activity			
Path A	-0.03	0.25	> .05
Path B	-0.00	0.15	> .05
Path C	0.14	0.65	> .05
Path C'	0.14	0.65	> .05
ALLY – self-efficacy – physical activity			
Path A	-0.26	1.10	> .05
Path B	**0.10**	**0.03**	**< .05**
Path C	0.14	0.65	> .05
Path C'	0.17	0.64	> .05

Discussion

The aim of this study was to determine the efficacy of the modified ALLY program on resilience and self-efficacy, mental health (i.e., anxiety and depression), and physical health (i.e., physical activity). Another aim of the study was to determine if changes in resilience and self-efficacy mediate changes in mental health outcomes for program participants. This study is an important first step to determine if universal, school-based programs of this type mitigate mental health problems in at-risk and underserved populations like those included in the present study (African American/Black students from rural, low-income communities). The changes to the original ALLY program resulted in more accurate measurement of program outcomes for this population, greater content knowledge by students and improved fidelity in the program delivery. With that said, our hypotheses were not supported. Compared to controls, the modified ALLY program did not improve resilience, self-efficacy, mental health, or physical health in this population. Although relationships between resilience and self-efficacy, depression or anxiety were observed, after controlling for resilience and self-esteem there was no relationship between ALLY program participation and changes in mental health. Lastly, despite the observed relationship between self-efficacy and physical activity, there was no relationship between resilience and physical activity. Further, there was no relationship between ALLY program participation and changes in physical activity after controlling for these variables.

The present study builds upon previously implemented health promotion interventions that incorporate principles of CBT to improve mental and physical health (Gillham et al., 2007; Hoying & Melnyk, 2016). For example, Gillham et al. (2007) implemented a universal CBT-based resilience program in predominantly white middle school children (12 sessions; 1080 minutes total) and found moderate effect sizes for depression. Hoying and Melnyk (2016) addressed the issue of a lack of diverse sample by implementing a universal CBT-based

intervention (15 weeks; 900 minutes total) aimed to increase healthy lifestyle beliefs, physical activity, and self-concept in low-SES 6th -grade students (58% African American). Moderate to large effect sizes were reported for anxiety and physical activity. The present study also incorporated aspects of CBT into the intervention but employed a much lower intervention dose (i.e., 6 sessions; 180 minutes). It is unclear if the lack of significant results were due to the difference in intervention dose, other aspects of the intervention, or the study population.

The ALLY program also incorporated mindfulness and MI, which have been shown to improve mental health in youth (Dilallo & Weiss, 2009; Henry et al., 2020; Sapthiang et al., 2019). For example, Henry et al. (2020) implemented a MI program at an alternative school for eleven elementary and 28 secondary school students (10 -12 sessions; 300-360 minutes total). The students receiving MI intervention had significant reductions in student self-report of internalizing and emotional symptoms with moderate to large effect sizes. Additionally, a systematic review was conducted by Felver et al. (2016) on school-based mindfulness programs including 28 studies. The authors found that students showed improvements in resilience, mental health (e.g., depression and anxiety), aggression, and coping skills. The studies included in the systematic review had doses ranging from 75-2160 minutes and included students ranging in age from 5 -17 years. The present findings are not consistent with these previous studies examining mindfulness and MI as no intervention effect was observed and may be due intervention or sample differences. Although it has been suggested that combining CBT, mindfulness, and MI would yield better mental health outcomes, the present study did not observe such an effect (Domitrovich et al., 2010).

Although the hypotheses were not supported statistically, visual inspection of the means and standard errors by group and time (supplementary figure) indicate that the pattern of results

was in the expected direction. These results suggest the possibility that a greater dose of the intervention (i.e., more than six sessions) may yield statistically significant results consistent with our hypotheses. It is important to note that the hypotheses for this study were based on previous research with different sample characteristics. Given that this is the first study to include youth from a low-income, rural, and predominantly Black community, future studies are needed to determine if a greater dose of the intervention indeed yields significant improvements in resilience, self-efficacy, depression, anxiety, and physical activity. It is also possible that additional changes in program content and delivery are needed to result in robust changes in these outcomes.

There were several unexpected findings. First, in contrast with previous studies, our control group had higher resilience compared to the ALLY group regardless of time. Given that the participants were randomized into the intervention or control groups, this group difference was likely due to chance. Second, self-efficacy exhibited a significant change from pre-test to post-test regardless of group. Although previous interventions with a similar design exhibited a significant increase in self-efficacy (Lee et al., 2021; Sabin et al., 2021), these previous studies did not include a control group. Thus, it is not clear if an increase in self-efficacy was a function of time (e.g., over the school semester). It is possible that a much higher dose of the ALLY intervention is needed to distinguish the groups over time. Third, there was no effect of the ALLY program on anxiety or depression. This is in contrast with a previous study that found a decrease in anxiety due to participation in a program that served as the basis for the present intervention (Sabin et al., 2021). Although the previous study did not include a control group, it is also possible that a much higher dose of the ALLY intervention is needed to bring about a reduction in anxiety or depression in this population.

Although the mediation analysis did not reveal that changes in resilience or self-efficacy underlie differences in mental or physical health, there was a relationship between these variables. Specifically, a significant inverse relationship between resilience and self-efficacy and mental health (depression/anxiety) were observed. These results are consistent with that of other authors who showed inverse relationships between resilience and mental health disorders (Beutel et al., 2017; Hjemdal et al., 2011). Specifically, Beutel et al. (2017), found that individuals with greater resilience and self-efficacy are less likely to have mental health issues. This study included a large community sample ($N = 2508$) that ranged in age range from 14 to 92 years,16% of which reported significant childhood adversity (Beutel et al., 2017). Hjemdal et al. (2011) found that adolescents ($N = 307$, mean age 16.4 years) with high levels of resilience had a reduced the likelihood of developing mental health problems such as anxiety and depression. The present study confirms the relationship between resilience or self-efficacy, and mental health in an understudied population of at-risk youth.

There was no relationship between resilience and PA and no difference in PA resulting from the modified ALLY program. The lack of relationship between resilience and PA is inconsistent with results from Gerber et al. (2012) who found that high school students ($N = 284$; mean age = 18.3 years) with higher levels of resilience, exhibit higher levels of physical activity, as well as mental and physical health. Similarly high school students with higher physical activity levels also exhibit higher resilience scores (Gerber et al., 2012). The lack of improvement in PA resulting from the ALLY program is also inconsistent with previous school-based studies that used health promotion programs to improve physical health outcomes (Hoying et al., 2016; Sallis et al., 1997). Specifically, Hoying et al. (2016) conducted a school-based single group pre-test and post-test design using the COPE Healthy Lifestyles TEEN program in

8th-grade students (N = 102; 13-14 years) in a rural community. Students were enrolled in a required health education class (15-sessions; 900 minutes) and were more physically active after the program with small effect size improvements in healthy lifestyle behaviors (Hoying et al., 2016). Additionally, a school-based physical education program (SPARK) led to small effect size improvements in physical activity in elementary students (N = 1538). The intervention included fitness activities such as aerobic dance, jump rope, and jogging (37 sessions; 2960 minutes) to build skills such as goal setting, self-instruction, and problem-solving (Sallis et al., 1997). Again, it is possible that the lack of change in PA or relationship between resilience and PA may be due to the much smaller dose of the intervention. In particular, only about 45 minutes of the ALLY intervention specifically targeted improving PA. The discrepancies may also be due to differences in study samples.

In addition, the mediation analysis revealed a positive relationship between self-efficacy and physical activity. Others have shown that increasing self-efficacy through psychological interventions can improve physical health (Ashford et al., 2010; Darker et al., 2010). For example, a systematic review with 27 studies on adults found that psychological interventions improve self-efficacy for physical activity with small effects and that self-efficacy mediates the relationship between physical health literacy and physical health (Ashford et al., 2010). Another systematic review included 22 studies of youth and adults and found that changes in physical health literacy have been found to improve physical activity and health (Buja et al., 2020). Although the present study found a positive relationship between self-efficacy and PA, it was not the case that *changes* in self-efficacy mediates changes in PA. Indeed, although the modified ALLY program is designed to increase self-efficacy and thereby improve PA, there was no difference from pre- to post-test for either measure.

Limitations and Future Directions

Although our study had the power to detect expected medium effect sizes it was underpowered to detect small effects. Future studies are needed with much larger samples of the present population to provide evidence of the efficacy of the modified ALLY program given the likelihood of small effect sizes. Further, research has shown differences between individuals from urban low SES communities and rural low SES communities (Amato & Zuo, 1992). The present study was carried out in a rural low SES community. Therefore, results may not generalize to urban low SES communities or rural low SES communities with different racial/ethnic characteristics. Indeed, the present study included few Hispanics and other races, and therefore this study may not be generalizable to other racial and ethnic minoritized groups from low SES communities. Future studies are needed to replicate the results of this study in a more diverse sample with more racial and ethnic minoritized groups.

The majority of the facilitators were Caucasian undergraduates from predominantly high-SES backgrounds. Training to enhance cultural competency and a "get to know you" session to build rapport before the start of the intervention were added. However, program content may be better accepted by students if the program was delivered by community members with the same racial or SES background (Griner & Smith, 2006). Additional funding would be necessary to hire community members to serve as program facilitators. Future studies employing a greater number of community members as facilitators would be needed to determine if ALLY program efficacy is greater when delivered by those of similar racial or SES backgrounds.

Chapter 5 – General Discussion

The modified ALLY program addressed many barriers that limit the delivery of mental health interventions in underserved communities at elevated risk of mental health disorders and who are disproportionately more likely to receive mental health care entirely from school (Ali et al., 2019). First, compared to the high cost of existing mental health programs that require delivery by mental health professionals or teachers/staff that have received additional professional development, the present program had much lower costs because trained facilitators (i.e., university students and community members) delivered the program. Second, the program is universally delivered to all students and includes students with a full range of mental health symptoms. This is important as those with sub-clinical levels of mental health symptoms may not be included in targeted programs for those with diagnosed mental health disorders. The universal approach prevents stigmatization and promotes better acceptability among stakeholders and participants, thus increasing participation rates. Third, the modifications to the original ALLY program were based on a pilot program from a similar racial, economic, and geographic region serving students from similar low-resource schools. These modifications ensured the program's acceptability for the target population, accurate measurement of program outcomes for this population, and enhanced fidelity across ALLY facilitators. Thus, these modifications enhanced the internal and external validity of the study.

This line of research is important because it represents the steps needed to ensure the appropriateness, feasibility, and efficacy of a previously delivered program for an at-risk and underserved population. Given the dearth of previous research on universal programs into improving mental health outcomes in low income, rural and predominantly Black communities, these steps were necessary to create programs that may be effective in the future. Indeed, our first study showed that the ALLY program was feasible and acceptable but required substantial

modifications to become more appropriate for Black and low-income communities. Our second study demonstrated that the modified ALLY program could be applied in multiple Title I schools with greater fidelity, more accurate measurements, and salient content for the target population. However, based on the measured outcomes, additional modifications will be needed to differentiate the intervention and control groups over time and result in statistically significant improvement in resilience, self-efficacy, mental and physical health. The purpose of this chapter is to provide additional details regarding logistics and implementation in order for future researchers to replicate and extend this work. The chapter will elaborate on lessons learned and recommendations to further enhance the ALLY program for minoritized youth.

The following two recommendations are based on the experience from Study 1 (Chapter 3). First, although we were able to ensure 98% completion in Study 1 (Chapter 3) and 96% in Study 2 (Chapter 4), considerable flexibility on the part of the coordinator and health coaches was needed. It is important to note that chronic absenteeism occurs (at a rate of 38%) in the pilot school and in other Title I schools in the region (based on the Alabama State Department of Education Report Card). In addition to student absences, there were several unanticipated disruptions to the schedule due to testing and other school activities. ALLY facilitators should plan for at least 2-3 additional hours per week for make-up sessions. In addition, study coordinators should discuss the need for make-up sessions with school administrators and teachers to reduce classroom disruptions to accommodate make-up sessions. Further, appropriate space must be available for these sessions to ensure fidelity and consistency for students/facilitators.

Second, future studies will also benefit from enhanced communication between the study coordinators, school administrators, and classroom teachers. Teachers, administrators, and

facilitators need to be involved in a pre-intervention meeting in which the goals, logistics, and outcomes are described and any questions regarding the intervention are answered. Weekly communication via email and paper formats to the teachers will help reduce classroom disruptions when students are pulled out of class for regularly scheduled and make-up sessions. It would also be beneficial to schedule 30-minute weekly debriefing sessions with the ALLY facilitators to reiterate expectations, scheduling, program delivery, and address issues. Upon completion of the intervention, meetings with teachers, administrators, and facilitators should be scheduled to describe findings and to express gratitude for their support.

The following four recommendations are based on the experiences from Study 2 (Chapter 4). Future studies evaluating the efficacy of the modified ALLY program would benefit from the following adjustments to ensure smooth delivery. First, to recruit new schools, meetings with school district superintendents were needed in addition to meetings with each school principal. These meetings should be scheduled at least two months in advance to provide sufficient time for study approval. Second, Schools A and B were located a further distance from the university; transportation time should be included in the weekly hourly commitment and incorporated into facilitator schedules. Recruitment of community members will reduce logistical constraints regarding facilitator schedules and transportation barriers. Recruitment of community members may also decrease the time needed to build rapport between facilitators and students. Third, greater communication with parents is needed to ensure understanding of the study aims, content, and expected outcomes. Parent buy-in may also reduce absenteeism during the study period, thus reducing the need for make-up sessions. Parent engagement for Title I schools is a known challenge for school administrators given low parent education, parents working multiple jobs, multigenerational households/caregivers, limited internet/computer access at home, etc.

Therefore, multiple forms of communication - physical letters, emails, notifications via online parent portal, and in-person formal and informal meetings - would be needed. Lastly, additional incentives (e.g., school supplies, snacks, etc.) provided to teachers and school administrators would increase buy-in and cooperation during the program. Taken together, these adjustments may facilitate program delivery and ensure that all constituents are considered during planning and implementation of the modified ALLY program.

This program of research represents an important first step in examining the efficacy of the ALLY program for use with minoritized, at-risk students from underserved communities. Beyond the recommendations for future research described in Chapters 3 and 4, future studies are needed to address the following remaining knowledge gaps. First, how many sessions or what additional changes to program content are needed to result in immediate (pre- to post-test) and long-term changes (e.g., 3- or 6-months post-intervention)? Second, what program components result in changes in resilience, self-efficacy, mental and physical health outcomes (e.g., CBT, MI, mindfulness)? In the present form, it is not possible to differentiate the contribution of each component. The program would need to be restructured to enable systematic investigation of EACH component with multiple (short) evaluations administered throughout the program. Third, what is the impact of including teachers, administrators, and parents into the intervention design (socioecological perspective). Including these key constituents into the program design may foster greater understanding and incorporation of program components into everyday life. For example, teachers can incorporate the mindfulness exercises into the classroom or parents can work with students to complete homework exercises.

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Appendices

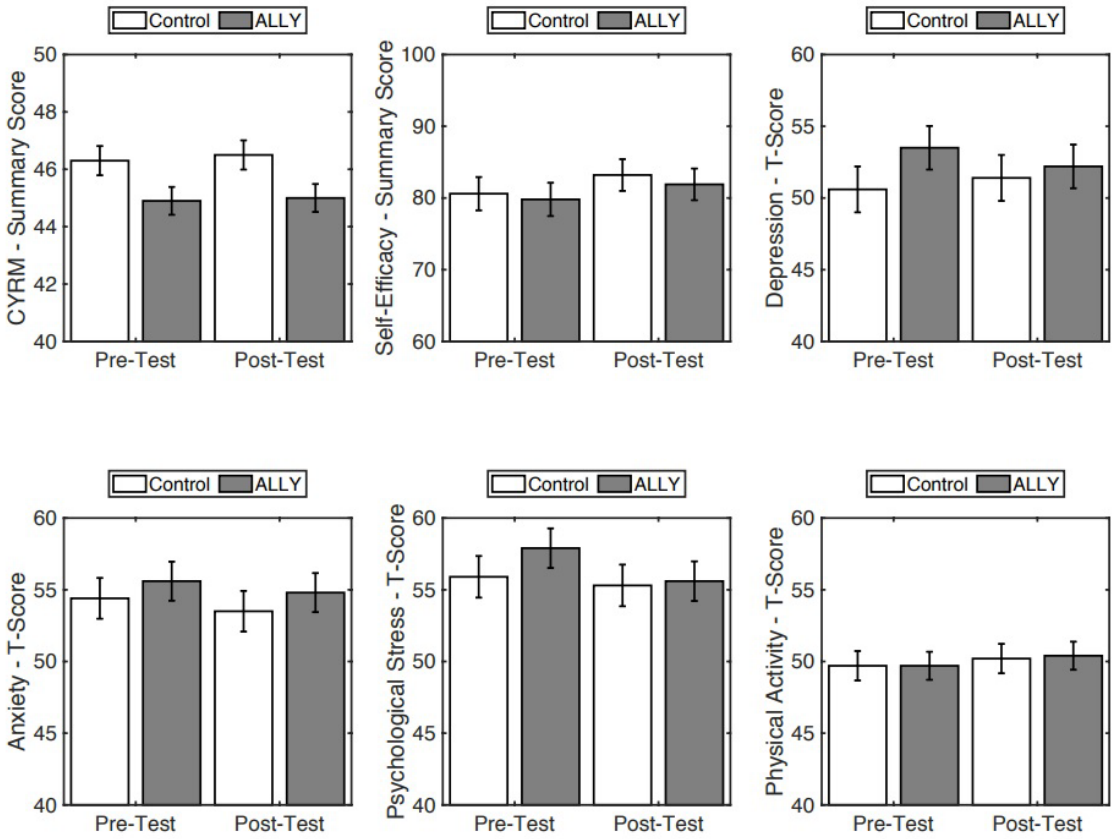
APPENDIX A- Supplemental Data

Although there were no Group by Time interactions for any dependent variable, the overall pattern of changes from pre-test to post-test for the ALLY group were in the expected

direction (Figure 4.3). There was a reduction in psychological stress in both intervention and control group over time from pre-test to post-test. In addition, there was a positive relationship between psychological stress and mental health (anxiety and depression) but not physical health.

Figure 4.3

Mean Estimated Values for Each Dependent Variables By Group (ALLY/Control) and Time (Pre-/Post-Test) Accounting for All Fixed and Random Effects



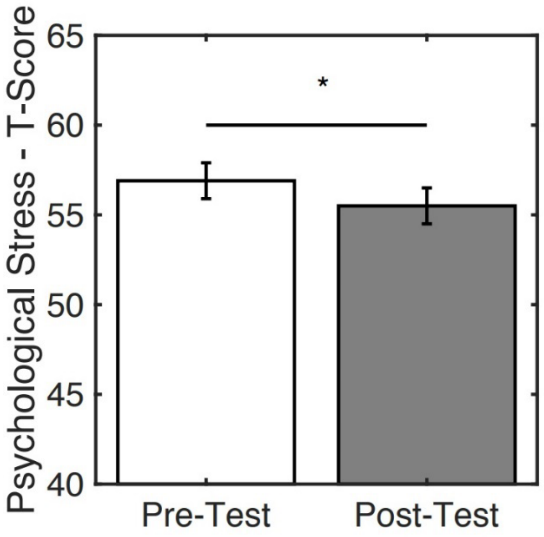
Note. Error bars represent standard errors

In addition, we examined psychological stress using the same LMER approach and observed a time main Effect (F (1,105) = 4.73, p = .03) but no group or group x time interaction

$p > 0.05$ for both). Post-hoc follow-up revealed that all participants had lower psychological stress from pre-test to post-test, regardless of group (T (105) = 2.17, p = .03).

Figure 4.4

Time Main Effect of Psychological Stress



Note. Error bars represent standard errors

ALLY to Depression via Psychological Stress

Path A (ALLY on psychological stress) was not significant. Compared to controls, ALLY did not result in lower psychological stress from pre- to post-test. (β = -.87, SE = .66, $p > .05$). Path B (psychological stress on depression) was significant. (β = .85, SE = .05, $p < .001$). For every 1 unit increase in psychological stress there is a 0.85 unit increase in depression. Path C (ALLY on depression) was also not significant (β = -1.02, SE = .76, $p > .05$). ALLY did not result in lower depression from pre- to post-test compared to controls. Path C' was also not significant (β = -.28, SE =0.75, $p > .05$). Although there was a statistically significant positive relationship between psychological stress and depression (F (1,148.64) = 301.85, p <2e-16),

compared to controls, ALLY did not result in lower depression from pre- to post-test after accounting for psychological stress.

ALLY to Anxiety via Psychological Stress

Path A (ALLY on psychological stress) was not significant. Compared to controls, ALLY did not result in lower psychological stress from pre- to post-test (β = .87, *SE* = .66, $p > .05$). Path B (psychological stress on anxiety) was not significant. (β = .85, *SE* = .05, $p < .001$). For every 1 unit increase in psychological stress there is a 0.85 unit increase in anxiety. Path C (ALLY on anxiety) was also not significant (β = -1.02, *SE* = .76, $p > .05$). ALLY did not result in lower anxiety from pre- to post-test compared to controls. Path C' was also not significant (β = -0.28, *SE* = 0.75, $p > .05$). Although there was a positive relationship between psychological stress and anxiety that approached statistical significance (F (1,200.87) = 3.8416, $p = 0.05$), compared to controls, ALLY did not result in lower anxiety from pre- to post-test after accounting for psychological stress.

ALLY to Physical Activity via Psychological Stress

Path A (ALLY on psychological stress) was not significant. Compared to controls, ALLY did not result in lower psychological stress from pre- to post-test (β = .87, *SE* = .66, $p > .05$). Path B (psychological stress on physical activity) was not significant (β = .05, *SE* = .05, $p > .05$). For every 1 unit increase in psychological stress there is a 0.05 unit increase in physical activity. Path C (ALLY on physical activity) was also not significant (β = .14, *SE* = .65, $p > .05$). ALLY did not result in greater physical activity from pre- to post-test compared to controls. Path C' was also not significant (β = .19, *SE* = .65, $p > .05$). ALLY did not result in greater PA from pre- to post-test after accounting for psychological stress.

Table 4.9

T-Statistics, Degrees of Freedom (DF), and p-values Comparing Pre-test and Post-Test for Each Dependent Variable by Group (Control/ALLY)

	T(DF)	*p*-value
Controls		
Resilience	-0.71(49)	0.48
Self-Efficacy	-1.54(49)	0.13
Depression	-0.72(49)	0.48
Anxiety	0.96(49)	0.55
Physical Activity	-0.41(49)	0.68
Psychological Stress	0.62(49)	0.54
ALLY		
Resilience	-0.36(54)	0.72
Self-Efficacy	-1.44(54)	0.16
Depression	1.16(54)	0.25
Anxiety	0.85(54)	0.4
Physical Activity	-0.89(54)	0.37
Psychological Stress	**2.39(54)**	**0.02**

Figure 4.5

Above. Physical Activity by Group (Intervention/Control). Below Psychological Stress by Group (Intervention/Control).

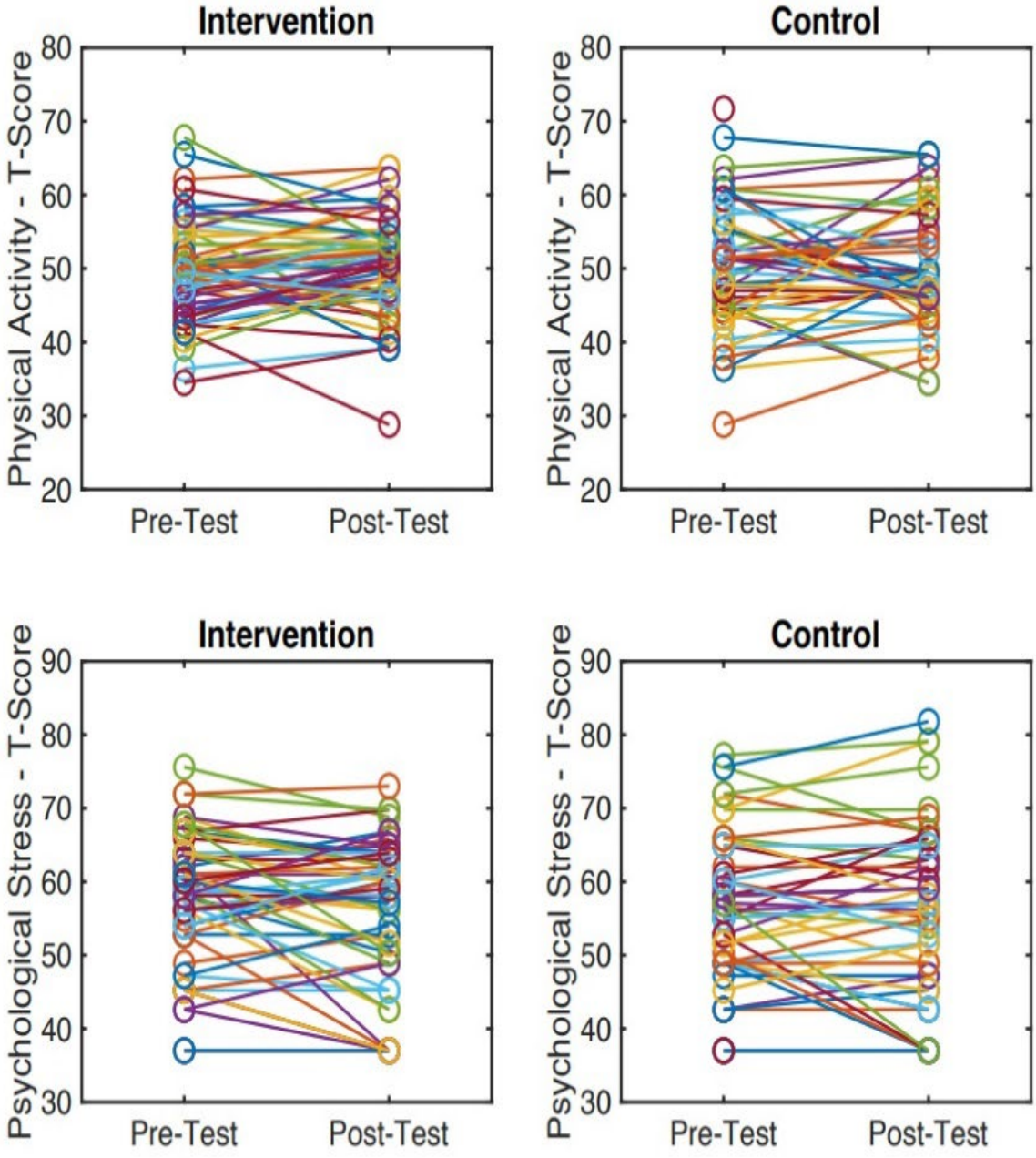


Figure 4.6

Above. Depression by Group (Intervention/Control). Below Anxiety by Group (Intervention/Control)

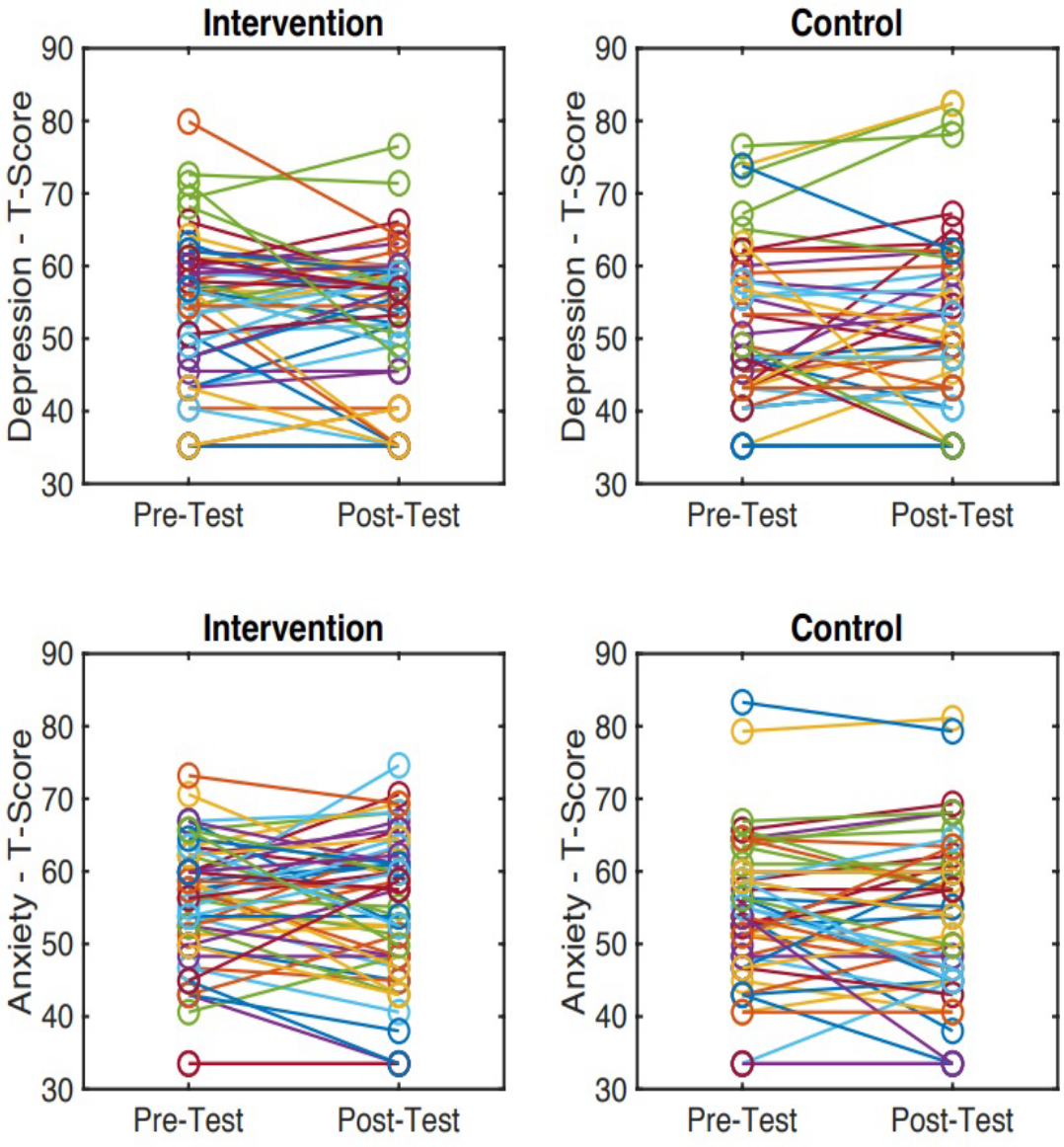
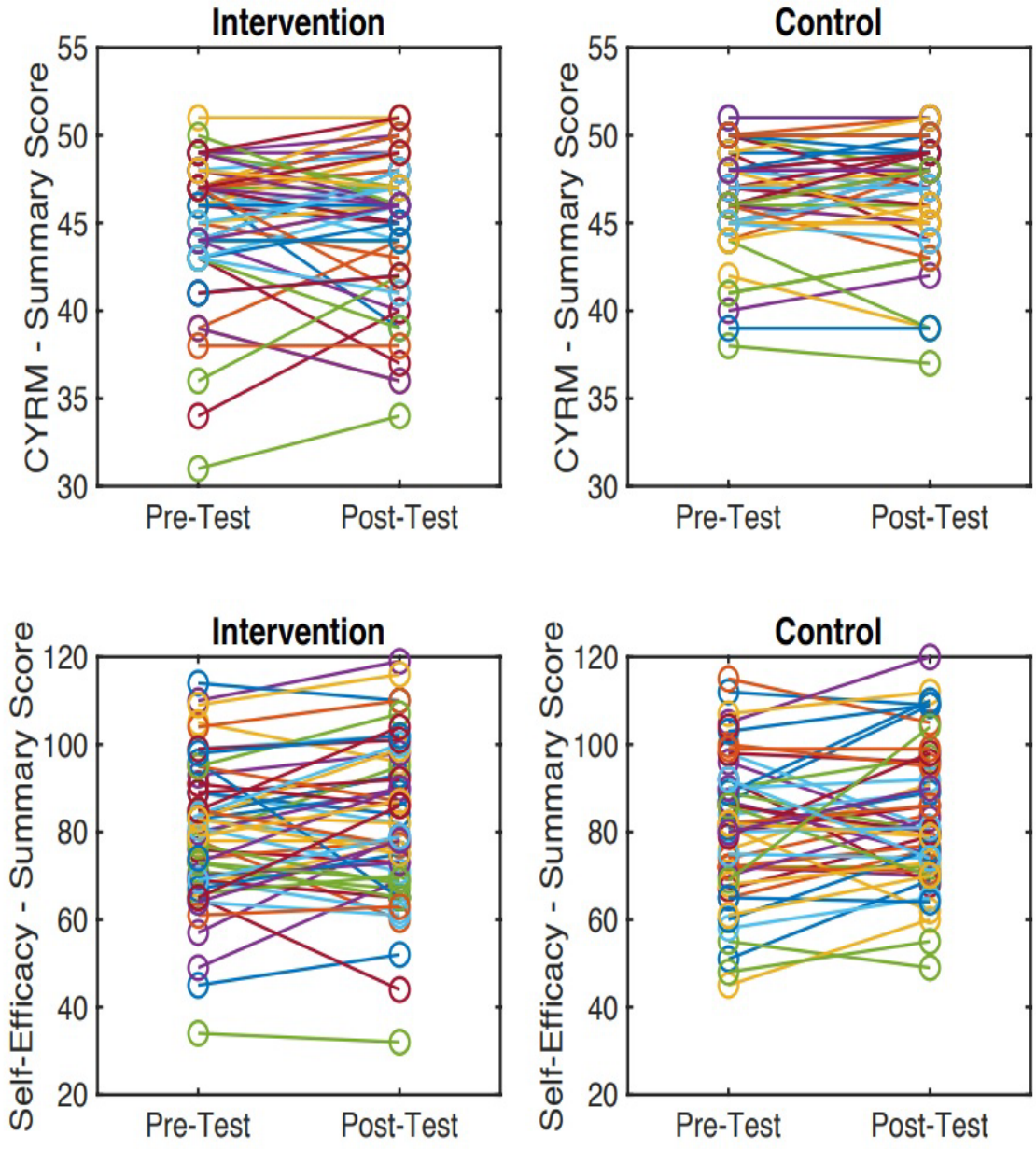


Figure 4.7

Above. CYRM (Resilience) by Group (Intervention/Control). Below. Self-Efficacy by Group (Intervention/Control)



APPENDIX B – IRB Approval

Revised 02/01/2022

AUBURN UNIVERSITY HUMAN RESEARCH PROTECTION PROGRAM (HRPP)

EXEMPT REVIEW APPLICATION

For assistance, contact: **The Office of Research Compliance (ORC)**
Phone: **334-844-5966** E-Mail: **IRBAdmin@auburn.edu** Web Address: **http://www.auburn.edu/research/vpr/ohs**
Submit completed form and supporting materials as one PDF through the IRB Submission Page
Hand written forms are not accepted. Where links are found hold down the control button (Ctrl) then click the link..

1. Project Identification **Today's Date: July 1, 2022**

Anticipated start date of the project: July 1, 2022 Anticipated duration of project: 1 Year

a. **Project Title:** Advocates for All Youth (ALLY) program evaluation

b. **Principal Investigator (PI):** Adefunke DadeMatthews Degree(s): MD Rank/Title: Graduate Student Department/School: School of Kinesiology
Role/responsibilities in this project: Will conduct the secondary data and will draft the manuscripts from these data
Preferred Phone Number: 3347444142 AU Email: aod0006@auburn.edu

Faculty Advisor Principal Investigator (if applicable): Melissa Pangelinan
Rank/Title: Associate Professor Department/School: School of Kinesiology
Role/responsibilities in this project: Supervision for the secondary data analysis and provide feedback on manuscripts.
Preferred Phone Number: 3347444142 AU Email: mgp0020@auburn.edu

Department Head: Mary Rudisill Department/School: School of Kinesiology
Preferred Phone Number: 3348441458 AU Email: rudisme@auburn.edu
Role/responsibilities in this project: NA

c. **Project Key Personnel –** Identify all key personnel who will be involved with the conduct of the research and describe their role in the project. Role may include design, recruitment, consent process, data collection, data analysis, and reporting. (To determine key personnel, see decision tree). *Exempt determinations are made by individual institutions; reliance on other institutions for exempt determination is not feasible. Non-AU personnel conducting exempt research activities must obtain approval from the IRB at their home institution.*

Key personnel are required to maintain human subjects training through CITI. Only for EXEMPT level research is documentation of completed CITI training NO LONGER REQUIRED to be included in the submission packet. NOTE however, **the IRB will perform random audits of CITI training records to confirm** reported training courses and expiration dates. Course title and expiration dates are shown on training certificates.

Name: Jill Kaar Degree(s): **Ph.D.**
Rank/Title: Associate Professor Department/School: Department of Epidemiology
Role/responsibilities in this project: Obtained IRB approval from the University of Colorado, developed the program, collected data, provided oversight for data collection, and will provide oversight on data transfer and analysis for the secondary data analysis proposed.
- AU affiliated? ☐ Yes ☒ No If no, name of home institution: University of Colorado
- Plan for IRB approval for non-AU affiliated personnel? The original data collection for this project received approval from the IRB at the University of Colorado (#21-3790). Dr. DadeMatthews and Dr. Pangelinan were added as collaborators on that protocol.
- Do you have any known competing financial interests, personal relationships, or other interests that could have influence or appear to have influence on the work conducted in this project? ☐ Yes ☒ No
- If yes, briefly describe the potential or real conflict of interest: None
- Completed required CITI training? ☒ Yes ☐ No If NO, complete the appropriate CITI basic course and update

The Auburn University Institutional Review Board has approved this Document for use from 06/27/2022 to ____
Protocol # 22-321 EX 2206