How Exercise Builds Grit to Help ADHD College Students Succeed in School

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Chapter 1: Introduction

How Exercise Builds Grit to Help ADHD Middle Schoolers to Succeed in School

Many students in the public school system are faced with problems of focus due to the mental health diagnosis attention deficit hyperactivity disorder (ADHD). Students with ADHD often have thoughts run through their mind and become hyper stimulated by the environment in a manner that their behavior disrupts the learning environment in their classrooms. These behaviors may result in students with ADHD being labeled as problem children who are more frequently punished than others in the school system (Dodson, 2019). Greater punishments in public schools typically lead to less opportunities to learn and less chances to earn high grades on assignments. ADHD symptoms include more than a lack of focus. Some students may become hyper focused on a project that has nothing to do with the task nor the lesson happening in class. Hyper focus can potentially have similar negative effects as hyper stimulation previously described.

Despite common misconceptions that kids with ADHD are bad, misbehaved, or have parents that do not discipline them, ADHD is a neurological condition (Silver, 2021). According to ADDitude, the reason behind the behavior of kids with ADHD is there is a low level of the neurotransmitter called norepinephrine, which is connected to dopamine (Dodson, 2019). Since norepinephrine is connected so closely to dopamine, the brain has trouble with the reward and pleasure centers that affect four different regions of the brain: frontal cortex, limbic system, basal ganglia, reticular activating system. Deficiencies in the frontal cortex disrupt attention, executive function, and organization. ADHD in the limbic system affects the regulation of emotion and attention. Inattention or impulsivity occurs from short circuiting occurring between inter brain

communication in the basal ganglia region. The following is a list of thirteen symptoms that are used to diagnosis ADHD:

- Short attention span, especially for non-preferred tasks
- Hyperactivity, which may be physical, verbal, and/or emotional
- Impulsivity, which may manifest as recklessness
- Fidgeting or restlessness
- Disorganization and difficulty prioritizing tasks
- Poor time management and time blindness
- Frequent mood swings and emotional dysregulation
- Forgetfulness and poor working memory
- Trouble multitasking and executive dysfunction
- Inability to control anger or frustration
- Trouble completing tasks and frequent procrastination
- Distractibility
- Difficulty awaiting turn

A child with ADHD can have differing behavior than another child with ADHD because different parts of the brain may be affected. There are three versions: inattentive type, hyperactive or impulsive type, combined type (Silver, 2021). It is important that parents, teachers, and school administrators understand that ADHD is a mental diagnosis and are educated on the best ways to teach students that have ADHD.

Exercise has shown its importance with assisting people with mental health diagnosis. Consistent exercise is a necessity for the foundation of a healthy mind and body (Marquie & Baker, 2015). There are many neurological benefits from exercise that keep the mind functioning

along with the body. Here are a few of the many positive outcomes that exercise helps to generate in the brain. The release of hormones breeds an environment for the growth of brain cells (Marquie & Baker, 2015). Exercise releases neurotransmitters such as endorphins, more known as the happy chemical, that brings an instant change of moods (Marquie & Baker, 2015). Exercise promotes plasticity in the brain because of brain cell growth by making new connections between cells in the cortical regions of the brain (Marquie & Baker, 2015). There is an immediate blood flow to the brain along with more oxygen that both helps the functional levels of thinking. Many studies have tested athletes and non-athletes on physical abilities to determine what effects physical abilities have on their brain, intelligence, or memory (MeBler et al., 2018). Most of these studies were short-term, examining the effects of exercise immediately after physical activity took place.

Problem Statement

Exercise and ADHD have been examined together in many studies and typically show correlations that provide evidence that the two variables positively affect each other, or parallels with improvement for the behaviors tested (MeBler et al., 2018). There have been studies with ADHD participants that examine how exercise programs affect their memory (Kwak et al., 2018). Another study compared test grades between athletes diagnoses with ADHD and athletes not diagnosed with ADHD (Marquise & Baker, 2015). Although previous studies have made great progress with research connecting exercise and ADHD, there are a few gaps in previous studies. Some studies ignored external influences such as homelife, relationships, etc. while other studies were unaware of participants sleep, nutrition, or other moderating variables that could potentially alter the outcome of the study.

This study will provide an exercise intervention for students with ADHD and will compare outcomes between students. The outcome examined includes classroom behaviors and class success. There will be three surveys, Pre-Intervention, Daily Intervention, and Post-Intervention, taken to obtain contingency data for each participant. The surveys will ask each participant about their sleep, nutrition, behavior, physical activity, relationships with friends and significant others to document all external effects that could cause further disturbance from student success. This intervention fills the gap in literature by directly studying students with ADHD while mindfully collecting and surveying external factors. This allows for more concise analysis to take place after the intervention on how beneficial the intervention was to build grit and assist students diagnosed with ADHD to become successful in school.

Purpose Statement

The purpose of this intervention study is to test how the theory of grit can be built using exercise to help college students diagnosed with ADHD succeed in school by accessing data between the Pre-Intervention and Post-Intervention survey to access if grit was built through the exercise intervention. Exercise will be the manipulated variable that is used to examine the success of the students in school. This study will control each participant's eating habits or nutrition, sleep habits including amounts by having documentation of each moderating variable that occurred during the four-week intervention. The mediating variables of self-control, determination, class schedules, and number of classes will also be accounted for during the study. There will be approximately ten students with an official diagnosis of ADHD from accredited colleges in the United States of America enrolled in the fall 2021 semester that was previously enrolled in a university during spring 2021 semester. Exercise intervention will be defined as thirty minutes of physical activity led by a physical trainer each morning before the

start of classes during days each participants have class. Success of the student in college will be determined by classroom behavior and classroom success through self-reporting surveys.

Research Questions

The central research questions addressed in this study are as follows:

A) What is the frequency and variation of scores on classroom behaviors for students with ADHD?

B) Does the Grit Theory explain the relationship between exercise and class behavior, controlling for the effects that exercise has for students with ADHD.

C) How does exercise influence the classroom behaviors of students diagnosed with ADHD?

Brief Overview of Theoretical or Conceptual Framework

The theory I will use is the Theory of Grit as a Predictor of Success in Life. It was developed by Angela Duckworth and Lauren Eskreis-Winkler (2015) to predict the success of an individual in life. This theory has been used to study how individuals are able to overcome hardships for long periods of time and reach their full potential. Grit has been used to measure college students' graduation rates, and adolescents' ability to stay in school as well as to overcome temporary depression and other mental diagnoses. This theory indicates that grit is not a fixed trait but can grow in individuals over time. As applied to my study, this theory holds that I would expect exercise to influence good grades and classroom behavior in adult students with ADHD in American universities.

The theory of grit is best suited for my topic because exercise builds the same characteristic traits that are indicators of grit. People who consistently exercise and have high grit share the following traits: self-control, dedication, attention span, resiliency (Duckworth &

Quinn, 2009). Based on previous research of grit, student success has been correlated to higher levels of grit. Grit can be built simultaneously with the exercise benefits, therefore leading to students becoming more successful in school.

Brief Overview to Methodology

In the upcoming methodology section, positionality of the researcher will be discussed, the methodology of the study explained, an explanation of the quantitative experimental design and an introduction into the population target of the college students diagnosed with ADHD with the choice to use convenience sampling. The instrumentation of Qualtrics, Grit Scale, and the 5-Point Likert scale will be detailed further, as well as the procedure that implemented those instruments. The following reflective pieces will be discussed for the integrity of this research: ethical awareness, assumptions, limitations.

Significance of the Study

The significance of this study will impact future research in Educational Psychology and Research, Grit, Health Sciences, ADHD, and education. School counselors and the public-school systems will benefit from the findings of this intervention. If parts of this intervention prove successful in improving students diagnosed with ADHD behaviors, then programs can be implemented into the daily schedules of students that mirror the successful portions of this intervention. It is plausible that public schools may begin implementing physical exercise programs in the beginning of the school day for 15- 30 minutes. This intervention may also lead to disability offices providing college students with morning exercise programs based on grit as an aiding resource to reach their full potential within their degree program.

There is minimum research on grit and current studies do not provide clear ways to develop Grit, only common factors that correlate to those who have high Grit rates. If students

grit rates increase from this intervention, that will provide a direct focus area for more research to be done on structured morning exercise to attempt to find a process to build grit in human participants. Since the current Theory of Grit tests humans based on current levels of grit measured by the Short Grit Scale (Duckworth & Quinn, 2009), there will possibly be a more efficient way to test the development of grit in different environments with different internal and external factors. Genetics and environment always coexist in creation to everything, but current grit research cannot define if grit is more susceptible to humans with certain genetic factors or is the development of grit is based solely on environmental factors. The results of this intervention will provide more insight that will help open new paths of research on this topic.

This study will be of importance for educators, special educator teachers, counselors, mental health professionals, and athletic coaches because it will provide positive tools that students with ADHD can utilize to become successful. Any teacher, coach, school administrator, or mental health professional can incorporate an interactive environment for their students to maintain their engagement and build the grit needed to manage their own behaviors. It is often said that it takes a village to raise a child and the same is true for helping a student graduate and transition into life successfully. When a child suffers from a mental health issue, it is not only the teacher's job, but the school counselor, coach, special educator, and parents work together to help the student become successful. Each of these fields can grow stronger by reviewing the results but implementing the intervention with their children, students, or clients that are diagnosed with ADHD. There will be more linear steps to follow to help preteens diagnosed with ADHD develop the intrapersonal skills needed to be successful in any environment.

Summary

With the increase in ADHD diagnosis of Americans within the previous decades starting at 6.1% in 1997 and rising to 10.2% in 2016 (Abdelnour et al., 2016), there is a need to find more productive lifestyles that support persons diagnosed with ADHD to encourage success of their roles in society. Studies have shown exercise to parallel with improvement in management of ADHD symptoms, but the research is still limited and new to the field. The purpose of the study is to implement The Grit Theory through structured exercise intervention and controlled external variables, to build grit within the students diagnosed with ADHD in hopes to increase the amount of productive classroom behaviors and classroom success. Three research questions, that address students diagnosed with ADHD, classroom behaviors, exercise effects, and The Grit Theory are proposed to begin this intervention with a focused purpose. This study will hold significance to many fields of research and education facilities including the Educational Psychology and Research field.

Chapter 2: Literature Review

One of the biggest modern daily struggles for preteens in the classroom is students who have been diagnosed with ADHD, especially in the 8-to-13-year age brackets. Students with ADHD often have one of two extremes of attention spans; either they struggle with being able to focus or there are spurts of hyper focus. These behaviors can lead to distractions in the classroom, disruptive behaviors for teachers and their peers, an inability to adequately absorb knowledge taught in the classroom, and inappropriate reactions that may lead to punishment. There are many students diagnosed with ADHD who take prescription medications, that often come with side effects which vary from student to student. Pharmacological medication treatments have been shown to improve quality of life, social functioning, and motor skills, but lacks in consistency to influence physical functioning (MeBler et al., 2018). Exercise can be seen as a replacement for pharmacological prescriptions because it improves social behaviors, motor skills, neuropsychological parameters, without the negative effects.

The goal for the reviewed study was to delve further into the benefits that different exercise trainings have for male students with ADHD for there are proven benefits of exercising; as well as the restrictions and length of the benefits have not been labeled (MeBler et al., 2018). Researchers wanted to explore how high-intensity interval training (HIIT) with male students who are diagnosed with ADHD influences their academic performance, social behaviors, motor skills and the neuropsychological parameters through the standard multimodal therapy (MeBler et al., 2018). The variables were assessed using surveys. This standard multimodal therapy used beginner to moderate level exercises for participants. This study was a randomized controlled trial, in which 28 boys of approximately 11 years of age, all diagnosed with ADHD and normal intelligence levels, were randomly assigned to be a participant in either the HIIT or traditional

fitness therapy groups. The study took place in the country of a high school, located in Oklahoma. Nine total participants were taking prescribed medications alongside the therapy measures. The participant requirements were to be between the age of 8-13, have an ADHD diagnosis, recommended by the student's physician/psychologist, and in good physical health. There was an assessment of oxygen intake, and heart rate for each student, taken before and after the intervention took place. Motor skills were included in these assessments using the Movement Assessment Battery for Children II (MeBler et al., 2018) to check for any impairments. The key findings suggested that exercise led to improvement of academics for athletes with ADHD.

There has been a rise in the amount of medication prescribed to students at Israeli schools. There is a pattern of teachers, counselors, and adults that show positive support for the use of medication among their students. There is a need to assess how the employees of the education system influence the medication intake of their students through different persuasion methods. The central purpose of this study was to "Characterize how parents, report the discourse between them and the teachers and counselors about referral of their children to diagnosis and medication; and what messages teachers and counselors use to recommend medication to children diagnosed with ADHD with stimulants" (Gesser-Edelsburg et al., 2019).

This study used the qualitative constructivist research method and was a case study (Gesser-Edelsburg et al., 2019). The setting of this study was phone interviews. These students were pulled from the Jewish and Arab populations in the school system. There were semi-structured interviews conducted with a total of 36 teachers or counselors and 11 parents of students between the age group of 9 to 14. This study took place between February 2017 to February 2018. Parents were chosen based on a heterogenic sampling to include participants of diverse ethnicity, ages, and socio-economic status.

Results showed that the parents were generally resistant to placing their child on medication because they would prefer a non-medical approach to helping their child in school. Results further indicated that parents were making decisions to place their children on psychiatric medications to treat ADHD based on recommendations from the education system employees. The teachers and counselors used persuasion strategies to get the parents of the children that consistently interrupted their class, to place their child psychiatric medication with the goal that the student will be calmer and more behaved during class. One strategy was referred to as "foot in the door" where teachers or counselors persuade the parent to first get a diagnosis, which is often met with less resistance and can be a gateway leading to prescribed medications. Normalization was another strategy used to get parents comfortable with giving their child medication because it is commonly happening across the United States. The key findings showed that professional and ethical boundaries were being crossed by the education system employees (Gesser-Edelsburg et al., 2019). There were two main findings, one is encouraging diagnosis, and the other is encouraging medication.

Theoretical Framework

Theory of Grit

The theory being used is the Theory of Grit as a predictor of success in life. This theory was developed by Angela Duckworth and Lauren Eskreis-Winkler (2015) to predict the success of an individual in life. This theory has been used to study how individuals are able to overcome hardships for long periods of time and reach their full potential. Grit has been used to measure college students' graduation rates, and adolescents' ability to stay in school as well as to overcome temporary depression and other mental diagnoses. This theory indicates that grit is not a fixed trait but can grow in individuals over time. As applied to my study, this theory holds that

I would expect exercise to influence good grades and classroom behavior in preteens with ADHD in public schools.

The theory of grit is best suited for my topic because exercise builds the same characteristic traits that are indicators of grit. People who consistently exercise and have high grit share the following traits: self-control, dedication, attention span, resiliency (Duckworth & Quinn, 2009). Based on previous research of grit, student success has been correlated to higher levels of grit. Grit can be built simultaneously with the exercise benefits, therefore leading to students becoming more successful in school.

Chapter 3: Methodology

The methodology of this intervention is based on an experimental design and has been created with a unique structure of steps. This intervention combines the use of The Grit Theory, exercise, and ADHD diagnosis in an educational environment. Although each individual topic has years of research, the combination of all four of these topics is new territory in the Psychology field. The following will more clearly explain the unique positionality of the intervention lead, the intervention's methodology, design, population, sample, instrumentation, and procedures.

Positionality

The researcher of this intervention has a unique positionality towards this intervention because of her mental health diagnosis of Bipolar I. The researcher can relate to the participants and does not take medication to assist with her mental health. The researcher has been utilizing exercise, nutrition, and structured schedules to maintain the best mental and physical health. The researcher is also a certified personal trainer through International Sports Science Association (ISSA) and is an advocate for mental health in the fitness industry. The researcher supports natural remedies for mental health and has a strong belief in the power of fitness and its positive effects on mental health for success in school or the workplace. The researcher will be the personal trainer leading the exercise program portion of the intervention, designed by her fitness brand's program.

The researcher is a current graduate student at The University of Memphis and has recruited peers of mutual school organizations from The University of Memphis and other universities across the United States. There is a chance that some of the participants will have personal relationships established with the researcher before the intervention is started. These

previous relationships may alter the comfortability level the participants have when choosing to fully engage or behave more reserved during the intervention.

Methodology

The researcher will seek participants across United States college campuses diagnosed with ADHD. Each potential participant will read and sign the Participant Consent Form (see Appendix A) before proceeding with the study. Students will be assessed for study eligibility based on the initial Pre-Intervention Interest Survey (see Appendix B). The pre-intervention study will take place between the first week to sixth week of the fall semester. This survey is open to any college student attending any accredited USA college and seeking any level of degree.

Participants will be chosen for this study if they meet the following requirements: Diagnosed with ADHD, enrolled in an accredited college during the fall 2021 semester as a full-time student, completed the Spring 2021 semester enrolled Full-time, physically able to participate in physical activities such as exercise, willingness to participate in daily intervention for four weeks. The eligible participants will be notified via email. Next, times for the intervention zoom calls will be established via email communication and a calendar invite will be shared for all dates. Each participant will have a unique intervention plan. It is expected that each participant participates in 30 minutes of cardio activity before the participants attend their classes for the day. The cardio intervention may take place any time that day that falls before their first-class time. The intervention session may happen at any time that is before their first class for that same day. Each student will exercise each day that they have a class, within Monday through Friday. Weekend classes will not be included in this study.

The daily cardio interventions may include more than one participant. All participants will sign a confidentiality and non-disclosure agreement (see Appendix B). Participants are allowed to modify exercises in the intervention with the major focus being consistent movement for 25 minutes. 5 minutes of stretching, 5 minutes of a warm-up and a 5-minute water break will be included in the daily interventions (daily intervention references the specific days each participant will participate in the intervention depending on their class schedule). Participants must complete a minimum of 80% of their intervention plan for their data to contribute to the results of the study. Since each student has a different amount of intervention sessions they are required to attend per week, the number of sessions that must be attended will also differ. If a participant's classes are all canceled for the day, then an intervention session is no longer required for that day. The participant must report canceled classes in their daily intervention survey and submit proof. Each day the participants have an intervention session, the participants are required to complete a Daily Intervention Survey (see Appendix D) after all classes have been attended for the day. If a participant skips a class without an excused reason from their professor(s), then that will count as a missed intervention session. If a student misses more than one week of interventions, then their data will not be included in the results. If a student gets tested and has COVID-19 and has in person classes they cannot attend remotely, then the participant may be excused for 14 days, given proof of positive COVID test is shown. If more than 14 days are missed, then the participants' data will not be included in the findings.

At the end of the semester and completion of the intervention, a post-intervention survey will be emailed to all participants (see Appendix E). To gather quantitative data, a Likert scale will be used to measure the short grit scale questions, as was used in the Daily Intervention Survey. All data will be quantitively measured and compared using numerical symbolism. The

intervention will be complete after a total of four weeks have passed. The independent variables of this study are the participant's amount of exercise. The dependent variables are the participant's grades and behavior in the classroom. The researchers will secure students grades through the Post-Intervention Survey and elf reported behavior through the Daily Intervention Surveys. Participant's attendance and participation in all criteria of the intervention will be noted.

Design

An experimental design (Creswell & Creswell, 2018) will be used to implement the four-week exercise intervention and to obtain data required for this study. The design is appropriate for the chosen study with the goal of implementing a four-week exercise intervention program for students with ADHD in college that will test the effect consistent exercise has on students with ADHD. It will allow data to show the amount of grit built from consistent exercise and if more grit correlates to better grades in college.

This study will produce quantitative data because there is a need to measure for certainty. There will be Qualitative questions that will become quantified through the instruments used as answer choices, such as the 5-point Likert Scale.

Population

The ADHD community is diverse, and can be found in young children, adults, women, men, or any type of person (O'Neal, 2016). ADHD does not discriminate based on race, gender, ability, religion, nor anything else. Growing up in low social economic status or with minority status may contribute to the development of ADHD, but ADHD also can be passed along genetically (O'Neal, 2016). Students with ADHD often receive more punishment and less

patience or understanding, especially in the classroom. This societal bias contributes to the obstacles that students with ADHD face, making academic success more difficult to achieve.

This study focuses on college students that attend American universities that have been diagnosed with ADHD. All the participants are involved in extracurricular activities or organizations for their universities. The only age requirement is that the student is the legal age of 18 years by the start of the intervention, but the study is open to all genders, race, and nationalities.

Sample

Convenience Sampling

Convenience sampling will be used to select 10 students from accredited college campuses who have ADHD to participate in the proposed intervention and study. Since this intervention will take place remotely, participants do not need to travel to participate in this study. The target participant will be enrolled in college, both female and males of any race, religion, age, or ethnicity. This sampling method is appropriate for the proposed study because this intervention requires a specific type of participant—namely, college students with ADHD who may have negative behaviors and poor academic achievement.

Recruitment

Participants were recruited for a one-month time frame during September 2021 via social networking groups attached to universities across the United States. The intervention lead is a member of Lambda Theta Alpha Latin Sorority, Inc. and sent the digital link of the Pre-Intervention Survey (see Appendix C) to other members currently enrolled in college courses across the United States that are members of this sorority, or the fraternity connected to it. The intervention lead also asked members of other local University of Memphis Registered Student

Organizations (RSO) to take the Pre-Intervention Survey (see Appendix C) for qualification purposes. Out of 27 completed surveys, 15 students were eligible to participate in the intervention. Only 13 students were receptive to communication and agreed to participate in this intervention. Out of the 13 students that started the intervention, only 10 students met the requirements of attendance to successfully complete the intervention.

Instrumentation

This intervention measured the participants using self-reporting surveys. All surveys were registered using the Qualtrics platform and private links were sent to participants using email. There was a total of three surveys: Pre-Intervention Survey (see Appendix C), Daily Survey (see Appendix D), Post-Intervention Survey (see Appendix E). The Pre-Intervention survey was used as a qualifier to find participants that met the requirements of the study. This survey included several sections used to gain basic information about the participants along with measurements of GPA levels, classroom behaviors, and grit levels before the interventions. This survey included the following sections: personal information, mental health diagnosis, college information, Spring 2021 semester details, exercise experience, and the Short Grit Scale (see Appendix F). Please see Figure 1 for an example of the Pre-Intervention Survey. This survey was a mix of multiple choice and short answer questions, with two 5-point Likert Scales (one measuring the qualities of grit, the other measuring the amount of grit).

The Daily Intervention Survey was required to be completed every day the participant had class Monday through Friday. The participant was required to attend the exercise intervention at some point before the start of their class(s), attend class, then complete the survey to detail their thoughts, behaviors, focus, and external factors that occurred to affect them during class. This survey included the following sections: class attendance, sleep, nutrition, external

factors, and a 5-point Likert scale measuring different behavior levels. See Figure 2 for an example question from the Daily Intervention Survey. The survey answer choices were majority made of multiple choice and short answer questions and included the one 5-Point Likert scale.

The Post-Intervention Survey was meant to mirror parts of the Pre-Intervention survey, with the purpose to measure growth in grit, classroom behaviors and classroom success. This survey included sections of intervention completion, class grades, measurement of grit characteristics, the Short Grit Scale (see Appendix F), and initiative of exercise behaviors. This survey consisted of multiple choice, short answers, long answer and two 5-point Likert Scales.

Qualtrics

The three surveys were created using the Qualtrics software at this site: https://memphis.co1.qualtrics.com/homepage/ui. All surveys were sent with an anonymous link to the Qualtrics site. The only identifying information provided is the participants email on the Pre-Intervention Survey (see Appendix C) and the name option (see Appendix C-E) that did not require participants government name but allowed participants the choice to use a nickname.

Short Grit Scale (Grit-S)

The Short Grit Scale was developed in 2009 by Angela Lee Duckworth and Patrick D. Quinn as a self-report measurement to define the amount of trait level of perseverance and passion for long term goals. The short scale uses 8 questions measured using a 5-Point Likert Scale (see Appendix F) and an example in Figure 3. According to the research conducted by Nimisha Beri, Amita Sharma, the “grit scale possess a good reliability as the calculated value of Cronbach's alpha is 0.724” (Beri & Sharma, 2019). The grit scale measures the level of characteristic traits (energy, focus, motivation, self-control, and resilience) a person possesses that define their level of potential grit.

5-Point Likert Scale

A 5-point Likert Scale contains 5 response options that consists of two extreme sides and a neutral option linked to the middle answer options. Examples of a 5-point rating scale for measuring satisfaction are: none, less, some, more, most. Researchers can use repetitive techniques by rewording previous questions to verify the validity of participants answers. See Figure 4 for an example of a 5-point Likert scale.

Study Procedure

1. Design Participant Information Sheet (see Appendix A), Consent Form (see Appendix B), Pre-Intervention Survey (see Appendix C), Daily Intervention Survey (see Appendix D), and Post Intervention Survey (see Appendix E) using Qualtrics software.
2. Prepare intervention invite email that includes an anonymous link to the Pre-Intervention Survey.
3. Recruit college students that have been diagnosed with ADHD, attended college the previous Spring 2021 semester, and are currently enrolled full-time in the Fall 2021 semester.
4. Send the intervention invite email to all students interested in participating that meet the requirements, before the September 12, 2021, deadline to complete the Pre-Intervention Survey.
5. Analyze the Pre-Intervention Survey results and make a contact list for each student that meets the requirements of the survey.
6. On September 15,2021 send individual emails to all eligible participants that explains their acceptance to this study, asks for their class schedule, proof of registration allowing for screenshots, class schedule, proof of Spring 2021 class enrollment, and the attached

Participation Information Sheet (see Appendix A) with the Waiver (see Appendix B) to sign.

7. Set deadline for Participation Information Sheet and Waiver for September and required proof for September 26, 2021.
8. After receiving proper documentation, send reoccurring Zoom meetings to each participant for the agreed intervention time before they begin class(es). These meetings will reoccur for four consecutive weeks and last for 30 minutes each session.
9. Begin the Intervention on October 4, 2021.
10. During the intervention session, there will be 10 minutes of stretching/warm-ups, 15 minutes of physical activity with a five-minute water break, totaling to 30 minutes. The webcams should be able to see the entire body of the researcher and participant and make sure there is good lighting.
11. Each student should attend 80% of their required intervention sessions. As soon as a participant misses one session past 80% of their allotted amount, they will be terminated from the intervention and data will not be included in the results.
12. The participants should attend all classes.
13. After participants finish all classes for the day, they are required to complete the Daily Intervention Survey (see Appendix D). If a class was canceled, the participant should attach proof of cancelled class(es). If they miss a class, they must submit the survey saying they did not attend their class(es).
14. The intervention ends on October 29, 2021.

15. The participants are required to take the Post-Intervention Survey (see Appendix E) after the completion of their intervention program. The Post-Intervention Survey is due by November 5, 2021.
16. On November 6, 2021, an end of intervention email will be sent to all participants thanking them for their participation in the intervention and allowing for any questions on closure to be asked.
17. All data will be downloaded from Qualtrics for all three surveys. The data will be in one excel form with three separate tabs for the total results separated by survey, then tabs separating participants individual's data.
18. The results will be calculated through use of the data in a frequency table, demographics table, paired samples t-test, and a chi squared test.

Proposed Data Analysis

All surveys will be completed online using Qualtrics, the umSurvey software that the University of Memphis uses, and data will be entered into a table using excel. There will be a separate tab and table for each participant. Pre-Intervention and Post-Intervention survey data for participants will also be analyzed using Qualtrics. The data may become skewed if any of the participants miss a class or is not present for the exercise portion for the intervention. The expected response rate for the surveys is 100% because they may be completed online during their own time. The expected rate for the intervention data is 80% accounting for missed class, illness, and emergency situations. Students may decide to drop out of the intervention for various reasons, and athlete participants may have low results because they have a structured fitness plan established before the intervention. Validity is ensured by collecting multiple forms of the same data, and having an outside auditor review the study once it is completed to provide an objective

assessment of the study. The results will be analyzed using the following three analyzations: demographic table, paired sampled t-test, and chi squared.

Ethical Awareness

Our society is still in a pandemic, so there are health risks of any person-to-person interactions. The entire study will be solely remote. The Pre-Intervention, Daily Intervention, and Post Intervention Surveys will be completed using Qualtrics by emailing a survey link to each participant. The intervention will take place during a zoom call. Requirements for eligibility for this study is open to both remote and in person classes, so participants have a choice whether they want to take in person classes but are not required to for this intervention.

With there being limited time, one intervention guide, and differing schedules each day, participants may share the same intervention session. Participants might be worried that their confidentiality in the study may be jeopardized by other participants knowing they are diagnosed with ADHD. Participants who aren't familiar with working out may also have insecurities and become shy, nervous, or turn away from exercise in front of other participants. To combat confidentiality, each participant must sign a consent form that discusses and set boundaries on what confidentiality is. Participants will also be verbally told that all identities must remain confidential. It is also likely that participants with the shared identity of ADHD diagnosis will be able to relate to each other's experiences and struggles. Thus, being involved in a community specifically for those diagnosed with ADHD can become motivating and supportive. It is often motivating to have workout partners, which might help to push the participants who have less exercise experience.

Participants may also be weary of providing the details of their personal feelings, and classroom behaviors for fear of punishment or leaked information. Every measure will be taken

to maintain confidentiality during the entirety of the study. Participants have the option of using an alias with this study and are informed of this option before beginning. Participants do have to keep the same "identifying name" throughout the entire study. There will be no way to tie the data to the real identity of the participant once the survey is completed and the data is taken.

Assumptions

The Grit Theory is integral to the development of academic success for adolescents with ADHD. Therefore, I expect the data to show that exercise is an effective intervention measure that positively affects classroom behavior and academic success (Marquis et al., 2015). I expect the data will also show that the students have gained grit through learning self-discipline, resiliency, and dedication from the intervention (Sriram et al., 2018). This expectation supports the prediction that grit can be learned through structured and supportive environments, despite the amount of predisposed genetic acceptability to grit there is for a person.

Limitations

Potential bias could be found with the researcher of this intervention. The researcher filled multiple roles of this intervention including recruiter. All participants were connections from the researcher's academic organizations or friend groups. The researcher's more intimate relationship and understanding of specific participants may lead to the participants' participation being biased during the intervention exercise sessions and mindfully altering their answers to the self-reporting daily surveys due to their comfortability of their personal relationship. It is also possible that this bias is mirrored through the researcher's behavior, because of the personal understanding of specific participants, the researcher could have unmindfully altered the approach during the intervention exercise sessions, as well as added assumptions to the analysis

of the participants self-reporting surveys because of the personal knowledge and experience the researcher has with thus participants.

There are possibilities of imprecision of measures due to all measures being based on self-reporting surveys. Each participant comes from different life experiences, as well as different geological locations, that may alter the way each participant interprets a question, statement, or definition. Many participants do not have a psychological background, and this may be the first time they have been asked questions using the terminology within the required self-reporting surveys. Even when definitions and instructions are applied, it is possible for new information to be misunderstood from seeing it used in only one context.

There are a few limitations to this study. One weakness is this study took place in October 2021, during the beginning of post-covid living in America. This time was when work and school began to transition to hybrid roles while working towards safely bringing back full-time in person roles. Every university had its own unique process to adapt to this adversity. Our participants had a variety of online, hybrid, and in person classes. This circumstance added an extra layer of external factors that could have potentially affected this intervention's results without a clear way to account for its affects. The post-Covid19 period had many life-altering obstacles for most Americans and holds a strong possibility to add trauma to any of our participants. We also chose to have online exercise intervention sessions, which can possibly affect the motivation levels of each participant to fully engage in the sessions without the accountability of being directly in the presence of the intervention coach.

Summary

This intervention based on 30-minute exercise sessions to build grit in college students diagnosed with ADHD is a quantitative experimental design that targets adults enrolled in

American universities, using a convenience sampling method of 10 qualifying participants. The researcher has some positionality biases, such as the overlapping roles of intervention coach, researcher, and participants' peer that may affect participants behaviors. The researcher relates to the participants through her own mental health diagnosis, with strong practices of healthy behavior and structure to prevail the negative symptoms of her mental health without the use of psychiatric medications. Participants will self-report through surveys created through Qualtrics for the Pre-Intervention, Daily Interventions, and Post-Intervention surveys and be analyzed through a paired sampled t-test, demographic table and a chi squared tests.

There are three possible issues of ethics with this intervention taking place during the pandemic, participants sharing vulnerable information, and participants sharing exercise sessions. All ethical issues are addressed with a productive plan in place. This study takes the assumption that exercise will positively show correlation with the increase in grit for students diagnosed with ADHD. The limitation of this study includes bias from the researcher who fulfills multiple roles in this study, inaccuracies with participants self-reporting measurements, and weaknesses in the intervention for being remote with less systematic similarities in type of classes for participants.

Chapter 4: Findings

This intervention will share the frequency and variation of scores on classroom behaviors for the students with ADHD through a frequency table. The Grit Theory will explain the relationship between exercise and class behavior through a paired-sample t-test. A chi-squared test will show how exercise has proven to show improvement in classroom behaviors of students with ADHD.

At the end of the intervention, 10 participants remained with a minimum of 80% or more completion of the program. Of the 10 participants, 8 (80%) were seeking a bachelor's degree, while 2 (20%) were seeking a master's degree. Although, 7 (70%) participants were classified as female and 3 (30%) as male, some participants identified their gender differently than their sex: 6 (60%) woman, 2 (20%) man, 1 (10%) non-binary, 1 (10%) gender neutral. Only one participant was under the age of 21 but was still legally considered as an adult. When the participants self-identified ethnicity, Black, Caucasian, and Latinx each had 2 (20%) participants with 4 (40%) participants identifying as unique mixed races. For nationality, 7 (70%) are Americans, 2 (20%) are Dominican, and 1 (10%) is Mexican. See Table 1 to view the demographics of the participants.

Trustworthiness

This intervention can be deemed trustworthy because of its dependability, credibility, confirmability, and transferability. The data is not directly affected by bias and can be replicated. The data's results can be generalized to different age groups and different diagnosis. All proper protocol was followed, and the tests were run correctly through SPSS.

Dependability

The dependability of this intervention was conducted by use of specific recruitment screener parameters that allow representation from a broad range of demographics, universities, experience, geographic location and so on. This allows the insights to represent the target audience desired because this study doesn't represent a slanted viewpoint from one concentrated demographic. The parameters for recruitment had very few limiting factors and are as followed: of 18 years of age or older, registered at an accredited university in the United States for Fall 2021, completed the Spring 2021 semester at an accredited college, is diagnosed with ADHD. All methods used to design this intervention are precisely defined with examples of the surveys included in the appendices, making this intervention easy to replicate. The only changes to the results would come from external factors in the participants' lives that cannot be controlled for in the classroom nor intervention.

Credibility

The results discussed in this intervention show credibility because all data was interpreted based on the results of the tests that were run. The results were discussed among peers familiar with statistics to validate the researcher's interpretation of the results. This allowed the researcher to have more time observing the data and to be able to analyze the test results with a fresh mind to fully engage the amount of thought and accuracy used to determine the results. Each test that was ran on the data set, was ran based on strict rules set for each test in SPSS. Researcher bias should not affect the interpretation of results because no opinion was included in the results, only facts and data were explained.

Confirmability

All data from this intervention was collected through self-reporting measures directly through Qualtrics. The researcher had zero access to alter the data while it is in Qualtrics. The

researcher followed all appropriate steps when running a paired samples t-test, chi-squared test, demographic table, and frequency table. These tests could be rerun by another party with the same data set and show the same results found by the researcher of this intervention. This intervention is confirmable because it produced findings that objectively reflect information collected from participants.

Transferability

The results of this intervention are likely to be transferable to students of different learning levels such as primary and secondary school students. Children tend to have more energy, so implementing this intervention for morning exercise routines before classes begin can potentially add structure, focus, and a decrease in classroom behavioral problems. This intervention targeted adult students diagnosed with ADHD but is possible to have similar results with students that have other mental health diagnosis. This intervention can be generalized to students of all ages, as well as humans with or without different types of mental health diagnosis.

Findings

Paired Sample T-Test

The purpose of conducting a paired-samples t-test is to find if there is a difference within the participants of this intervention between the Pre-Intervention Survey and the Post-Intervention Survey, to determine whether this exercise intervention has effects on college students with ADHD. A one-tailed significance is used to determine whether this single population of college students with ADHD Post-Intervention Grit scores are greater than or less than the Pre-Intervention Grit scores. According to the results shared in Table 2, there was a significant difference in the scores for the Pre-Intervention Short Grit Scores ($M = 2.8$, $SD = .789$) and the Post-Intervention Short Grit Scores ($M = 3.7$, $SD = .675$) conditions; $t(9) = -2.862$,

p = .009. The null hypothesis was rejected, and the alternative hypothesis is assumed true. The Grit Theory does explain the relationship between exercise and class behavior, controlling for the effects that exercise has for students diagnosed with ADHD. Since assumptions are true, it can be 95% sure that the 95% confidence interval contains the true difference between means.

Chi-Squared Test

The classroom behavior measured four traits, energy, focus, motivation, self-control, and resilience on a 5-Point Likert scale with 1 being the least amount and 5 being the most amount. All five scores were totaled together to find the overall average score for classroom behavior for each participant. The total mean score is being measured in the chi-square test.

We had 10 valid cases and no missing cases. The observed count is the observed frequency in a particular cell of this crosstabs table. Table 3 shows the Pre-Intervention mean scores of the total of self-reported Pre-Intervention classroom behaviors ranging from 2-4, versus the Post-Intervention Survey classroom behaviors with the total mean scores ranging from 3-4. The range of the total average mean increased 1 point from the start of the Pre-Intervention Survey to the end of the Post-Intervention Survey. There were 8 scores that total mean increased in the Post-Intervention Survey versus when the original Pre-Intervention survey was taken. According to Table 4, the value of the chi square statistic is 1.875. The p-value (.759) is more than the designated alpha level .05; therefore, we will accept the null hypothesis that exercise does not significantly influence the classroom behaviors of a student that is diagnosed with ADHD.

Summary

The findings of this intervention show that grit increases with the increase of structured exercise when testing for classroom behavior scores. This relationship has proven to be

significant through a paired-sample t-test. Exercise does not have a significant relationship to classroom behavior because the chi square test proven the increase in test scores to be due to chance. There needs to be more evidence to test against to validate the accuracy of this result.

Chapter 5: Discussion

Exercise and ADHD has been examined together I previous studies, but there was a gap when it came to accounting for external factors that may alter results of their participants. This intervention accounts for all possible factors that could affect a participant's classroom behavior and intrinsic levels of thought. It also connects The Grit Theory to exercise and student success. The Grit Theory does not have much previous research that explains how it can but built because the research typically focuses on the level of grit one has at the present time. This intervention was able to show that grit can increase with either structure or exercise. It is not guaranteed that grit increases directly because of exercise or the structure of the intervention program, but it does show correlation between the two.

With this intervention, classroom behaviors increased at a steady amount. The participants did not have the highest possible scores, but all except for one participant improved their total score for their self-perceived classroom behavior. This shows that the characteristic traits that define grit are being built alongside the improvement of classroom behavior. A chi squared test was ran on self-reported classroom behaviors to compare the pre-intervention results to the pos-intervention results, to determine if the difference in data is due to chance or a relationship between the exercise and classroom behaviors. The results show that the increase in scores were likely due to chance. Although 8 of 10 participants' classroom behavior scores increased after the intervention, only one score remained the same and 1 score was below its original average score. This uncertainty of a relationship between exercise and classroom behavior may be due to a small sample group of only 10 participants or because the intervention only took place one month of the semester that was being researched. It is possible that extending the length of the intervention for the entire semester could provide more reliability, as

well as potentially improving the scores are a higher level. If there was an increase in sample size, the number of students that increase their classroom behavior scores are estimated to be a greater percentage than the few that did not. Adding more participants to the pool will likely increase the likelihood of a relationship between the variables because higher numbers will be more powerful against the outliers.

Implications

The findings of this intervention provide a means of support for students diagnosed with ADHD across the United States. Public, charter, and private primary and secondary schools can potentially implement a version of this intervention into their students' daily routines, leading to behavior improvement in the classroom, higher levels of focus, and more motivation for the tasks at school from children who previously had issue in the classroom or with their grades.

This study has opened a new area of research that combines 3 subjects that were previously looked at separately: exercise, grit, ADHD. This intervention used participants from a wide variety of parameters. There are many new directions that researchers can take to further explore how exercise builds grit to help students succeed. There should be an intervention with elementary, middle, and high school students, all from the same school district that compares the results between the different level of education groups. This intervention could also be done with students in the same course at college and comparing the student with mental health diagnosis to a controlled group of students who do not have a mental health diagnosis. The intervention might be more effective if it was lengthened to last the entire semester of the college courses and can give more accuracy to the effects on the participants' final grades from their courses. This is the first intervention of its kind, and there is plenty of growth and experimentation that can be done by Educational Psychology and Researchers.

Recommendations for Future Research

Future researchers should increase the requirements for participants to be accepted into the intervention. Participants should also be recruited by an individual that will not be a face during the intervention or research process. The personal trainer for the intervention should be separate from the researcher to eliminate observation bias. The intervention sessions should be in-person. There should be separate study groups for participants taking in person classes, versus students taking online courses, to accurately reflect the differences in the learning environments and the effects they have on the participants. There should be more groupings based on age, to determine if age affects the results of the intervention, and ability to build grit.

Recommendations for Future Practice

The results from this study can be implemented into public or private primary schools by adding a 30-minute period of physical exercise in the morning before classes begin. Student's grit levels can be assessed by using the Grit-S (see Appendix F) day 1 of the semester and again at the end of the semester. Students with IEP's behavior can be tracked for each classroom and their improvement can be documented.

College wellness offices can implement the key ideas from this intervention. The disability offices and mental health resources can have options for students to partake in early morning physical activities and include options for the Grit-S pre-test and post-tests.

Conclusion

Starting your morning off with exercise can be a beneficial component if you are diagnosed with ADHD. The structure of consistent exercise can help to develop energy, focus, motivation, self-control, and resilience which are all characteristics of a person with a high level of grit. The results of this intervention cannot directly show that exercise builds grit, but

increased levels of grit correlate with consistent exercise of students diagnosed with ADHD. This intervention deserves to be investigated further to fully understand the capabilities when combining exercise and grit. All except 2 scores of classroom behavior did improve. Exercise did not show to have a relationship that isn't due to chance with improved classroom behavior, but there are suggested improvements to this intervention that may conclude different results.

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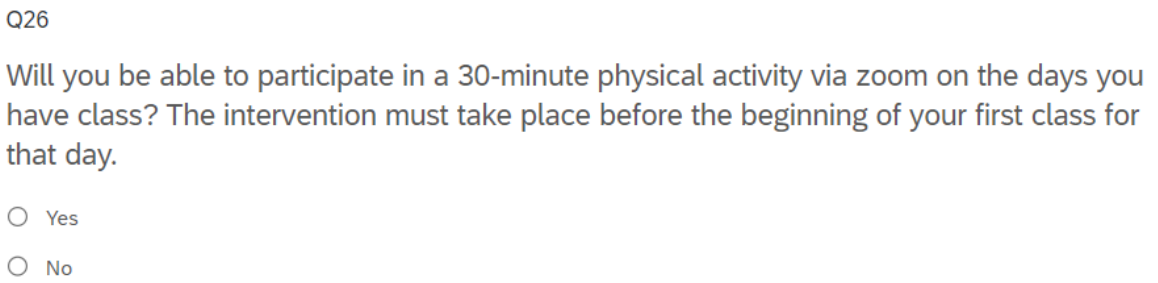
List of Figures

Figure 1.

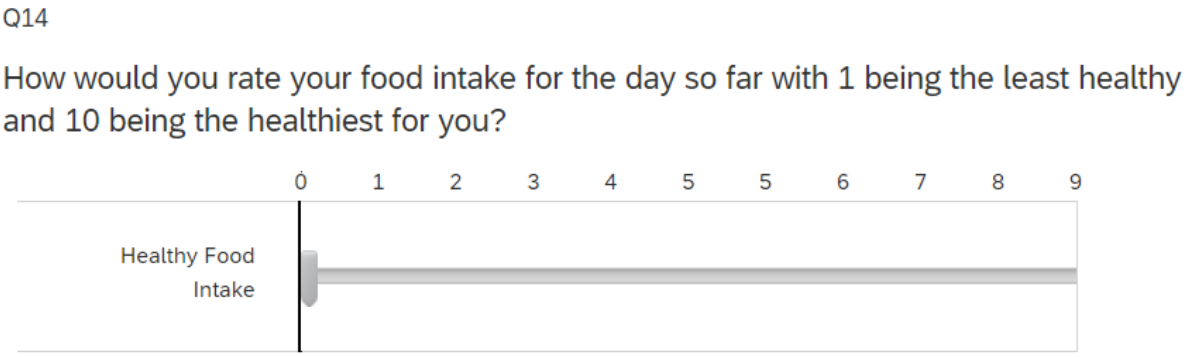
Pre-Intervention Survey



Note. An example of a question found in the Pre-Intervention Survey

Figure 2.

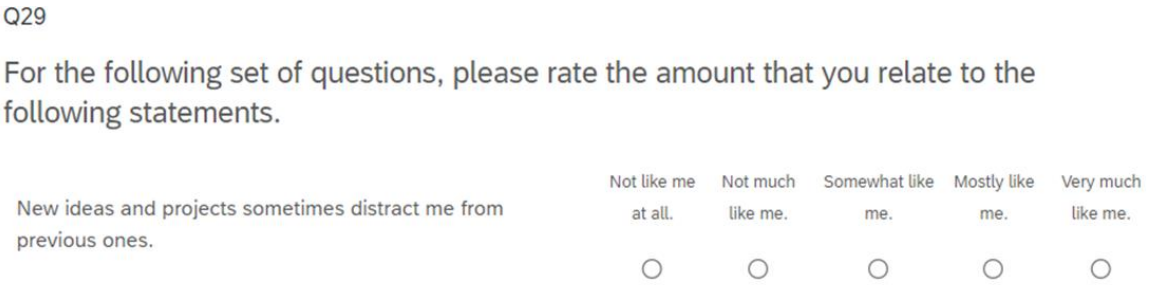
Daily Intervention Survey



Note. This figure is an example of a question on the Daily Intervention Survey.

Figure 3

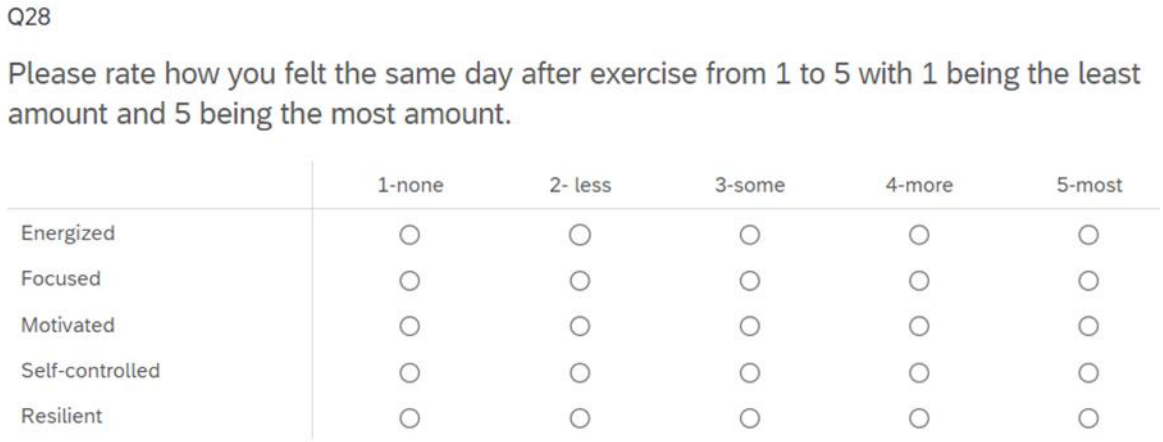
Short Grit Scale



Note. This example is a question from the Short Grit Scale.

Figure 4

5-Point Likert Scale



Note. This example is an example of a 5-Point Likert scale question located in this intervention's surveys.

List of Tables

Table 1

Demographics

Baseline Characteristic	N	%
Sex		
Female	7	70
Male	3	30
Gender		
Gender neutral	1	10
Man	2	20
Non-binary	1	10
Woman	6	60
Age		
> 21	1	10
21-24	6	60
25 +	3	30
Ethnicity		
Black	2	20
Caucasian	2	20
Latinx	2	20
Mixed Race	4	40
Nationality		
American	7	70
Dominican	2	20
Mexican	1	10
Degree Seeking		
Bachelors	8	80
Masters	2	20

Note. N = 10, for total number of participants.

Table 2

Grit Theory Exercise Classroom Behavior

Grit	N	M	SD	t-value	df	p	decision
Pre-Intervention	10	2.8	.789	-2.862	9	.009	Significant
Post Intervention	10	3.7	.675				

Note. N= number of participants, Mean is the average grit score of total participants of each survey. SD= standard deviation. T-value is a ratio of the difference between the mean of the two sample sets and the variation that exists within the sample sets. DF = degrees of freedom. P communicates if difference is statistically significant.

Table 3

*Pre-Intervention * Post Intervention Crosstabulation*

Count

		Post Intervention			
		3	*4*	*5*	*Total*
Pre-	*2*	*2*	*2*	*0*	*4*
Interve	*3*	*1*	*2*	*1*	*4*
ntion	*4*	*1*	*1*	*0*	*2*
Total		*4*	*5*	*1*	*10*

Note. This crosstabs table includes information about the self-reported classroom behavior scores on energy levels, focus, motivation, self-control, and resiliency. Each trait was measured using a 5-point Likert scale and then the scores were totaled together to find the mean. The means from the Pre-Intervention Survey ranged from the 2-4 scores and increased by 1 point, 3-5 range of means from the Post-Intervention Survey. This table shows how many participants' scores changed versus remained the same.

Table 4

Chi-Square: Classroom Behavior

	Value	df	Asymptotic Significance (2sided)
Pearson Chi-Square	1.875	4	.759
Likelihood Ration	2.231	4	.693
Linear-by-Linear Association	.063	1	.802
N of Valid Cases	10		

Appendix A

Participant Information Sheet

How Exercise Builds Grit to Help ADHD College Students Succeed in School

You are being invited to take part in a research intervention. An intervention is a program designed to interactively assist a person with the issue it is meant to assist with. This research will test how daily exercise effects the success of college students with ADHD in class. In this intervention, students will participate in 30 minutes of cardio, including stretching and warm-ups, daily before the start of their classes. The cardio is only mandatory on days you take your classes and must happen before the start of your first class. This intervention will take place for four consecutive weeks and the number of days assigned for cardio will differ for each participant depending on the number of days they have class. The cardio sessions will be via zoom and led by a certified persona trainer. The participants will not be required to do any extreme movements and may modify any recommended exercise to their fitting. Proper stretching and warm-ups are included in the 30-minute intervention for safety. Each participant will be taught new movements and workouts that they can implement in their own exercise after the intervention is complete. Participants are expected to complete a quick 5-minute survey after their classes, each day they are scheduled for a cardio session. Participants are asked to complete the Daily Intervention Survey when they miss class or miss the intervention session. After the 4-week intervention is complete, and each student receives their grades for the semester, a post-intervention survey will be sent for completion.

Who Can Participate?

You may choose to participate in this study if you are eligible based on the pre-intervention survey. Participants will be chosen for this study if they meet the following requirements: Diagnosed with ADHD, enrolled in an accredited USA college during the fall 2021 semester as a full-time student, physically able to participate in physical activities such as exercise, willingness to participate in daily intervention for four weeks. This intervention will be completely remote, so participants from any college in the USA may be included.

You cannot participate in this study if:

- You are a part time student.
- You are not a US citizen.
- You were not enrolled and completed your Spring 2021 semester.
- You have physical health illnesses, current injuries, or anything preventing you from being able to exercise without causing harm to your body.
- You have another mental health diagnosis that may conflict or be more dominant than your ADHD diagnosis.
- You cannot access zoom meetings via internet.

Risks of Study.

A participant may choose to end their participation in this intervention at any time. They are allowed to miss up to 20% of their sessions before being removed from this intervention. All information in this study will remain confidential and only be seen by the researcher. Participants may use an alias name during the intervention and will be assigned a number for identification

purposes. All data received during the study will be saved under the identifying number. This study contains minimum to no risks. Risks may include other participants being aware of your identity if they may know you from outside of the study. There may be basic physical injury if an exercise is performed incorrectly, a participant does not stretch well during the stretch time, or the participant has previous injuries that have not fully healed. Risk of injury will be minimized if the participant follows the guidelines given by the intervention instructor. Injury may also occur if the participant is not wearing the proper footwear or does not have an organized area to use during the workout. This risk of injury may be minimized by the participant wearing the proper foot attire and cleaning an organized space for their workout. Participants may be at risk of passing out, having a headache, or throwing up depending on the amount of sleep, amount of water intake, and amount of food intake the participant has had. Participants may reduce this risk by getting 6-9 hours of sleep daily, drinking enough water throughout the day, drinking a glass of water before the intervention session, eating healthy portions of food that will fuel their body at least thirty minutes before the intervention session, and taking necessary breaks during the intervention session if a participant starts feeling ill.

Appendix B

Consent Form

How Exercise Builds Grit to Help ADHD College Students Succeed in School

By signing this consent form, I am confirming that I have read and understood the information about the Participant Information Sheet. I confirm that I have had the opportunity to ask questions and the researcher has answered my questions to my satisfaction. I understand that my participation is voluntary and that I am free to withdraw from the intervention at any time, without having to give a reason and without any consequences. I understand that I can withdraw my data from the study at any time. I consent that any information recorded in the investigation will remain confidential and no information that identifies me will be made publicly available. I consent to use of the data in research, publications, sharing and archiving.

Please sign and date below:

_____	_____	_____
Print Name	Sign Name	Date

Appendix C

Pre-Intervention Survey

Start of Block: Personal & Demographics

Q2 Please provide your email.

_____

_____

_____

_____

_____

Please provide a first and last name. (It can be a nick name or alternate name).

_____

Q31 What is your sex?

_____

Q30 What is your gender?

_____

Q4 What is your age?

_____

Q5 What is your ethnicity?

_____

Q6 What is your nationality?

_____

Q7 What is your current GPA for the current degree you are pursuing?

_____

Q3 Have you been professionally diagnosed with ADD or ADHD?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Have you been professionally diagnosed with ADD or ADHD? = No

Q8 Are you diagnosed with a mental health condition other than ADD or ADHD?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you diagnosed with a mental health condition other than ADD or ADHD? = Yes

Q9 Please list your diagnosis.

_____

End of Block: Personal & Demographics

Start of Block: College

Q11 Are you currently enrolled in an accredited college?

- ○ Yes (1)
- ○ No (2)

Skip To: End of Survey If Are you currently enrolled in an accredited college? = No

Q12 What is the name of the college you are currently enrolled in?

_____

Q13 How many credit hours are you taking Fall 2021? (1-21)

_____

Q14 Which degree are you seeking as of Fall 2021?

▼ Certificate (6) ... Law (5)

Q15 Are you registered for full time or part time in Fall 2021?

▼ Full Time (1) ... Part Time (2)

Q16 What type of classes are you registered for? (If you have some remote class(es) while the rest are in person, you may choose hybrid.)

▼ in person classes (1) ... remote (3)

Q17 What days of the week are you registered for classes? Check all that apply. (Weekend classes are not included in this study.)

- ☐ Monday (1)
- ☐ Tuesday (2)
- ☐ Wednesday (3)
- ☐ Thursday (4)
- ☐ Friday (5)

Q18 What was your previous semester [Spring 2021] GPA? Not your culminative GPA.

_____

End of Block: College

Start of Block: The following questions will pertain to your Spring 2021 semester only. Please

Q20 The following questions will pertain to your Spring 2021 semester only. Please answer according to your Spring 2021 experience.

Q21 Did you ever exercise?

▼ Yes (1) ... No (2)

Display This Question:

If did you ever exercise? = Yes

Q22 What type of exercise did you do? Check all that applies.

- ☐ Yoga (1)
- ☐ Cardio (2)
- ☐ Weight Training (3)
- ☐ Sports (39)
- ☐ Running (40)
- ☐ HIIT (41)
- ☐ Walking (42)
- ☐ Other (43)

Q23 On average, how many times a week do you exercise?

▼ none (1) ... 16+ times (5)

End of Block: The following questions will pertain to your Spring 2021 semester only. Please

Start of Block: Block 3

Q24 Do you have any medical conditions that might prevent you from exercising or physically restrict your body?

▼ Yes (1) ... No (2)

Q25 If willing, can you elaborate so that the study can be modified to fit your needs. All parts of this study will remain confidential.

_____

_____

_____

_____

_____

Q26 Will you be able to participate in a 30-minute physical activity via zoom on the days you have class? The intervention must take place before the beginning of your first class for that day.

- ○ Yes (1)
- ○ No (2)

Q28 Please rate how you felt the same day after exercise from 1 to 5 with 1 being the least amount and 5 being the most amount.

	1-none (1)	2- less (2)	3-some (3)	4-more (4)	5-most (5)
Energized (1)	○	○	○	○	○
Focused (2)	○	○	○	○	○
Motivated (3)	○	○	○	○	○
Self-controlled (4)	○	○	○	○	○
Resilient (5)	○	○	○	○	○

Q29 For the following set of questions, please rate the amount that you relate to the following statements:

New ideas and projects sometimes distract me from previous ones. (1)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)
Setbacks don't discourage me. (2)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)
I have been obsessed with a certain idea or project for a short time but later lost interest. (3)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)
I am a hard worker. (4)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)
I often set a goal but later choose to pursue a different one. (5)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)

I have difficulty maintaining my focus on projects that take more than a few months to complete. (6)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)
I finish whatever I begin. (7)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)
I am diligent. (8)	○ Not like me at all. (1)	○ Not much like me. (2)	○ Somewhat like me. (3)	○ Mostly like me. (4)	○ Very much like me. (5)

End of Block: Block 3

Appendix D

Daily Intervention Survey

Start of Block: Default Question Block

Q1 Name (Please use name/nickname from pre-intervention survey):

_____

Q2 What day of the week did you participate in the

▼ Monday (1) ... Friday (5)

Q3 What is today's date?

_____

Q4 Were all of your classes cancelled for today?

- ○ No (1)
- ○ Yes (2)

Display This Question:

If were all of your classes cancelled for today? = Yes

Q5 Please provide proof of all cancelled classes to kjmtthw1@memphis.edu. Screenshots are acceptable forms of proof.

Skip To: End of Survey. Please provide proof of all cancelled classes to kjmtthw1@memphis.edu. Screenshots are acceptable... Is Displayed

Q6 How many classes did you have today?

▼ 1 (1) ... 8 (8)

Q7 Did you skip or miss any classes today?

- No (1)
- Yes (2)

Display This Question:

If Did you skip or miss any classes today? = Yes

Q8 How many classes did you skip today?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)

Display This Question:

If Did you skip or miss any classes today? = Yes

Q9 What reasons did you skip class(es) for?

_____

_____

_____

_____

_____

End of Block: Default Question Block

Start of Block: Sleep

Q10 How many hours of sleep did you get last night? Please round to the closest 30 minutes.

_____

Q11 Did you sleep consistently or inconsistently?

- ○ consistently (1)
- ○ inconsistently (2)

Display This Question:

If Did you sleep consistently or inconsistently? = inconsistently

Q12 What made your sleep inconsistent?

_____

_____

_____

_____

_____

End of Block: Sleep

Start of Block: Nutrition

Q13 How many meals have you eaten today?

_____

Q14 How would you rate your food intake for the day so far with 1 being the least healthy and 10 being the healthiest for you?

	0	1	2	3	4	5	6	7	8	9	10
Healthy Food Intake ()											

Q15 Click to write the question text

	Yes (1)	No (2)
Did you drink any alcoholic beverages the past 24 hours? (1)	○	○
Have you drunk any coffee today? (2)	○	○
Have you drunk 6-8 cups of water minimum today? (3)	○	○

End of Block: Nutrition

Start of Block: Personal Relationships

Q16 Did you have any interactions with a significant other, close friend, or family member today?

- Yes (1)
- No (2)

Display This Question:

If Did you have any interactions with a significant other, close friend, or family member today? = Yes

Q17 Rate your interactions with your significant other, close friend, or family member from 1 for most stressful to 10 for least stressful.

	0 1 2 3 4 5 6 7 8 9 10
significant interactions ()	

Q18 Were there any external factors that affected your mood or experience today?

- Yes (1)
- No (2)

Display This Question:

If Were there any external factors that affected your mood or experience today? = Yes

Q19 Please describe this external factor(s) in as much detail as possible.

_____

_____

_____

_____

_____

End of Block: Personal Relationships

Start of Block: Classes

Q20 Please rate the following topics relating to your classes for the day. Please reference the same class to the same number every day on the daily survey. You may skip lines to keep the same number for the same class, if that number is used for a different class on different days. Put NA if you did not have that class today. Rate Between 1-5 with 1 being the least amount and 5 being the most amount you experienced in that class.

	1- least amount (1)	2- Little amount (2)	3- no experience (3)	4- some amount (4)	5- most amount (5)	NA (6)
Energy (1)	○	○	○	○	○	○
Focus (2)	○	○	○	○	○	○
Participation (3)	○	○	○	○	○	○
Productivity (4)	○	○	○	○	○	○

Carry Forward All Choices - Displayed & Hidden from "Please rate the following topics relating to your classes for the day. Please reference the same class to the same number every day on the daily survey. You may skip lines to keep the same number for the same class, if that number is used for a different class on different days. Put NA if you did not have that class today. Rate Between 1-5 with 1 being the least amount and 5 being the most amount you experienced in that class. "

Carry Forward All Answers - Displayed & Hidden from "Please rate the following topics relating to your classes for the day. Please reference the same class to the same number every day on the daily survey. You may skip lines to keep the same number for the same class, if that number is used for a different

class on different days. Put NA if you did not have that class today.

Q21 :

	1- least amount (1)	2- Little amount (2)	3- no experience (3)	4- some amount (4)	5- most amount (5)	NA (6)
Energy (x1)	○	○	○	○	○	○
Focus (x2)	○	○	○	○	○	○
Participation (x3)	○	○	○	○	○	○
Productivity (x4)	○	○	○	○	○	○

Carry Forward All Choices - Displayed & Hidden from ":"

Carry Forward All Answers - Displayed & Hidden from ":"

Q22 :

	1- least amount (1)	2- Little amount (2)	3- no experience (3)	4- some amount (4)	5- most amount (5)	NA (6)
Energy (xx1)	○	○	○	○	○	○
Focus (xx2)	○	○	○	○	○	○
Participation (xx3)	○	○	○	○	○	○
Productivity (xx4)	○	○	○	○	○	○

Carry Forward All Choices - Displayed & Hidden from ":"

Carry Forward All Answers - Displayed & Hidden from ":"

Q23 :

	1- least amount (1)	2- Little amount (2)	3- no experience (3)	4- some amount (4)	5- most amount (5)	NA (6)
Energy (xxx1)	○	○	○	○	○	○
Focus (xxx2)	○	○	○	○	○	○
Participation (xxx3)	○	○	○	○	○	○
Productivity (xxx4)	○	○	○	○	○	○

Carry Forward All Choices - Displayed & Hidden from ":"

Carry Forward All Answers - Displayed & Hidden from ":"

Q24 :

	1- least amount (1)	2- Little amount (2)	3- no experience (3)	4- some amount (4)	5- most amount (5)	NA (6)
Energy (xxxx1)	○	○	○	○	○	○
Focus (xxxx2)	○	○	○	○	○	○
Participation (xxxx3)	○	○	○	○	○	○
Productivity (xxxx4)	○	○	○	○	○	○

Carry Forward All Choices - Displayed & Hidden from ":"

Carry Forward All Answers - Displayed & Hidden from ":"

Q25 :

	1- least amount (1)	2- Little amount (2)	3- no experience (3)	4- some amount (4)	5- most amount (5)	NA (6)
Energy (xxxxx1)	○	○	○	○	○	○
Focus (xxxxx2)	○	○	○	○	○	○
Participation (xxxxx3)	○	○	○	○	○	○
Productivity (xxxxx4)	○	○	○	○	○	○

End of Block: Classes

Start of Block: Block 5

Q26 Was there anything that prevented you from being able to focus, participate, be productive or have energy during your classes today?

○ Yes (1)

○ No (2)

Display This Question:

If Was there anything that prevented you from being able to focus, participate, be productive or hav... = Yes

Q27 If yes, Please explain.

_____

_____

_____

_____

_____

End of Block: Block 5

Appendix E

Post-Intervention Survey

Start of Block: Default Question Block

Q1 Name:

_____

Q2 Did you complete your intervention? This includes all sessions on days of class within the four-week program period.

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Did you complete your intervention? This includes all sessions on days of class within the four-w... = No

Q3 If no, how many intervention sessions did you attend?

_____

Q4 What grades did you get in each class during the Fall 2021 semester?

	A+ or Pass (1)	A (2)	A- (3)	B+ (4)	B (5)	B- (6)	C+ (7)	C (8)	C- (9)	D (10)	F or no Pass (11)
Class 1 (1)	○	○	○	○	○	○	○	○	○	○	○
Class 2 (2)	○	○	○	○	○	○	○	○	○	○	○
Class 3 (3)	○	○	○	○	○	○	○	○	○	○	○
Class 4 (4)	○	○	○	○	○	○	○	○	○	○	○
Class 5 (5)	○	○	○	○	○	○	○	○	○	○	○
Class 6 (6)	○	○	○	○	○	○	○	○	○	○	○
Class 7 (7)	○	○	○	○	○	○	○	○	○	○	○

Q5 What is your Fall 2021 grade point average (not culminative)?

_____

Q6 What is your culminative grade point average?

_____

End of Block: Default Question Block

Start of Block: Block 1

Q10 Please rate your current state of the following from 1-5 with 1 being the least amount experienced and 5 being the most amount experienced.

	Least experience (1)	less experience (2)	no experience (3)	some experience (4)	most experience (5)
Energized (1)	○	○	○	○	○
Focus (2)	○	○	○	○	○
Motivated (3)	○	○	○	○	○
Self-Controlled (4)	○	○	○	○	○
Resilient (5)	○	○	○	○	○

Q11 For the following set of questions, please rate the amount that you relate to the following statements with 1 being not like you at all and 5 being very much like you.

	1-Not like me at all. (1)	2- Not much like me. (2)	3- Somewhat like me. (3)	4-Mostly like me. (4)	5- Very much like me. (5)
New ideas and projects sometimes distract me from previous ones. (1)	○	○	○	○	○
Setbacks don't discourage me. (2)	○	○	○	○	○
I have been obsessed with a certain idea or project for a short time but later lost interest. (3)	○	○	○	○	○
I am a hard worker. (4)	○	○	○	○	○
I often set a goal but later choose to pursue a different one. (5)	○	○	○	○	○
I have difficulty maintaining my focus on projects that take more than a few months to complete. (6)	○	○	○	○	○
I finish whatever I begin. (7)	○	○	○	○	○

I am diligent. (8)	○	○	○	○	○

End of Block: Block 1

Start of Block: Block 2

Q12 Are you currently takin initiative to exercise?

- ○ Yes (1)
- ○ No (2)

Display This Question:

If Are you currently takin initiative to exercise? = Yes

Q13 What type of exercise did you do?

- ☐ Yoga (1)
- ☐ Cardio (2)
- ☐ Weight Training (3)
- ☐ Sports (4)
- ☐ Running (5)
- ☐ HIIT (6)
- ☐ Walking (7)
- ☐ Other (8)

Q14 Please provide any further insight or experiences you have gained from this intervention regarding your mental health and school.

_____

_____

_____

_____

_____

End of Block: Block 2

Appendix F

Short Grit Scale (Grit-S)

New ideas and projects sometimes distract me from previous ones.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

Setbacks don't discourage me.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

I have been obsessed with a certain idea or project for a short time but later lost interest.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

I am a hard worker.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

I often set a goal but later choose to pursue a different one.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

I have difficulty maintaining my focus on projects that take more than a few months to complete.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

I finish whatever I begin.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.

I am diligent.

- Very much like me
- Mostly like me
- Somewhat like me
- Not much like me
- Not like me at all.