

LET THEM MOVE

Let Them Move: Unleashing the Benefits of Physical Activity for School Children

by  
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Submitted in Partial Fulfillment of the Requirements  
for the Degree of  
Doctor of Education  
in  
Educational Leadership

Youngstown State University  
August 2024

## LET THEM MOVE

Let Them Move: Unleashing the Benefits of Physical Activity for School Children

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**Abstract**

Health organizations recommend children get 60 minutes of daily physical activity. Research has shown that children in the United States of America are coming up well short of this number and are struggling with a variety of mental health and physical health issues while their academics are decreasing. These issues have been magnified by the pandemic that lasted from 2019-2022. The structure of instruction in the classroom and the school day can help increase the amount of physical activity a child receives. The purpose of the study was to see if a relationship existed between Ohio elementary principals' knowledge of the benefits of physical activity and the amount students receive daily. The implications of the findings can be used to increase the amount of daily physical activity of elementary students while at school, so they can reap the benefits. The results of the survey found that most elementary principals were aware of the numerous benefits of physical activity for their students; however, a significant difference was noted between understanding and ensuring students were getting 60 minutes of daily physical activity in their buildings. A variety of barriers to implementation were stated by principals for a lack of implementation. There was a stronger awareness by principals of the mental health benefits when compared to the awareness of the academic benefits. Principals were able to list a variety of benefits provided by regular physical activity. Attention and focus were mentioned as the greatest benefits of physical activity by principals.

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*Keywords:* Fitness, physical activity, anxiety, depression, obesity, mental health, physical health, improved academics, student wellness, movement breaks.

### **Dedication**

Without the support of my family, friends, mentors, and classmates, I would not have been able to accomplish one of the biggest academic accomplishments in my life. To my committee members, especially Dr. Kelly Moran and Dr. Karen Larwin, thank you! Dr. Moran, I was able to see you go through this process yourself and have appreciated your support and encouragement on my doctoral journey. Dr. Larwin, your tenacious attitude about getting things done, and done correctly, is much appreciated. Your high expectations have pushed me to be better in my academic endeavors. I appreciate all the time you have spent with me to complete my dissertation.

To my parents, thank you for being the beacon for my educational journey. I went into the profession because I heard from so many of your former students and families about the positive impact you had on their lives as their teachers. I have always strived to do the same. Your guidance has allowed me to dedicate my professional life to such a meaningful and enjoyable career, while trying to make a positive difference in the lives of others.

To my wife, Michelle, thank you for allowing me to spend the time to write my dissertation and attain my doctoral degree. Your support and understanding have made it possible. Being a teacher yourself, you have always been an amazing listener and provider of feedback to help me be a better educator.

To my children, Reese and Payton, being your dad is the greatest title I have ever had. Thank you for always pushing me to be a better all-around person. Payton, your

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dedication to your own academics has inspired me to do the same. Reese, your dedication and love of what you do inspires me to find joy in my career.

Thank you to my former principal, Dr. Ruth Ann Plate, for seeing more in me than I saw in myself. Your encouragement for me to become a principal, superintendent, and earn my doctoral degree were all a vision you had for me that I did not have for my younger self. I likely would not have achieved any of these accomplishments without your support and mentorship.

Thank you to my YSU classmates, Brandon Kushinski, Courtney Griffiths, and Ariel Hayes, for taking this doctoral journey with me. Completing the online-only doctoral program had its challenges, but the ongoing communication and support we had for each other got us all to the finish line.

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## **Chapter One**

### **Introduction**

Elementary school students in the United States of America are struggling with a variety of issues and challenges. Between 10% to 50% of the time children are in the classroom, they are distracted and unable to focus on a task (Godwin et al., 2016). Out of 252 influences, John Hattie ranks ADHD as having a very negative effect on student learning (Visible Learning, 2017); the pandemic only further widened the achievement gap (Bailey et al., 2021). Anxiety and depression are the most common mental health issues experienced by children (Johnstone et al., 2018), and there was a 24% increase in child mental health issues following the pandemic (Leeb et al., 2020, para 1).

Additionally, the World Health Organization (WHO) believes that in the 21st century, childhood obesity is one of the most important global problems (Yuksel et al., 2020) and is considered to be at an epidemic level in the United States of America (Sanyaolu et al., 2019). Despite all of these issues that elementary school students are facing, the solution that can help minimize their impact is physical activity. The Physical Activity Guidelines for Americans (U.S. Department of Health and Human Services, 2018) and the WHO recommend that children get 60 minutes or more of physical activity each day (WHO, 2020). Despite the recommendations of 60 minutes of daily exercise from a variety of health experts, only 3.8% of elementary schools provide daily physical education (Lee et al., 2007).

If there is overwhelming research that increased physical activity can lessen the numerous challenges facing elementary students while improving their health and academics, why are educators not implementing more of it in schools? School is typically

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a very sedentary time for most children, and a variety of reasons, or excuses, exist for why providing more physical activity at school does not occur. However, research has shown that the principal of the elementary school can have a very positive impact on making this change. Waters et al. (2003) studied principals for 30 years, and found they have a significant effect on student achievement. Principals can make substantial positive changes by influencing the beliefs, attitudes, and conditions in schools (Waters et al., 2003). There was a significant effect size of 0.42 for principals who establish goals and expectations (Waters et al., 2003). The research supports the idea that principals can have a meaningful influence on ensuring students are getting the required amount of daily physical activity by making it a priority in their schools.

As a superintendent of a school district with a focus on the well-being of its students and their academic growth, there have been numerous meetings with other school leaders who have expressed serious concerns about issues regarding their students. Most of the administrators mention that following the pandemic, many students have fallen further behind academically, have dealt with increased behavior issues, and have had more mental health concerns. Numerous programs and added personnel have been proposed to help meet the mental health concerns. Millions of dollars of Elementary and Secondary School Emergency Relief (ESSER) money have been spent to help catch students up and close achievement gaps. Getting students more physical activity is a solution that is rarely proposed and might be in jeopardy of being reduced in schools.

With so much of an emphasis on catching students up academically after the pandemic, there are concerns about the actions that many school leaders will take to close achievement gaps that could have negative impacts on students' physical and mental

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health. When there was increased pressure on schools to close achievement gaps and get test scores up following No Child Left Behind, physical activity was one of the first things to go (Mullins et al., 2019), even though implementing extra physical activity in the school day for 10 to 15 minutes did not have a negative effect on children's academics (Ahamed et al., 2007) and improved working memory (Mora-Gonzalez et al., 2019). School leaders could easily fall back into this trap. Research supports how providing 60 minutes of physical activity to students throughout the day can help to lessen the attention issues, executive function, and improve behavior, all while increasing academic performance (Kohl III & Cook, 2013).

There are decades of research to support the benefits of physical activity for children (Bull et al., 2020; Piercy et al., 2018), but nobody has researched why the recommended 60 minutes a day is not taking place in schools. The current investigation looks at elementary principals' knowledge of the benefits of physical activity for their students. The research also looks at identifying barriers to explain why schools are not implementing 60 minutes of physical activity a day. A survey was sent via email to all of the elementary principals in the state of Ohio. The research and results can be used by school leaders to make changes to the structure and requirements of the elementary school day. It can also be used by legislators to mandate 60 minutes of physical activity each school day, while providing funding to districts for materials and professional development.

### **Problem and Purpose Statement**

This quantitative and qualitative study aimed to understand why students are not getting the recommended 60 minutes of physical activity a day in school by measuring

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elementary principals' understanding of the benefits of physical activity on their students. In addition to studying a principals' understanding of the benefits of physical activity, the study also looked at the barriers to physical activity implementation, the schools' demographics, and the principals' experiences.

Elementary schools in the United States of America are facing a variety of issues and challenges, which is problematic. Behavior concerns, students falling behind academically, students' social and emotional wellbeing (Shannon, 2023) and attention (Godwin et al., 2016) are all concerns. Obesity in children aged 2–19 years has dramatically increased from 5% in the 1960s, to 11% in 1994, to 15% in 2000, to 17% in 2014, and to 19% in 2016 (Anderson & Durstine, 2019). This increase has led to a variety of health issues including diabetes (Gregory, 2019) and high blood pressure and diabetes later in life (Yuksel et al., 2020). Low levels of physical activity and obesity have been associated with poorer executive functioning and brain health (Mora-Gonzalez et al., 2019). Obesity can also affect a child's physical, cardiovascular, and psychological health (Sanyaolu et al., 2019). Physical inactivity is the fourth leading risk factor of premature mortality in adulthood (Aubert et al., 2018, p. 10). Compounding these concerns are the effects of the pandemic on children. Students were less active (Hasson et al., 2023) and a change in daily routines resulted in a 8.7% increase in obesity (Woolford et al., 2021), a 24% increase in child mental health issues (Leeb et al., 2020, para. 1), a widened achievement gap (Bailey et al., 2021), and an increase in anxiety and suicidal ideations in students (Viola & Nunes, 2022).

The time is now to address these numerous issues that elementary school students are facing. There is extensive research to support increased physical activity that can

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reduce many of the physical and mental issues children are facing today. The 2018 Physical Activity Guidelines Advisory Committee Scientific Report found a need for American children to be more active to prevent disease and have better health (Katzmarzyk et al., 2019).

Despite the recommendation from a variety of health experts, such as the World Health Organization (2020), to have 60 minutes of daily exercise, only a small percentage of schools provide daily physical education (Lee et al., 2007). Currently, there is a lack of research exploring why students are not getting 60 minutes of daily physical activity. Research has shown that the principal can be very influential in making positive changes within a school building (Waters et al., 2003). By emailing elementary principals a Google survey, the study examined their knowledge regarding the benefits of physical activity to their students and the barriers that exist to its implementation. The study helps policymakers and decision-makers at schools remove barriers and require more physical activity to take place daily at elementary schools. The research supports elementary students attaining 60 minutes of daily physical activity which could have a life-long positive impact on their physical (Ginis et al., 2021) and mental health (Grasdalsmeon et al., 2020) while also improving their learning (Bedard et al., 2019).

### **Research Questions**

1. Can elementary school principals explain the academic benefits that physical activity provides their students?
  - a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?

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2. Can elementary school principals explain what the mental health benefits of physical activity are for their students?
  - a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?
3. What are the barriers to providing at least 60 minutes daily of physical activity in elementary classrooms?

### **Methodology**

A Google Form survey was utilized in this study and distributed to elementary principals across the state of Ohio via email to assess if students are getting enough physical activity and if principals are aware of the benefits associated with physical activity. Most of the questions were set up on a Likert scale with the option of five choices to measure the respondent's agreement with each statement. The assessment used was self-created and based on the literature associated with the physical activity of students. The survey was piloted with a variety of educators to provide feedback on the format and questions. The feedback was used to update the survey. All Institutional Review Board policies and guidelines were followed.

The population for the study consisted of elementary building principals from the sampling frame of the 611 Ohio public school districts (ODE, 2023). Within the Ohio Educational Department System (OEDS), 1,948 elementary principals were listed, and 902 of them also listed an email address. The Physical Activity Survey was only administered to head elementary school principals, as their email addresses were the only ones listed in OEDS.

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The data was analyzed in SPSS. The association between categorical questions was tested through a series of chi-square tests. In this study, the independent variables of the principals' understanding of the effects of regular exercise on students' academics and mental health were tested to see if there was an association with the amount of physical activity children were getting at the school. Multiple chi-square analogies were completed for each categorical question. The chi-square test of independence answered if there was a difference or association between each category. A chi-square test was also completed to see if there was an association between schools that always meet their 60 minutes of physical activity and the number of barriers that exist at the schools.

### **Significance of the Study**

Elementary students today are facing a variety of problems in addition to falling behind academically, including:

- social-emotional health (Shannon, 2023)
- increased obesity (Anderson & Durstine, 2019)
- poor executive function (Mora-Gonzalez et al., 2019)
- poor cardiovascular and psychological health (Sanyaolu et al., 2019)
- increased mental health issues (Leeb et al., 2020)
- an increase in anxiety and suicidal ideations (Viola & Nunes, 2022)

The study looks at why elementary students are not getting enough daily physical activity in schools when so much research supports its ability to reduce many of these problems children face today (Aubert et al., 2018; Dinkel et al., 2017; Kohl III & Cook, 2013; Sneck et al., 2019). Elementary school principals have the ability to make positive changes in their schools to benefit their students (Waters et al., 2003). There is a gap in



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the literature regarding why elementary students are not getting the recommended 60 minutes of daily physical activity (Bull et al., 2020; Piercy et al., 2018) at school, when the research strongly supports its benefits. The research results better help school leaders and legislators understand the barriers to ensuring students get the recommended amount of daily physical activity while at school. Through school administrators using the findings of this study to make structural changes to the school day that include more physical activity, elementary school students will ultimately benefit. The data provides information to make meaningful changes for physical movement expectations during the typically sedentary school day. These changes could result in better physical and mental health for students, as well as better preparation for them to learn while at school. Future studies can examine the short- and long-term benefits for students who receive the recommended 60 minutes of daily physical activity at their elementary schools.

### **Role of the Researcher**

The researcher was responsible for collecting email addresses of elementary school principals in the state of Ohio. The researcher sent a mass email to all of the elementary principals with the description of the research and a link to the survey. The researcher also sent reminder emails to gain as many responses as possible. The researcher took the data gathered in the Google sheet that was generated from the Google Form Questionnaire and put it into the SPSS program for analysis. The researcher's findings are found in Chapter Four.

### **Assumptions, Limitations and Delimitations**

First, there was an assumption that elementary school principals who believed that the physical activity of students was important would be more likely to have incorporated

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a goal of 60 minutes of daily physical activity for their students. Second, there was an assumption that students from higher socioeconomic schools would be closer to the daily 60 minutes of physical activity. Students from schools with a lower socioeconomic status struggle more academically (Le et al., 2019), and it is assumed that many of those schools cut out activities that are not directly related to learning (i.e., physical activity). This would align with research that children from lower socioeconomic backgrounds demonstrate more sedentary behaviors (Tandon et al., 2021). Lastly, there was also an assumption that most elementary principals knew that physical activity was beneficial for their students' physical health, but they lacked the knowledge that it could also support growth with their academics and social-emotional health.

A variety of potential limitations exist within this study. The elementary school principals surveyed were only from Ohio. Elementary principals from other states or countries were not asked to participate. Even though there were 1,948 elementary school principals listed on the OEDS public school state data system, only 902 listed an email address. Because of limited funds, email was the choice for collecting data versus sending mailers directly to schools.

The boundaries or delimitations of this study were narrowed to focus on a few variables. The study was limited to elementary school principals. The study does not cover the beliefs of other administrators, teachers, legislatures, parents, or the students. If a school is ensuring students are getting 60 minutes of physical activity daily, this study does not include or ask how the school is meeting that goal.

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**Operational Definitions**

A variety of vocabulary words are used throughout this study. The definitions are well documented in existing literature.

*Anxiety:* An emotional state that is related to fear. It becomes a disorder when it lasts over six months, is developmentally inappropriate and interferes with everyday life (Headley, 2013).

*Cardiorespiratory Health:* The ability of the circulatory and respiratory systems to deliver oxygen throughout the body during physical activity (Belcher et al., 2021).

*Depression:* Appears as sadness or dejected mood. Major depression is having five or more symptoms for two weeks or more that include: irritable mood, diminished interest mood in pleasure, loss of energy, insomnia, unable to concentrate, and having suicidal ideations. Persistent depression is having these symptoms most days for at least one year (Wegner et al., 2020).

*Executive Function:* The working memory, inhibition, cognitive flexibility, and planning which are all connected to student learning (Cortés et al., 2019; Sneek et al., 2019).

*Exercise:* The subset of physical activity defined as a structured way to improve fitness (Belcher et al., 2021; Shahidi et al., 2020).

*Mental Health:* The state of well-being that a person can deal with the normal stresses of life and successfully participate in daily life (Andermo et al., 2020).

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*Physical Activity*: Any body movement that increases energy use (Andermo et al., 2020; Belcher et al., 2021; Shahidi et al., 2020). Children should attain 60 minutes of physical activity every day (Bull et al., 2020; CDC, 2022; Piercy et al., 2018).

### **Organization of the Dissertation**

The dissertation starts with an introduction that describes the challenges that elementary students in the United States of America are facing and increasing the amount of physical activity is proposed as a solution. A question is proposed asking, *If there is overwhelming research that increased physical activity can lessen the numerous challenges facing elementary students while improving their health and academics, why is more of it not being implemented in schools?* The significance of the research is stated along with the gap in the literature that currently exists on why students are not getting the recommended amount of daily physical activity while at school. The three research questions are shared along with an overview of the methodology for collecting the data. The significance of the research and the role of the researcher are also described.

The literature review is a comprehensive summary of the current information that exists on the problems that elementary students are facing and the research behind the benefits of physical activity. The headings are broken down by the benefits of physical activity for children, the consequences of low physical activity, as well as trends and recommendations. The chapter ends with a summary of the literature.

The methodology chapter explains the instruments, participants, data collection procedures, data analysis, limitations and delimitations, assumptions, and research ethics used in this study. The online consent form and the physical activity survey are included as well.

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The results section presents the results of the mixed-methods study on Ohio elementary school principals' beliefs regarding the value of providing daily physical activity to their students.

The discussion chapter looks at the interpretation of the findings, the context of the findings, the limitations of the study, a discussion on the future direction of the research, and a conclusion.

## Chapter Two

### Literature Review

Both regular physical activity and a sedentary lifestyle have effects on children. Physical activity (PA) is movement that increases energy use, and exercise is a subset of PA defined as a structured way to improve fitness (Belcher et al., 2021; Shahidi et al., 2020). A child's school day in the United States of America is 63% sedentary (Kuzik et al., 2022), but the structure of a school provides opportunities to support students' overall health (Yale Law School, 2008). Thomas Jefferson not only emphasized education but also the importance of taking breaks to exercise (Yale Law School, 2008). He stated in a letter to Peter Carr in 1785:

In order to assure a certain progress in this reading, consider what hours you have free from the school and the exercises of the school. Give about two of them, every day, to exercise; for health must not be sacrificed to learning. A strong body makes the mind strong.

Because elementary students spend most of their waking hours in school, educators play an integral role in providing necessary physical activity breaks in school (Perera et al., 2015). With the numerous issues facing children (e.g., obesity, diabetes, anxiety, depression, inattention), physical activity provides a means to reduce and improve many of these challenges.

This literature review focuses on the benefits that can come from physical activity and the consequences that are a result of a sedentary lifestyle in children. The current health trends of children are analyzed. The recommended types of physical activity, the duration, and programs are also examined. Lastly, the barriers to physical activity for

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students are discussed, and suggested ideas are provided so that schools can overcome them.

### **The Benefits of Physical Activity for Children**

Regular physical activity has a variety of beneficial short-term and long-term effects on the physical and mental health of both general education students, as well as students with disabilities (Kapsal et al., 2019). Physical activity is defined as “bodily movement performed by skeletal muscles that demand energy expenditure” (Shahidi et al., 2020, p. 1), while exercise is defined as structured and repetitive movement that improves physical fitness (Donnelly et al., 2016 p. 2). The benefits of physical activity and exercise include improved physical health, better cognitive and mental health, a more positive self-body image, better self-esteem, and improved academics (Aubert et al., 2018; Sneck et al., 2019).

#### ***Physical Health***

Children who engage in regular physical activity benefit from increased bone density (Caldwell et al., 2020; Chaput et al., 2020; Pangrazi & Beighle, 2019), good blood pressure (Caldwell et al., 2020), improved cardiovascular health (Caldwell et al., 2020; Chaput et al., 2020; Yuksel et al., 2020) and muscular fitness (Caldwell et al., 2020; Chaput et al., 2020), as well as coordination (Shahidi et al., 2020). Exercise increases metabolism, leads to weight loss (García-Hermoso et al., 2020; Mohammad et al., 2019), helps children maintain a healthy body weight (Pangrazi & Beighle, 2019), and can reduce obesity in children and adolescents (Brown et al., 2019).

When compared to physically-inactive children, physically-active children are more likely to remain active into adulthood and garner the health benefits (Pangrazi &

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Beighle, 2019). Physical activity can reduce the risk factors associated with many diseases like obesity and diabetes (Pangrazi & Beighle, 2019), and high blood pressure (Wu et al., 2019; Yuksel et al., 2020). Additionally, lower mortality rates are associated with moderate physical activity levels (Anderson & Durstine, 2019). Physically-active children have both immediate and long-term health benefits.

**Cardiorespiratory Health.** Cardiorespiratory fitness is the ability of the circulatory and respiratory systems to deliver oxygen throughout the body during physical activity (Belcher et al., 2021). Physical activity in children, as young as preschool age, has shown to improve cardiorespiratory fitness (García-Hermoso et al., 2020). Cardiorespiratory endurance is related to a child's body mass index (BMI) (Mintjens et al., 2018), waist circumference, and prevalence of metabolic syndrome (Fühner et al., 2021). Physical activity and exercise may prevent high blood pressure and cardiovascular disease (Wu et al., 2019; Yuksel et al., 2020) while improving vascular health in children (Köchli et al., 2019). Cardiorespiratory fitness is important to mental health (Lubans et al., 2016) and the academic achievement (Santana et al., 2017) of children.

**Muscle Strength and Endurance.** Exercise has a positive influence on the physical development of children (Minghetti et al., 2021). Positive associations have been found between muscle strength and BMI, insulin resistance, reduced cardiovascular disease, and bone mineral density (Fühner et al., 2021). Muscle strength is also beneficial for a child's motor skill development (Fühner et al., 2021). Muscle endurance and strength can be improved with both resistance (Stricker et al., 2021) and non-resistance exercises (Wu et al., 2021). Yoga and stretching exercises lead to increased abdominal



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strength, improved posture, and endurance in primary-aged students (Malar & Maniazhagu, 2020).

### ***Mental Health***

Physical activity is associated with better mental health in children (Sampasa-Kanyinga et al., 2020). Anxiety disorders (Headley, 2013) and depression are the most common mental health issues experienced by children (Johnston et al., 2018) and are more common in obese children compared to their peers with normal weight ranges (Lindberg et al., 2020). Depression in children can increase their risk of suicide (Wegner et al., 2020). One study found that 46% of students were suffering from abnormal anxiety and 24% with abnormal depression (Basheti et al., 2023). Children who experience high levels of anxiety can have relationship issues with classmates and parents, as well as lower academic achievement (Headley, 2013). Physical activity reduces anxiety (Terado, 2018), the risk of depression, and the amount of depressive symptoms experienced in children (Chaput et al., 2020; Kapsal et al., 2018), including major depression (Wegner et al., 2020). Physical activity changes the chemical makeup of the brain and leads to positive emotions (Fiscal, 2021). Increasing the intensity of exercise results in a lower risk of mental health problems (Grasdalsmeon et al., 2020). Teaching movement and sport skills benefit both physical and mental health (Kapsal et al., 2018). Fiscal (2021) found a connection between balance and high levels of anxiety in children, as improving balance issues in children can significantly reduce anxiety and increase self-esteem.

**Executive Function.** Executive function consists of working memory, inhibition, cognitive flexibility, and planning which are all connected to student learning (Cortés et al., 2019; Sneck et al., 2019). Executive function is a cognitive process that involves

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scheduling, monitoring a complex task or goal that involves perception, memory, and action (Donnelly et al., 2016). Executive functions are predictors of academic performance and possible learning problems for a student (Donnelly et al., 2016). Moradi et al. (2019) found that children who participated in cognitively engaging activities (e.g., sports and group activities) had a larger positive impact on their executive function compared to students who participated in non-cognitively engaging exercises such as repetitive aerobic exercises.

**Attention and Behavior.** Loss of instructional time for students having off-task behavior has been a recognized problem for over 100 years (Lemov, 2010) and has a negative impact on student achievement (Godwin et al., 2016). Elementary students tend to be distracted between 10% and 50% of their time in the classroom which makes it difficult to focus on the teacher or attend to the required task (Godwin et al., 2016). In the classroom, female students are on task and focused more often than male students, but the focus levels for all students declines over the length of the lesson (Godwin et al., 2016).

Attention-deficit hyperactivity disorder (ADHD) is a neurological disorder that is represented by inattention, hyperactivity, and impulsivity, and it is found in 5% of children (Mechler et al., 2022). In a study from Fiscal (2021), she shared that the Centers for Disease Control and Prevention (CDC) reported that 10% of the children, aged two to 17, had a diagnosis of ADHD. Half of these children were also diagnosed with behavior or conduct disorders (Fiscal, 2021). Out of 252 influences, John Hattie ranks ADHD as the most negative effect on student learning at a -90 (Visible Learning, 2017). Physical activity reduces the symptoms of ADHD in children (Sun et al., 2022) and can improve cognitive performance (Christiansen et al., 2019; Liang et al., 2021). Cross-lateral

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movement involves coordination movements from both sides of the body and increases blood flow to the brain which improves focus and concentration (Fiscal, 2021). Exercise intervention improves the executive function, inhibitory control, and cognitive flexibility of children and adolescents with ADHD (Liang et al., 2021). Stimulant prescription amounts have steadily increased to treat ADHD (Torres-Acosta et al., 2020). However, Torres-Acosta et al. also state that ADHD medications should only be prescribed after regular exercise has been tried first. Physical activity can improve attention without any negative side effects (Sun et al., 2022).

Following moderate to intensive exercise, students' behaviors improve which allow students to spend more time on task (Daly-Smith et al., 2018; Masini et al., 2020; Pangrazi & Beighle, 2019; Sneek et al., 2019; Sun et al., 2022), particularly for boys (Watson et al., 2019). One study showed that after 10 minutes of physical activity with fourth and fifth graders students, on-task behavior improved (Howie et al., 2014). Other studies showed that even small bursts of physical activity, or brain breaks, improved attention (Hasson et al., 2023; Terado, 2018), cognitive performance, and educational outcomes such as standardized test scores, reading literacy scores, and math fluency scores (CDC, 2014). Physical activity reduces off-task behavior (Bartholomew & Jowers, 2011), especially for the children who are most off-task (Webster et al., 2015). Short breaks even work for the youngest learners. Classroom physical-activity-based breaks that are 10 minutes long and done twice a week in a preschool setting improve attention (Webster et al., 2015). Ninety-one percent of teachers feel that brain breaks help with students' concentration (Perera et al., 2015) and report fewer students who lack effort and motivation (Carlson et al., 2015). A brain break is the opportunity for the brain to move

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away from the routine in the classroom of learning and problem solving for a few minutes and often incorporates some type of physical activity (Desautels, 2016). Taking a brain break, even before the last subject of the day, can improve student engagement between 17% and 40% (Tatum, 2019).

### **Effects of Physical Activity on Learning**

Physical activity affects the brain and supports learning. Physical activity helps provide the brain with more oxygen, grows the hippocampus (Terado, 2018), and creates more volume in the prefrontal lobe and the medial temporal cortex which controls thinking and memory (Pangrazi & Beighle, 2019). According to Bedard et al. (2019), acute exercise improves cognition through increased blood flow and neurochemical responses. Physical activity breaks improve academic and cognitive functions such as creativity, concentration, math competence, and ideational fluency (Dinkel et al. 2017; Tilp et al., 2020).

Integrating movement into classroom instruction and curriculum improves the learning for most students (Bedard et al., 2019). Movement increases activation of the prefrontal networks which may lead to improved learning (Bedard et al., 2019). Physical activity breaks, with and without integrating math materials, were beneficial to improving on-task behavior and academic scores in children (Mavilidi et al., 2020; Sneck et al., 2019). Students who received aerobic-only movement breaks outgained students in reading achievement who had only academic breaks (Fedewa et al., 2018). Using programs like GoNoodle to promote physical activity during classroom breaks have been shown to positively affect students' reading fluency (Wold, 2019). Incorporating movement into the actual lessons is enjoyable to students and positively affects their

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learning (Bedard et al., 2019). Creative performance has improved in students who participate in aerobic games for 45 minutes (Tilp et al., 2020). Mora-Gonzalez et al. (2019) shared how an intervention of 70 minutes of moderate to vigorous physical activity resulted in improved working memory of children. Physically-active children outperform physically-inactive children academically (Castelli et al., 2007; Trudeau & Shephard, 2008) and show a better working memory than lower-fit children (Mora-Gonzalez et al., 2019). The academic benefits from physical activity outweigh the benefits of increasing learning time in subjects like reading and math (Fiscal, 2021).

### **Students with Disabilities**

Children with disabilities face a variety of challenges to be physically active because of their physical restrictions and their environment. Students with Autism Spectrum Disorder (ASD) are more likely to avoid activities that include social skills and communication (Pushkarenko et al., 2021). Students with ASD are at an increased risk for chronic disease and poorer quality of life due to being less physically active (Pushkarenko et al., 2021). Students with intellectual disabilities are less likely to engage in physical activity when compared to their typical peers; therefore, they are more overweight, obese, have poorer motor control, and are less fit than their typical peers (Kapsal et al., 2019). Children with intellectual disabilities have very low physical fitness levels and are in urgent need of programs to support increasing their physical activity (Wouters et al., 2020). Children with intellectual disabilities are three times more likely than their typical peers to be anxious and two times more likely to experience depression (Kapsal et al., 2019). Children with epilepsy have poor physical literacy scores, worse

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agility, low muscular endurance, and have reported more screen time when compared to their typical peers (Pohl et al., 2019).

The WHO recommends students with disabilities engage in at least 150 minutes of physical activity a week (Theis et al., 2021). Physical activity has a positive impact on cardiorespiratory fitness, muscular strength, and functional skills for people with physical or cognitive disabilities (Ginis et al., 2021). The 150 minutes per week is sufficient for children with disabilities to improve mental health which includes improving perception of confidence and self-esteem (Theis et al., 2021). Students with learning disabilities often have difficulties with movements that involve crossing the midline, so cross-lateral movements are recommended (Fiscal, 2021). Activating both sides of the brain helps to improve skills that students are lacking including learning activities like reading and writing (Fiscal, 2021).

Physical activity has numerous benefits for students with a variety of disabilities. Students with ASD who participated in physical activity interventions showed improvement in sleep efficiency, sleep onset latency, and sleep duration (Tse et al., 2019). Those with multiple sclerosis, spinal cord injuries, Parkinson's disease, schizophrenia, and/or stroke showed improved cognition and quality of life when their physical activity levels increased (Ginis et al., 2021). Students labeled as emotionally disturbed showed improved on-task behavior after practicing mindfulness (Rosholt, 2021).

Kapsal et al. (2019) shared that the type and severity of the disability influenced the overall improvements that physical activity provided to the child's health. For example, children with severe ID showed a greater improvement in their physical health

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when compared to students with mild ID (Kapsal et al., 2019). Children with developmental disabilities (e.g., ASD, down syndrome) had more psychosocial (e.g., self-esteem and mental health related) benefits from the physical activity compared to students with ID (Kapsal et al., 2019).

### **Consequences of Low Physical Activity on Children**

The WHO believes that in the 21st century, childhood obesity is one of the most important global problems (WHO, 2020) and is considered to be at an epidemic level in the United States of America (Sanyaolu et al., 2019). In the United States, obesity in children has dramatically increased over the last seven decades (Anderson & Durstine, 2019). Physical activity in children decreases with age, particularly around ages 6-7 (Carrasco-Uribarren et al., 2023) and further declines as children transition into adolescence according to (Abi et al., 2018). Obesity rates are higher in ethnic minorities and in households with a lower socioeconomic status (Tsoi et al., 2022). Children from low-resource communities have even lower rates of physical activity (Wolfe et al., 2020), which puts them at risk of the negative consequences associated with sedentary lifestyle such as obesity, diabetes, and cardiovascular disease (Dunton et al., 2020). Concerns about obesity are not isolated to the United States of America. The WHO European Region found that one in three 11-year-old children were overweight or obese, and predicted that over 60% of children who are obese before puberty will become overweight in adulthood (Nittari et al., 2019).

Children who are inactive are subject to poorer health (Chaput et al., 2020; Moradi et al., 2019) and obesity (Invernizzi et al., 2019). Obesity has health consequences that include issues with insulin and type two diabetes (Gregory, 2019).

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Inactivity may lead to high blood pressure and diabetes later in life (Yuksel et al., 2020).

A connection has been made between sedentary screen time and poorer mental health (Biddle & Asare, 2011). Sedentary behavior, which includes screen time, should be limited to no more than two hours a day (Chaput et al., 2020). Students with disabilities often are less physically active which results in poorer health (Kapsal et al., 2019). Low levels of physical activity and obesity has been associated with poorer executive function and brain health (Mora-Gonzalez et al., 2019). Obesity can also affect a child's physical, cardiovascular, and psychological health (Sanyaolu et al., 2019). Physical inactivity is the fourth leading risk factor of premature mortality in adulthood (Aubert et al., 2018, p. 10).

### ***Negative Cardiorespiratory Health***

Physical inactivity may cause poor cardiovascular fitness with an increase in high blood pressure (Yuksel et al., 2020). Children are more prone to hypertension and high blood pressure from being obese (Anderson & Durstine, 2019). Hypertension in youth has been the result of children being overweight (Köchli et al., 2019). Children who are overweight and obese have been found to have elevated bad cholesterol as well (Anderson & Durstine, 2019; Yuksel et al., 2020). Overweight and obese children were found to have narrower and stiffer arteries (Köchli et al., 2019). Those with low cardiorespiratory fitness were associated with having a lower health related quality of life (Evaristo et al., 2019).

### ***Negative Muscle Strength and Endurance***

The decline in the muscular fitness level of children is likely caused by decreased fitness levels (Sandercock & Cohen, 2019). Physically-inactive children have low muscular fitness levels and are at a higher risk of continuing with low fitness levels into



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adulthood which can lead to chronic diseases later in life (Smith et al., 2019). Low muscular fitness is associated with a low health related quality of life (Evaristo et al., 2019).

### **The COVID-19 Pandemic**

The COVID-19 pandemic closed down activity all over the world. In the Spring of 2020, many parts of the United States closed recreation parks, gyms, and pools which put a stop to indoor and outdoor sports (Shahidi et al., 2020). This had a negative impact on physical activity for children (Puccinelli et al., 2021). Many regular activities that provided movement opportunities for children simply stopped (Shahidi et al., 2020). Many schools closed and offered full or partial remote learning for the 2020-2021 school year; some provided online physical education (OLPE) (Webster et al., 2021). Families played a key role in the amount of physical activity students had while participating in OLPE (Rhodes et al., 2020). Physical education teachers in rural settings, when compared to urban and suburban settings, felt their students had the lowest amount of access to technology and rated themselves as least effective with OLPE (Mercier et al., 2021).

The pandemic caused health concerns unrelated to the virus. There was a 17-minute decline in the amount of daily moderate-to-vigorous physical activity attained (Neville et al., 2022). During the school closures that resulted from the pandemic, physical activity routines and eating habits of children and adolescents (Stavridou et al., 2021) changed and led to a 8.7% increase in obesity (Woolford et al., 2021). Other negative results included a 24% increase in child mental health issues (Leeb et al., 2020, para. 1) and a widened achievement gap (Bailey et al., 2021). Besides a decrease in physical activity, other issues like social distancing, isolation, family violence,

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quarantines, decreased sleep quality, and loss of time in school also contributed to increased anxiety and suicidal ideations in students (Viola & Nunes, 2022).

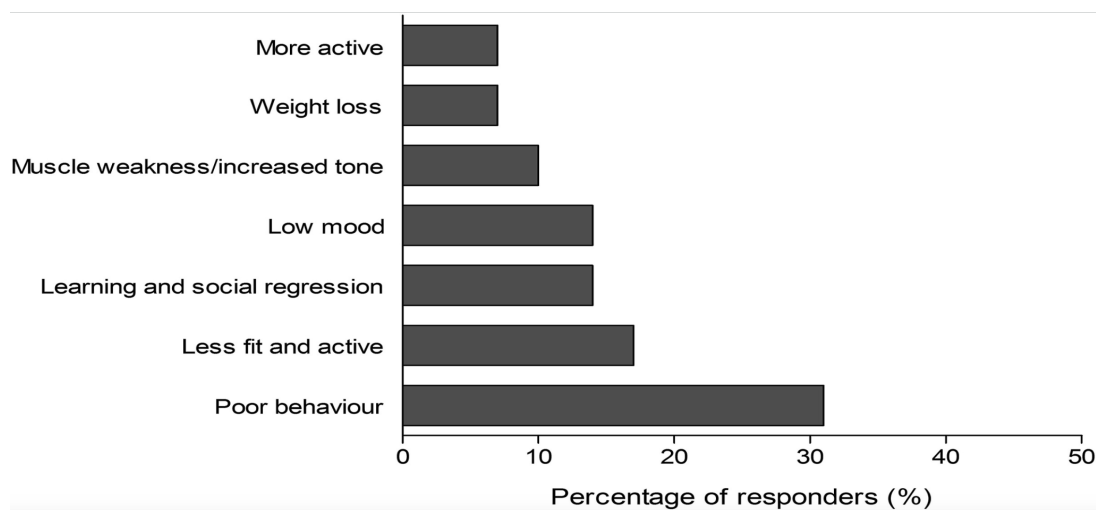
Coming out of the pandemic, a need is recognized to increase physical activity to improve the health and achievement of students (Hasson et al., 2023). Not meeting the physical activity needs of children will have the increased costs (Carlson et al., 2015) of poor mental and physical health of adolescents (Biddle & Asare, 2011) and premature mortality in adulthood (Lee et al., 2012).

Parents of children with disabilities reported that during the pandemic their children were less physically active which led to 90% of them reporting a negative impact on their child's mental health (Theis et al., 2021). As a result of less physical activity, parents reported an increase in behavioral problems (e.g., aggressive, self-harming, and anxious behaviors) as noted below in Figure 1 (Theis et al., 2021).

Disparities existed for students with disabilities, based on the disability, when trying to access the OLPE during COVID-19 pandemic (Webster et al., 2021).

### Figure 1

*The Reported Impacts of Lockdown on Children and Young Adults with Disabilities*



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### Stress and Anxiety

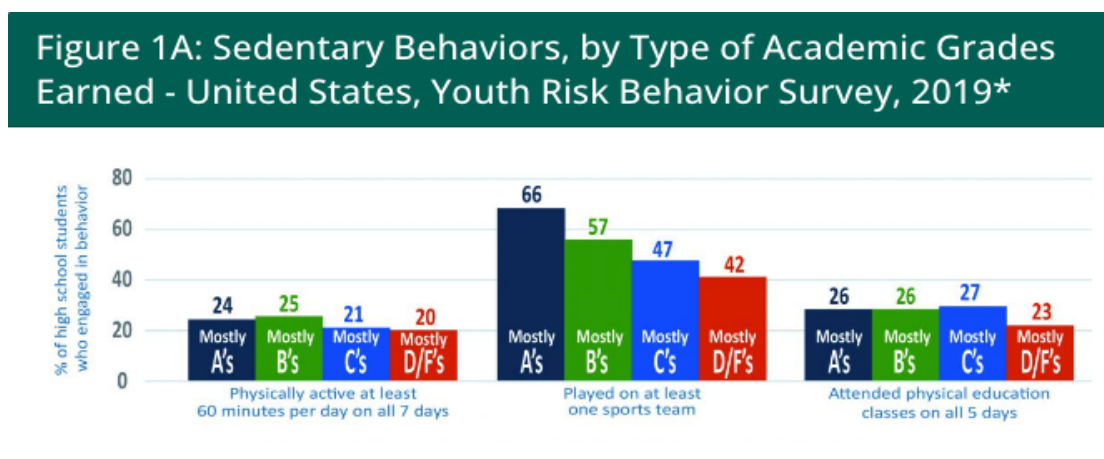
A sedentary lifestyle of playing video games and screen time is associated with behavior and social issues (Chaput et al., 2020; Sampasa-Kanyinga et al., 2020) that include depressive symptoms and psychological distress (Andermo et al., 2020). Sedentary behavior is also associated with children's happiness and general satisfaction with life (Rodriguez-Ayllon et al., 2019). Both females and males with low levels of physical activity were more likely to self-report higher scores of depression (Grasdalsmeon et al., 2020). Those experiencing depression early in life often experience a wide range of negative behaviors later in life (i.e., substance abuse, violent behavior, and criminal charges) (Sampasa-Kanyinga et al., 2020).

### Negative Effects on Learning

Negative consequences for learning are often a result of children who are inactive. Their sedentary behaviors lower cognitive and academic performance (CDC, 2021; Guirado et al., 2021; Kontostoli et al., 2021). Figure 2 below shows the correlation between activities and academic grades.

### Figure 2

#### *Sedentary Behaviors by Type of Academic Grades Earned*



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Figure 2 shows the results of a survey based on the relationship between grades and movement found in physical activity, sports, and attending physical education class on all five days (CDC, 2021). The more physically active students are during the day and the more sports they play, the higher their academic grades (CDC, 2021).

### **Trends and Recommendations**

Professional health organizations have made recommendations on the amount of physical activity that should take place during the day and have expressed concerns about the lack of movement of children (Chaput et al., 2020; Moradi et al., 2019). The 2018 Physical Activity Guidelines Advisory Committee's scientific report found a need for American children to be more active to prevent disease and have better health (Katzmarzyk et al., 2019). *The Physical Activity Guidelines for Americans* and the WHO recommend that children get 60 minutes or more of physical activity each day (Bull et al., 2020; Piercy et al., 2018), as well as muscle and bone strengthening three times a week (Chaput et al., 2020; Fühner et al., 2021). The recommendation for elementary students is to have 30 minutes, or more, of daily *moderate to vigorous* physical activity that can come from physical education class, recess, classroom activities, and/or before-or-after-school programs (Carlson et al., 2015).

### **Physical Activity in Schools**

Schools can have a valuable role in increasing the amount of physical activity children receive. Schools that intentionally provide movement during the school day meet the children's needs for movement (Fiscal, 2021). Based on research, these students will show more interest in learning while feeling calmer, more focused (Howie et al., 2014), and alert (Fiscal, 2021). The CDC recommends that teachers provide five to 15 minutes

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of physical activity in their classrooms (Centers for Disease Control and Prevention, 2018). The most likely physical activity breaks to be implemented by teachers in the classroom are five minutes or less (McMullen et al., 2014).

Since there is a drop off in physical activity in children around the age of six or seven, primary schools are the key to increasing and promoting physical activity (Carrasco-Uribarren et al., 2023). Forty-two percent of children aged 6-11 get the recommended 60 minutes of physical activity a day (Troiano et al., 2008). Despite the recommendation from a variety of health experts to have 60 minutes of daily exercise, only 3.8% of elementary schools, 7.9% of middle schools, and 2.1% of high schools provide daily physical education (Lee et al., 2007). Only 24% of children ages six to 17 get 60 minutes of physical activity a day (CDC, 2022).

The Physical Activity Alliance (2022) produced a report card that assessed levels of physical activity, sedentary behaviors, barriers to physical activity, and health outcomes for children in the United States (pp. 3-4). Their 2022 report card gave a grade of a “D-” for *overall physical activity* (Physical Activity Alliance, p. 3). They found that 42% of U.S. children ages 6-11 are meeting the recommendation of 60 minutes of daily physical activity, but that number drops significantly to 15% for children ages 12-17 (Physical Activity Alliance). The Physical Activity Alliance gave a “D” for *active transportation* (p. 3). They found that only 38% of youth, ages 12 to 19, walk or bike once a week to different places in their community. Only 11% of children, ages five to 18, walk or bike to school. The Physical Activity Alliance gave a grade of a “D” for *sedentary behaviors* (p. 3). They found that only 20% of children, ages six to 19, follow

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the recommended guideline of two or less hours of screen time a day (Physical Activity Alliance, 2022).

### *Implications for Educators*

Today, educators take on a variety of roles in the classroom. They also face a variety of challenges in the classroom that include behavior concerns, students falling behind academically, students' social and emotional wellbeing (Shannon, 2023), and attention (Godwin et al., 2016). All these concerns, and more, can all be supported through a variety of physical activities that can be integrated into the school day (Fiscal, 2021; Terado, 2018). Families and schools need to collaborate to find ways to increase physical activity opportunities for children (Mullins et al., 2019).

### **Types of Physical Activity**

A variety of physical activities (i.e., resistance training, sports, yoga, and exercise) have been shown to benefit children. Providing physical activity breaks should be part of the instructional process, not a reward (Fiscal, 2021). Knowing which types of exercises and the recommended duration for children are beneficial for schools. Students may enjoy physically-active lessons compared to sedentary ones which positively affect their mood, learning (Bedard et al., 2019), and social skills (Terado, 2018). There are several types of physical activity that can be incorporated into the school day.

### *Curriculum and Movement Combined*

Students who engage in physical activity, while also engaging in cognitive tasks, show the most achievement in their academic performance (Egger et al., 2019; Schmidt et al., 2015). Their executive functioning also improves (Schmidt et al., 2015).

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### *Mindfulness*

Mindfulness is a practice of focusing attention through meditation, yoga, and breathing exercises while being aware of one's bodily sensations (Leland, 2015).

Including movement in mindfulness practices has shown better improvement in executive function of children when compared to physical activities without mindfulness or mindfulness when stationary (Diamond & Ling, 2020). Improved self-control of students with low executive function skills is also a result (Pekari, 2022). Practicing mindfulness has proven to improve student self-regulation, behavior, cognitive improvement, as well as lowered anxiety and depression (Rosholt, 2021). Mindfulness is a way for students to realize what is going on inside and outside their bodies (Pekari, 2022). Mindfulness has both physical and mental health benefits (Pekari, 2022). Mindfulness has a positive impact on academic performance, focus, organization, exam performance, critical thinking, problem solving, impulse control, and reducing stress including for those with learning disabilities (Leland, 2015).

### *Breaks*

Both passive and physically-active breaks provide a significant positive effect on attention (Janssen et al., 2014). However, the most productive and impactful type of break is the one with moderate physical activity involved (Janssen et al., 2014).

Classroom physical activity breaks (CPABs) for children with asthma reduced disparities in physical activity participation (Beemer et al., 2018). Kindergarten rooms that had kinesthetic learning and brain breaks had students with better on-task behavior, self-regulation skills, and cognitive growth (Fiscal, 2021).

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### *Agility Training*

Agility training improves both cardiorespiratory fitness and cognitive skills that include working memory and sustained attention, rather than traditional physical training (Moradi et al., 2019).

### *Motor and Coordination*

Providing motor and coordination exercises during a morning break improves both academic and cognitive functions (Tilp et al., 2020). For improving psychosocial and physical health for students with ID, it is more beneficial to provide sport and movement skills training over general physical education activities (Kapal et al. 2019). Cross-lateral movement, or the coordination of movement on both sides of the body, helps with concentration (Fiscal, 2021).

### **School Programs that Promote Physical Activity**

A large contributor to sedentary behavior in children is the time spent inside the classroom (Norris et al., 2020). Children sit for an estimated four-and-a-half hours during the school day (Flippin et al., 2021). Many schools only offer 15-20 minutes per day of moderate-to-vigorous physical activity (Carlson, et al., 2015).

Physical literacy is a child's understanding and knowledge of the value of physical activity (Caldwell et al., 2020). Physical literacy is based on four categories:

- affective (i.e., motivation and confidence)
- physical (i.e., effective interaction in different settings)
- cognitive (i.e., knowledge and understanding)
- behavioral (i.e., lifelong) (Caldwell et al., 2020; Tremblay et al., 2018)



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Physical literacy allows the child to practice the skills needed for physical activity, engage often in physical activity, as well as know the benefits of physical activity (Invernizzi et al., 2019). With the goal to promote physical activity that will continue with students throughout their life, physical literacy should start at an early age (Liu & Chen, 2021).

Physical activity breaks can take place inside and outside the classroom (Terado, 2018) in a whole-school approach (Dinkel et al., 2017). Since 2008, comprehensive school physical activity programs (CSPAP) have been around to supplement physical education classes (Webster et al., 2020). The goal of the CSPAP was to have students meet academic standards *and* the recommended 60 minutes of daily physical activity (Webster et al., 2020). The CSPAP programs evolved over time but consisted of five main areas: physical education, physical activity during school, physical activity before and after school, staff involvement, and family and community engagement (Drinkel et al., 2017; Webster et al., 2020). While there are five areas suggested, a school can still meet their physical activity goals by only implementing a few of the areas (Webster et al., 2020).

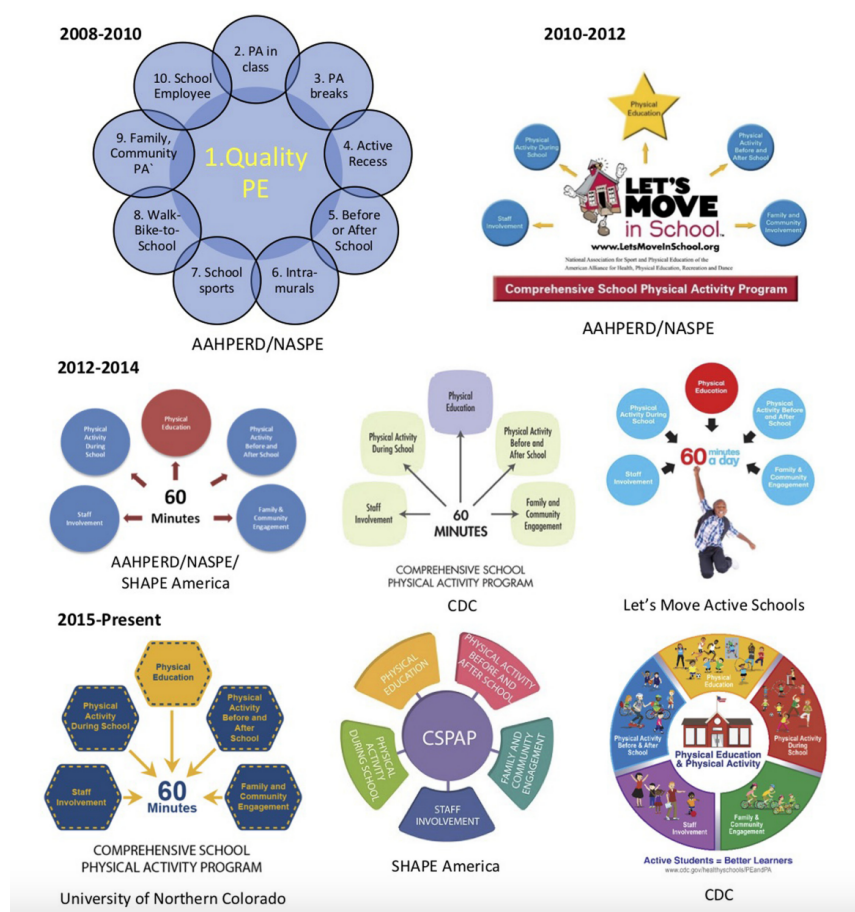
A variety of comprehensive school physical activity programs have evolved over time. From 2008-2010, the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD/NASPE), which is now Society of Health and Physical Education (SHAPE) America, existed. From 2010-2012, the AAHPERD/NASPE program was morphed into the “Let’s Move in School” program (Webster et al., 2020). From 2012-2014, the AAHPERD/NASPE/SHAPE America had a comprehensive plan to get students to achieve the recommended 60 minutes of movement a day (Webster et al.,

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2020). From 2015 to the present, the CDC and SHAPE America have proposed a comprehensive and whole-school physical activity framework with the goal of students achieving 60 minutes of moderate-to-vigorous activity every day (Drinkel et al., 2017; Webster et al., 2020). See Figure 3 below for the timelines and areas of the CSPAP.

**Figure 3**

*Evolution of Comprehensive School Physical Activity Programs (CSPAP)*



The Interrupting Prolonged Sitting with Activity (InPACT) is a low-cost program that aims for teachers to create a culture of wellness in the classroom (Beemer et al., 2018). The program breaks up sit-time with 10, three-minute-activity breaks during a

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school day (Beemer et al., 2018). Teachers are provided with instructional materials, equipment, professional development, tips on how to set up their classroom, and health training to support students with physical conditions like asthma (Beemer et al., 2018). While the goal was 10 breaks a day, the average number implemented by teachers was five (Beemer et al., 2018).

A means to provide children with the necessary physical activity is to integrate it into the classroom (Bedard et al., 2019). Spending more time on physical activity does not have a negative effect on academic achievement (Ahamed et al., 2007). The combination of physical activity with core-content academics (Dinkel et al., 2017) meets the needs for covering the curriculum but also engaging in physical activity (Bedard et al., 2019). Providing motor and coordination type exercises during a morning break improves both academic and cognitive functions (Tilp et al., 2020).

Implementing a classroom based physical activity program at the school increases the number of steps students are taking daily (Calvert et al., 2018). Examples of programs that have physical activity integrated with curriculum are Happy 10, Take 10!, Physical Activity Across the Curriculum, The Class Moves, Texas Initiatives for Children's Activity and Nutrition (I-CAN!), Activity Bursts in the Classroom, Instant Recess, FUNtervals, and Kinder-Sportstudie (KISS) (Beemer et al., 2018). Circus arts provide activities like acrobatics, manipulation, equilibrium, and aerial skills which have led to improved motor skills and confidence (Shahidi et al., 2020). Having the necessary materials are essential to a classroom-based physical activity program. Kinesthetic equipment (Flippin et al., 2021) like active desks, cycling desks, and stability balls all help reduce sedentary behaviors in the school environment (Guirado et al., 2021).

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***Barriers to Providing Regular Physical Activity to Elementary-Age Students***

While they may have great intention to implement them, less than 50% of teachers provide regular physical activity breaks for their students (Densley et al., 2021). Of those 50%, the students often receive less than an average of 10 minutes of daily physical activity (Densley et al., 2021). Teachers state that barriers to offering movement breaks in the classroom had to do with lack of equipment, (Densley et al., 2021) classroom management, space constraints, returning to academic tasks (McMullen et al., 2014), teacher training (Carlson et al., 2017; Flippin et al., 2021), lack of administrative support (Carlson et al., 2017; Hasson et al., 2023), and lost time for curriculum (Beemer et al., 2018; Carlson et al., 2017; Dinkel et al., 2017). Not having staff that act as champions for wellness are also barriers to physical activity for students (Carlson et al., 2017; Densley et al., 2021).

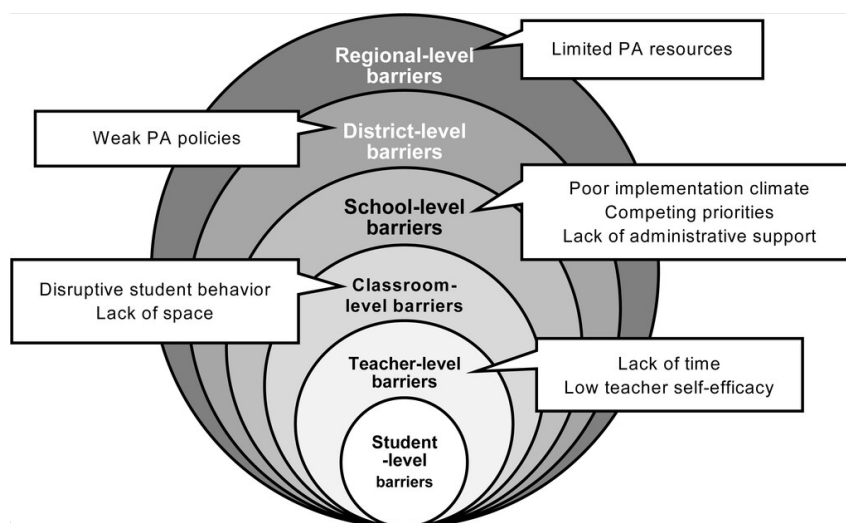
Because of pressure to cover content (Dinkel et al., 2017), teachers prefer to provide activity breaks that reinforce academic content because they are easy to use and do not require pre-activity preparation (McMullen et al., 2014). Teachers report they do not have the time for anything additional in their classrooms (Flippin et al., 2021), and they are already overwhelmed with things to do (Bedard et al., 2019). Five years after the No Child Left Behind Act (NCLB) of 2001, 44% of school districts reduced non-core subjects and recess by an average of 30 minutes a day (Mullins et al., 2019). This was done in an effort to provide more time for core subject areas because of the numerous accountability measures that were put in place with NCLB (Mullins et al., 2019). NCLB was replaced in 2015 with the Every Student Succeeds Act (ESSA) which continues to have low physical activity implementation taking place with students (Brener et al.,

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2017). Figure 4 below shows the barriers that exist for teachers to implement physical activity interventions.

**Figure 4**

*Multilevel Implementation Barriers to Classroom-Based Physical Activity (Hasson et al., 2023)*



Barriers to participating in CPABs are not coming from the students (Mullins et al., 2019). Students report “CPABs were very fun (86%), provided them with a nice break during the school day (88%), were very good for their health (94%), helped them feel more ready to learn (71%), and learn better (50%)” (Mullins et al., 2019, p. 1). According to one brain break survey, 95% of students were excited and engaged during the stretching and relaxation segments of the brain breaks (Perera et al., 2015).

Despite endorsement and support from organizations like Nike, the National Academy of Medicine and the WHO, adoption of a CSPAP is still very low (Webster et al., 2020). Very few school districts have a CSPAP due to a lack of policy and support at the state level (Webster et al., 2020). The federal government does not offer incentives

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for states to adopt a policy, so it is left to the schools to decide (Webster et al., 2020).

Without discounting the importance of the physical education program, the involvement of other stakeholders (e.g., classroom teachers, administrators, parents, and others) is needed for the CSPAP to be successful (Webster et al., 2020).

Equity concerns exist for students who may not have equal access to physical activity within the school. Students in low-resource schools, who are in the greatest need of physical activity breaks, are the least likely to receive them in their classrooms (Acosta et al., 2021; Carlson et al., 2017; Weaver et al., 2018). For children with disabilities, parents have named lack of programs, lack of time, and the child's disabilities as barriers to physical activity (Columna et al., 2020).

### **Overcoming the Barriers to Implement Physical Activity for Students**

While barriers exist to increasing the physical activity of students in schools, finding a way to make children more physically active is essential to reducing obesity, as well as investing in the future of children's health (Nittari et. al., 2019). To encourage physical activity throughout the school, teachers need professional development. Teacher training is important and related to the amount of physical activity students get in a classroom (Carlson et al., 2015). They need training on classroom management, connecting the learning to movement, selecting breaks their students will enjoy, and the support of the physical education teacher (McMullen et al., 2014).

Schools are more likely to implement higher levels of physical activity breaks when administrative support for movement is provided for teachers (Acosta et al., 2021; Densley et al., 2021). Supportive administration is likely to provide the financial resources for materials to help teachers provide physical activity (Acosta et al., 2021;

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Densley et al., 2021). Implementation of physical activity breaks is contingent on what teachers believe are the benefits and barriers of implementing it in the classroom (Dinkel et al., 2017), especially for low-resource schools that face a variety of other challenges (Hasson et al., 2023). Teachers who value physical activity have higher rates of students who participate in moderate-to-vigorous physical activity (Abi Nader et al., 2018; Acosta et al., 2021). Having a wellness champion, someone who is dedicated to wellness in the school building and helps train others, increases the amount of physical activity students receive (Densley et al., 2021). After implementing CPABs, teachers reported that “the students really enjoyed the CPABs (100%), that encouraging students to be physically active was either very important (83%) or important (17%), and that they were either very confident (72%) or confident (28%) that they themselves could lead the CPABs” (Mullins et al., 2019, p. 1). In Mullins et al., no teacher reported that the CPABs hindered classroom learning, as they appeared to be enjoyable to both students and teachers, easy to administer, and supportive of learning. A gap exists in the literature for professional development for classroom teachers regarding teaching them about the benefits of physical activity for students and how to implement it in the classroom.

### **Implementation of Physical Activity Programs**

If it is implemented with fidelity by classroom teachers, a structured in-class physical activity intervention program can reduce movement disparities among students based on gender, physical health conditions, and low-resource schools (Hasson et al., 2023). Having a plan to implement a physical activity program should include strategies that have guides, teacher training, classroom materials, classroom management

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procedures, and gamification ideas. Movement will improve classroom management, as students will be happier and more productive (Fiscal, 2021).

Figure 5 shows the barriers and the implementation strategies to overcome.

**Figure 5**

*Implementation Research Logic Model (Hasson et al., 2023)*

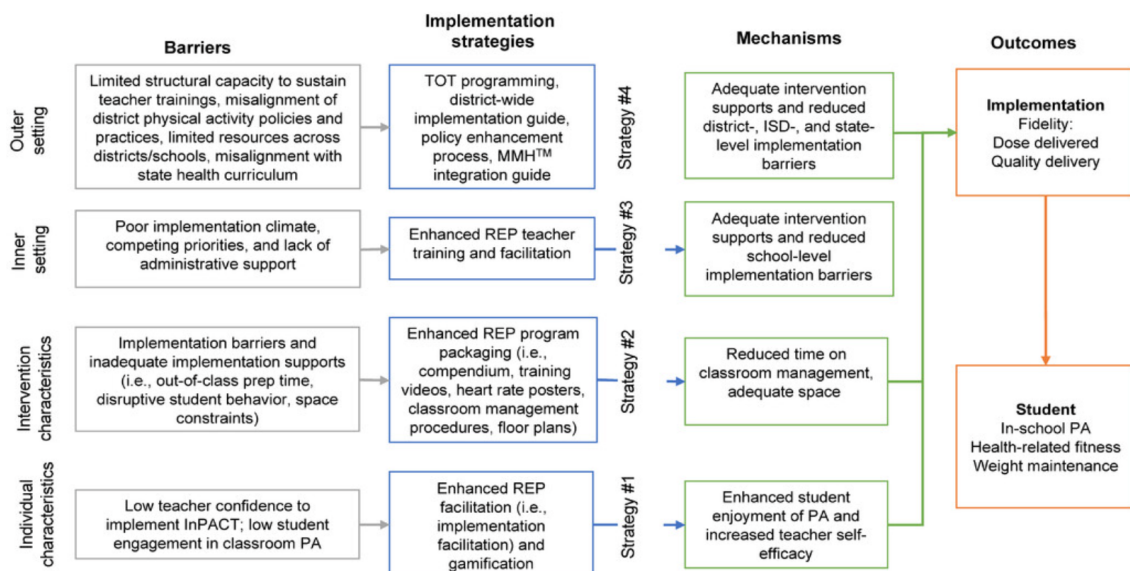


Figure 2

—Implementation research logic model for InPACT. Adapted from “The implementation research logic model: A method for planning, executing, reporting, and synthesizing implementation projects,” by J.D. Smith, D.H. Li, and M.R. Rafferty, 2020, *Implementation Science*, 15, p. 84. InPACT = Interrupting Prolonged sitting with ACTivity; TOT = training of trainer; REP = replicating effective programs; ISD = intermediate school district; PA = physical activity.

Citation: *Kinesiology Review* 12, 1; 10.1123/kr.2022-0041

These four strategies are used to overcome barriers to implementing the program. The figure above also provides the positives that can result from each one (Hasson et al., 2023).

### Are Educators Aware of the Benefits of Exercise for Students?

A gap in the literature has been found when looking at administrators and their knowledge of the benefits of physical activity for children. In school districts, the administration can make changes when it comes to the implementation of programs. With



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so many known benefits of physical activity for children, it is unknown if administrators are aware of these benefits. If there is awareness, what barriers are preventing administrators from requiring more physical activity to be taking place with elementary students?

### *Overcoming Barriers to Increase Physical Activity for Students with Special Needs*

The Education of All Handicapped Children Act of 1975 provided requirements for special education that include adaptive physical education (Horvat et al., 2019). Students with disabilities who cannot participate in the regular physical education class can have adaptive physical education with a specific plan unique to each child (Horvat et al., 2019). Students who receive adaptive physical education need to receive it from a certified adaptive physical education teacher (Kelly, 2019). Parental support is also very important to the physical literacy of children with disabilities (Columna et al., 2020), as they are vital to the planning of physical activity experiences outside of the school (Pushkarenko et al., 2021).

### **Summary**

A wide variety of benefits exist for students who get the recommended amounts of regular physical activity. Better academic performance, better physical and social-emotional health, and better focus and behavior at school are a result of regular physical activity (Kohl III & Cook, 2013). Children are recommended to have 60 minutes of daily moderate-to-vigorous physical activity (CDC, 2022); however, a very small percentage of students are meeting that recommendation (CDC, 2022; Lee et al., 2007; Packham & Street, 2019).

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Children spend the majority of their waking time at school, and the majority of that time is sedentary within a classroom (Norris et al., 2020). Barriers exist to providing regular physical activity to students that include poor classroom management, lack of space (McMullen et al., 2014), pressure on teachers to cover curriculum (Dinkel et al., 2017), lack of materials, disruptive student behavior (Hasson et al., 2023), lack of teacher professional development, and lack of time (Flippin et al., 2021). If physical activity is to increase for students at school, all of these challenges need to be taken into account when providing staff with the necessary professional development (Carlson et al., 2015).

This study explores why administrators are not ensuring students are receiving the recommended amount of daily physical activity by equipping teachers with the necessary resources. To better understand why this is not happening, administrators were surveyed, and the results are embedded in the study.

## **Chapter Three**

### **Methodology**

The purpose of this study was to use both quantitative and qualitative data to document the relationship between elementary school principals' understanding of the benefits of physical activity for their students and the amount of physical activity their students were getting daily. Much research has been done regarding the benefits of physical activity for students and how much they get daily. This study sought to contribute to the body of research regarding school principals' knowledge and their role in implementing the recommended amount of daily physical activity for students.

The methodology chapter explains the participants, instruments, procedures, data analysis, limitations and delimitations, assumptions, and research ethics used in this study. The study sought to look at the relationship between the amount of daily physical activity students receive at elementary schools and the elementary principals' understanding regarding the importance of physical activity for their students. The target population was elementary school principals from around the state of Ohio. The principals were sent an online survey consisting of demographic, knowledge, and implementation questions. The responses were transferred to the SPSS program for analysis. Results and implications for future research are discussed following this chapter.

### **Participants**

The population for the study consisted of elementary building principals from the sampling frame of the 611 Ohio public school districts (ODE, 2023). Within the Ohio Educational Department System (OEDS), there were 1,948 elementary principals, and

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902 of them listed an email address. Non-random, purposive sampling was utilized to select the targeted population of elementary school principals. All the elementary principals in Lake, Geauga, Cuyahoga, Ashtabula, Portage, Trumbull, Medina, Lorain, Stark, and Summit counties in northeast Ohio were contacted through their respective ESC. The exception was one elementary principal from northeast Ohio because of the researcher's employment within the district and the relationship to the elementary principal. The goal of the survey was to seek elementary principals' thoughts and beliefs on the importance of physical activity levels for their students. The Google Form (i.e., physical activity survey) was administered only to head elementary school principals. Middle school, high school, and assistant principals were not included in this sample. This way, each building was only represented once. The response rate was critical to the validity when using this survey design method.

### **Instrumentation**

There are a variety of survey research instruments that can be used: interviews, observations, and surveys. Interviews are conducted by the interviewer to seek verbal responses from the interviewee. Observations involve watching what people do and their behaviors. Surveys involve asking questions to the respondents in open-ended or recall-type questions that can include multiple choice responses (Columbia University, n.d.). A Google Form (see Appendix B) survey was utilized in this study and distributed to elementary principals across the state of Ohio to assess if students were getting enough physical activity and if principals were aware of the comprehensive benefits associated with physical activity. Elementary principals were the key variable to this study. The first question sought to gain demographic information to find out the free and reduced rate of

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the students in the school of the principal completing the survey. Response options must have equal intervals (Korb, n.d). Most of the questions were set up on a Likert scale with the option for five choices to measure the respondent's agreement with the statement. The first question on topic looked to measure how often the school achieved the recommended 60 minutes of daily physical activity for its students. The amount of physical activity taking place in the elementary school could be an indication of the individual principal's understanding of the importance of physical activity for students. Two of the questions measured the understanding of specific benefits associated with physical activity. One question assessed the barriers that principals see to physical activity for students during the school day.

The assessment used was self-created and based on the literature associated with the physical activity of students. The survey questions aligned with the research on physical activity of elementary-aged children while in school. It was important for the survey to be set up and designed to avoid user error (Korb, n.d.). The Google survey was set up so that the respondent must answer all the questions before the survey could be submitted to prevent responders from accidentally skipping questions. Also, the words "select all that apply" were put in bold to put extra emphasis that the participant could select more than one option.

A sample survey was sent out to 10 educators to get their feedback. There were two questions that were asked of the educators to complete. They were asked what they would word differently, as well as to identify the researcher's purpose of the study. The feedback was considered when revising the survey. For example, online school was

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added to a demographics question, and “I am unsure” was added for a principal who does not know approximately how much physical activity his or her students receive daily.

### **Procedure**

The data collection for the study took place using a self-created, web-based questionnaire. The data collection was approved by the Youngstown State University Institutional Review Board (see Appendix C). All Institutional Review Board policies and guidelines were followed. The instrument used in this study was administered to building principals electronically via email. These quantitative and qualitative methods allowed for a statistical analysis of the collected data. Electronic surveys provide some advantages in survey research. Time saving, convenience, accessibility, wide scope, accuracy, quick results, improved relationship with customers, and more flexibility are benefits of using a web survey (Melo, 2022, p. 2). The web-based format was used for increased efficiency in distribution and data collection. Disadvantages of using a web-based survey include the sampling, response rate, non-respondent characteristics, maintenance of confidentiality, and ethical issues (Nayak & Narayan, 2019). To account for possible low response rates from the elementary principals from the following counties: Lake, Geauga, Cuyahoga, Ashtabula, Portage, Trumbull, Medina, Lorain, Stark, and Summit, the sample size of the study was increased to include all elementary principals with an email address listed in OEDS. The survey questions were precise to aid in accuracy of the responses.

The survey was sent via email to 902 elementary principals at one time with a link to the Google survey. Once the email went out, participants could immediately complete the survey. A notification was set within the Google survey that the researcher would get

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an email notice that a survey was completed. The survey was closed 14 days later. If a principal attempted to complete the survey after it had closed, they received a message that the survey was closed. A follow-up email reminder was sent five days after the initial survey and again the day before the survey was closed to meet the goal of a 30% response rate. The email invitation to participate in the study introduced the researcher and requested the participant to click on the link if they gave consent to participate in the survey. The link redirected willing participants to a secure Google Survey. A consent form (see Appendix A) was again in the body of the email and found at the beginning of the survey. An “I agree” statement was in the body of the email to the elementary principal. By clicking on the survey, he or she was giving his or her consent to participate in the survey. The first question had an electronic consent question. By selecting “I agree,” the participant was consenting that “I am at least 18 years old, have read and understood this consent form, and I voluntarily agree to participate in this research study.” A link to the consent form followed the statement.

The first question collected the demographics of the student population of the principal’s school. The second question was topographical to gain a better understanding of the location of the school. The next five questions were related to the amount of physical activity students were getting at the principal’s elementary school and his or her beliefs on the subject matter. The total survey took an estimated 10 minutes to complete. The survey had directions for completion and requested that only head principals complete it. Google Docs were used to collect the data and the setting was selected not to collect emails and personal identifying information. Within the heading of the survey, the privacy practices were stated again to help with participants feeling comfortable about

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completing it. The heading stated, “The online survey will not be collecting your personal information such as your email address. Your answers will be stored within the Google suite. Nobody will be able to identify that you participated in this survey.”

### **Data Analysis**

Results from the data collection were tracked in a Google Sheet linked to the physical activity survey. The data was then transferred to the statistical analysis program SPSS. The association between categorical questions was tested through a series of chi-square tests. It is likely that one event will be the cause of another (Pearl, 2009). To do the research as accurately as possible, a variety of mechanisms must be in place to prove the cause-and-effect relationship (Bachman & Schutt, 2007). One mechanism that must be in place to claim a cause-and-effect relationship is the nomothetic perspective (Bachman & Schutt, 2007). It is a change in the independent variable that leads to a variation in the dependent variable (Bachman & Schutt, 2007). In this study, the independent variables of the principals’ understanding of the effects of regular exercise on students’ academics and mental health were tested to see if there was an association with the amount of physical activity children were getting at the school.

Causal effect is when a series of events result in a particular outcome (Bachman & Schutt, 2007, p. 462). There are often initial conditions that relate to a series of ongoing events that lead to the causal effect (Bachman & Schutt, 2007). Multiple chi-square analogies were completed for each categorical question. The chi-square test of independence answered if there was a difference or association between each category. A chi-square test was also completed to see if there was an association between schools that



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always meet their 60 minutes of physical activity and the number of barriers that exist at the school.

### **Limitations and Delimitations**

Reliability and validity are often used interchangeably because they have some similarities, but there are also some differences worth noting. According to Sullivan (2011), reliability is about an assessment tool giving the same results every time in a similar setting. Frisbie (2005) says reliability is about the score and not about the instrument; it is also not about the individual obtaining the scores. Validity refers to the strength of the conclusions drawn from the study and is not based on the tool, but on the interpretation or specific purpose of the assessment tool (Sullivan, 2011). Both validity and reliability are similar because they ultimately determine if a study is accurate. A study with good reliability and validity can be presumed to be very accurate (Sullivan, 2011). The opposite also holds true. If one or both parts are not reliable or do not demonstrate validity, the study is not as accurate.

A variety of limitations existed within this study. The elementary school principals surveyed were only from Ohio. Elementary principals from other states or countries were not asked to participate. Even though there were 1,743 elementary school principals listed on the OEDS public school state data system, only 902 listed an email address. Because of limited funds, email was the choice for collecting data versus sending mailers to their school addresses.

The boundaries or delimitations of this study were narrowed to focus on a few variables. The study was limited to elementary school principals. The study did not cover the beliefs of other administrators, teachers, legislatures, parents, or the students. If a

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school ensured students were getting 60 minutes of physical activity daily, this study did not include or ask how the school was meeting that goal.

### **Assumptions**

First, there was an assumption that elementary school principals who believed that the physical activity of students was important would be more likely to be meeting the goal of 60 minutes daily of physical activity. Second, there was an assumption that students from higher socioeconomic schools would be closer to the daily 60 minutes of physical activity. Schools from lower socioeconomic status areas have more students struggling academically (Le et al., 2019), and it was assumed that many of those schools have cut out activities that were not directly related to learning like physical activity. This would align with research that children from lower socioeconomic backgrounds demonstrate more sedentary behaviors (Tandon et al., 2021). There was also an assumption that most elementary principals would know that physical activity is good for their students' physical health but not the impact it has on their academics and social-emotional health.

### **Research Ethics**

A variety of measures were put in place to protect the rights, privacy, and well-being of all the elementary school principals who participated in the research. The research was designed to establish ethical guidelines and regulations as stated by the Youngstown State University IRB. Before starting the data collection process of this study, ethical approval was sought from the IRB committee, and the approval was given after reviewing the study's research design, methodology, informed consent process, and data security procedures.

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Before starting the data collection process, participants were provided with detailed information on a consent form about the research objectives, procedures, potential risks, and benefits, confidentiality measures, and their rights as participants in the study. Informed consent to participate in the study was the first question in the survey. They were informed that participation was voluntary. Participants were told they could withdraw from the study at any point without consequences.

The study was believed to have no known risks; however, as with any online activity, the risks related to confidentiality were always possible. To the best of the researcher's ability, the answers in this study were kept confidential through using the secure Google Form. The online survey did not collect personal information (e.g., emails or computer IP addresses). Participants' answers were sent to and stored within the Google Form. No one, including the researcher, knew which individual elementary principals participated in the study. Participants were provided with the contact information of the researcher if assistance was needed while participating in the study.

The researcher involved in this study stated that there was not a conflict of interest that could influence the research findings, data findings, and/or interpretation. Any school district that the researcher had a personal connection with was not sent a survey. Ethical considerations demonstrated the commitment of the researcher to uphold the highest standards of ethical guidelines outlined by the IRB committee. Making sure the welfare, rights, and privacy of the participants has been emphasized in this study. Every effort was made to ensure the research positively added to the advancement of education while respecting the rights of all the individuals involved.

### Summary

The purpose of this survey was to document the relationship between elementary school principals' understanding of the benefits of physical activity for their students and the amount of physical activity their students were getting daily. The study was quantitative and qualitative using a survey that was administered to elementary school principals through a Google Form. The study sought to document elementary principals' understanding of the importance of physical activity for his or her students, and the impact it has on the amount of physical activity they receive daily. Participants were elementary school principals from the state of Ohio. Assistant principals and other administrators were excluded from this study. Each participant completed the physical activity survey, and it included demographic questions to aid in the analysis of the data collected.

The threats to validity were addressed to minimize the impact on this study. Specific instructions were given to support the validity of responses. To control outside influences on the survey, it was not given to school officials who the researcher knew. The participants were also notified that their responses would be anonymous and confidential.

Assumptions were made regarding the beliefs that elementary principals would have about physical activity. Assumptions were made that they would believe physical activity was important to students' health, but they would not recognize its benefits to their academics and social-emotional health. The assumption that students from higher

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socioeconomic schools would have more daily physical activity than students from lower socioeconomic schools was analyzed (Tandon et al., 2021).

The study proposed to fill gaps in the research regarding elementary school principals' knowledge and beliefs on the importance of physical activity to their students' academic and social-emotional health. The results of this study contribute to understanding why students have varying amounts of physical activity from one elementary school to another. Understanding the data can help with implementing more physical activity practices within the elementary school for students to help with their academics along with their physical and social-emotional health.

## Chapter Four

### Results

This chapter presents the analyzed data from a mixed-methods case study on Ohio elementary school principals' beliefs regarding the value of physical activity during the school day. The findings are based on the research questions from Chapter One:

1. Can elementary school principals explain the academic benefits that physical activity provides their students?
  - a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?
2. Can elementary school principals explain what the mental health benefits of physical activity are for their students?
  - a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?
3. What are the barriers to providing at least 60 minutes daily of physical activity in elementary classrooms?

The researcher collected data in accordance with the conditions set forth by Youngstown State University's Institutional Review Board. A voluntary, online Google survey was delivered to 902 Ohio elementary school principals. The number decreased to 883, as 19 email addresses were incorrect. The respondents completed the *Physical*

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*Activity Survey* that asked demographic questions and questions regarding their knowledge of the physical activity benefits to students. The researcher collected and analyzed the data using an anonymous Google form.

This chapter includes a presentation of the analyzed data with the findings from the survey. The purpose of this chapter is to demonstrate how the collected data supports the categories. One qualitative question was added to have the elementary principals describe their beliefs on the greatest benefits to students when physical activity is provided during the school day.

### **Response Summary**

Of the 883 elementary principals in Ohio who were sent the survey, 123 responded for a response rate of 14%. The multiple-choice questions for the quantitative data had a 99% answer rate. The qualitative question that asked for a response to the question, “*What do you think the greatest benefits are to students that are provided with physical activity during the school day?*,” had 116 responses for a response rate of 94%. The responses were collected through a Google Forms Survey that collected responses anonymously.

### ***Summary of Findings – Part One***

Part One sought to examine the demographic factors that impact an elementary principal’s ability to explain the academic and mental health benefits provided to students from physical activity. Out of a possible 123 responses, the sample included  $n = 121$  for free and reduced,  $n = 120$  for the setting,  $n = 123$  for gender,  $n = 123$  for years in education and  $n = 123$  for years of experience as a principal. Tables 1-7 provide the descriptive data for Phase One.

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**Table 1***Descriptive Data - Percentage of Students with Free and Reduced Lunch*

Free and Reduced Lunch %	<i>n</i>	%
0-20%	32	25.8
21-40%	25	20.2
41-60%	30	24.2
61-80%	12	9.8
80-100%	22	18
Unsure	1	0.8

As indicated in Table 1, the responses were fairly balanced, showing that the respondents worked in schools with not much poverty to high poverty.

**Table 2***Descriptive Data - Location of Elementary Schools*

Setting	<i>n</i>	$\alpha$
Inner City	13	10.6
First Ring Suburb	18	14.6
Suburb	62	50.4
Rural	29	23.6

About half of the respondents were from schools in the suburbs, with the next largest group representing rural settings. Around a quarter of the respondents, when combined, were from schools that were first-ring suburbs or the inner city.



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**Table 3***Descriptive Data - Elementary Principals by Gender*

Gender Identity	<i>n</i>	%
Female	82	66.1
Male	41	33.1

As indicated in Table 3, those who identified as female responded to the survey more than those who identified as male. The national trend is that there are more female elementary school principals at 57%, compared to males at 43% (Elementary School Principal Demographics and Statistics, 2023).

**Table 4***Descriptive Data - Years in Education*

Year in Education	<i>n</i>	$\alpha$
6-10 Years	2	1.6
11-15 Years	24	19.4
16-20 Years	23	18.5
Over 21 Years	89	71.8

The majority of the respondents have been in education over 21 years. Less than 2% have been in education for less than 10 years. Nationwide, 49% of principals taught 10-19 years before becoming a principal (Schwartz & Riser-Kositsky, 2023). Therefore, the data aligns with the national average, as most of the respondents have been in education for over 21 years.

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**Table 5***Descriptive Data - Years as a Principal*

Years as a Principal	<i>n</i>	$\alpha$
0-5 Years	32	26
6-10 Years	31	25.2
11-15 Years	24	19.5
16-20 Years	21	17.1
Over 21 Years	15	12.2

Just over half of the respondents indicated they had been principals for 10 years or less.

**Table 6***Descriptive Data - 60 Minutes of Physical Activity During the School Day*

How Often Met (60 minutes)	<i>n</i>	$\alpha$
Never	7	5.7
Once a Week	39	31.7
A Few Times A Week	61	49.6
Every Day of the Week	14	11.4
Unsure	2	1.6

While the majority of students are getting some movement during a school week, 5.7% are never meeting the goal of 60 minutes of physical activity a day during school. There were 11.4% of respondents stating their students are meeting the 60 minutes a day of movement activities at his or her elementary school.

**Table 7**

*Qualitative Data - An Elementary Principal's Beliefs on the Greatest Benefits of Physical Activity to Their Students*

Greatest Benefits	<i>n</i>	$\alpha$
Physical Health	42	36.2
Academic Learning	33	28.4
Attention and Focus	49	42.2
Emotional and Mental Health	43	37
Behavior	20	17.2
Relationships and Socialization	18	15.5
Release Energy	10	9.1
Other	29	25

The data shows a variety of benefits beyond the two quantitative questions asked regarding the academic and mental health benefits of physical activity. Attention and focus were mentioned as the greatest benefits to physical activity. Other benefits mentioned included recharging, a whole child approach, motivation, attendance, better perception of school, break for teachers, healthy lifestyle, sleep, sense of well-being, movement outlet, help to eat regularly, release of beneficial hormones, less technology use, less time on social media, recenter the brain, and having a stronger immune system.

### ***Summary of Findings – Part Two***

Part Two sought to look at the correlation between demographic factors and the understanding that elementary school principals shared regarding the effects of physical activity on students' academics and mental health. Phase two also sought to look at the

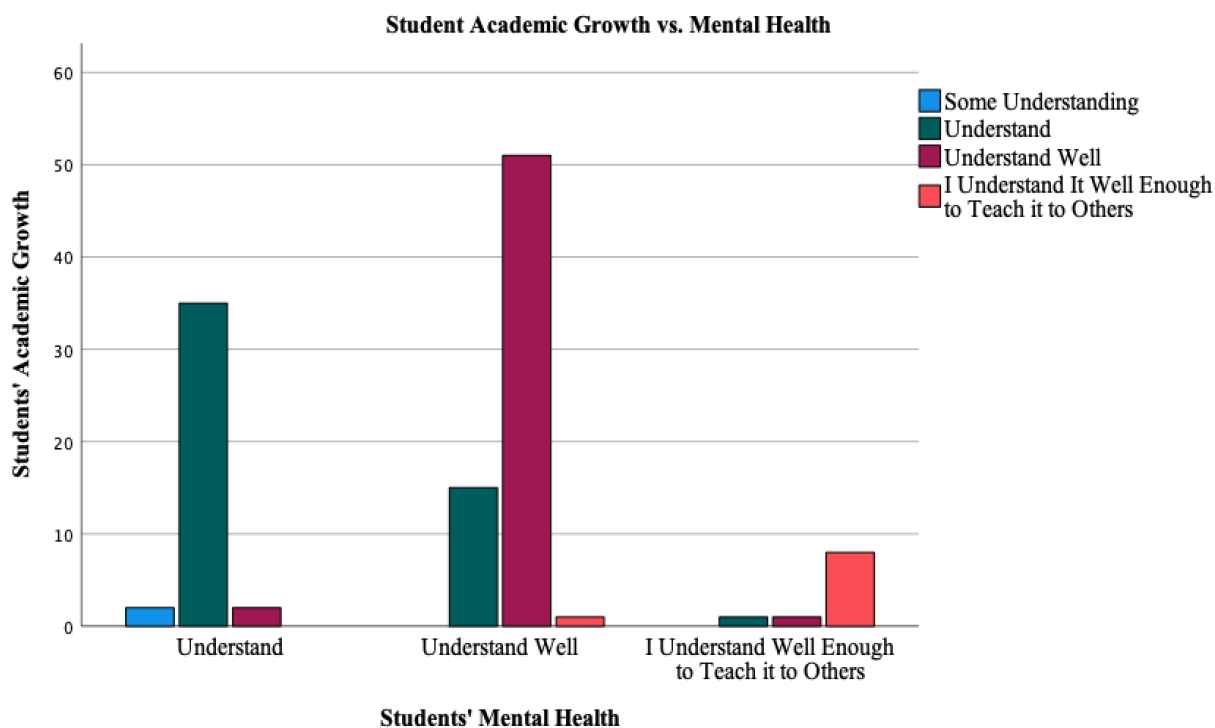
## LET THEM MOVE

correlation between demographic factors and the number of days a week a school is getting the recommended 60 minutes of daily physical activity.

The results of the Pearson chi-square analysis indicated a statistically significant association between the reported understanding of physical activity to students' academics and the reported understanding of physical activity to students' mental health,  $X^2(6) = 135.77, p < .001$ . A graphical image illustrating this association is provided in Figure 6. There is a greater understanding of the effects on mental health compared to academic growth.

**Figure 6**

*Chi-Square Analysis on the Elementary Principal's Understanding of the Effects of Physical Activity on Students' Academics and Mental Health*



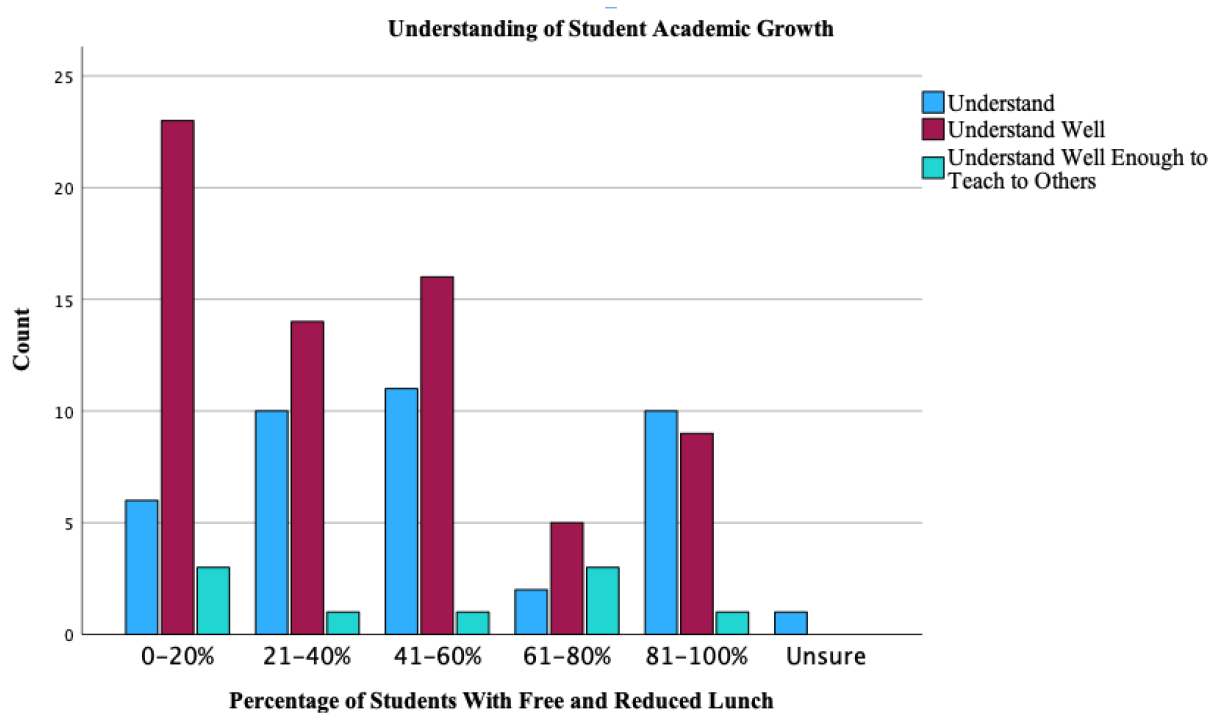
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The results of the Pearson chi-square analysis found in Figure 7 did not indicate a statistically significant association between free and reduced rate and the elementary principals' understanding on the effects of academics,  $X^2 (15) = 24.76, p = .053$ .

**Figure 7**

*Chi-Square Analysis of the Free and Reduced Rate of Students to Principal*

*Understanding Effects of Physical Activity on Academics*



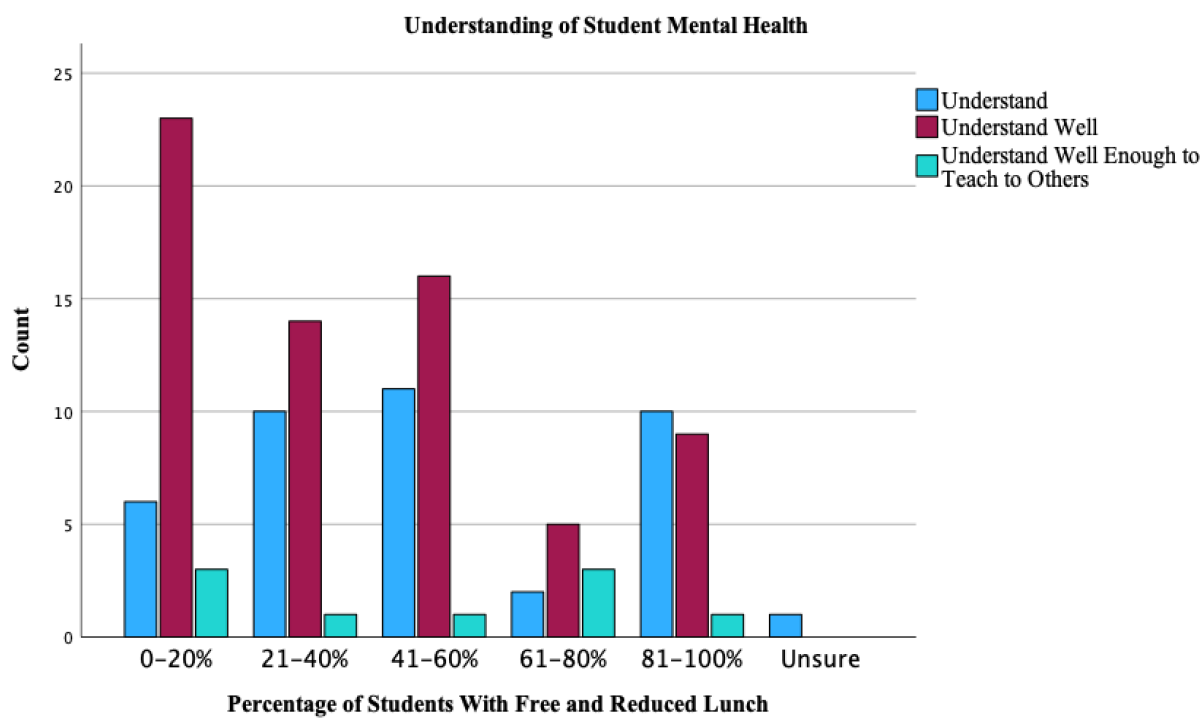
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The results of the Pearson chi-square analysis found in Figure 8 did not indicate a statistically significant association between free and reduced rate and the elementary principals' understanding on the effects on mental health,  $X^2(10) = 16.17, p = .095$ .

**Figure 8**

*Chi-Square Analysis of the Free and Reduced Rate of Students to Principal*

*Understanding Effects of Physical Activity on Mental Health*

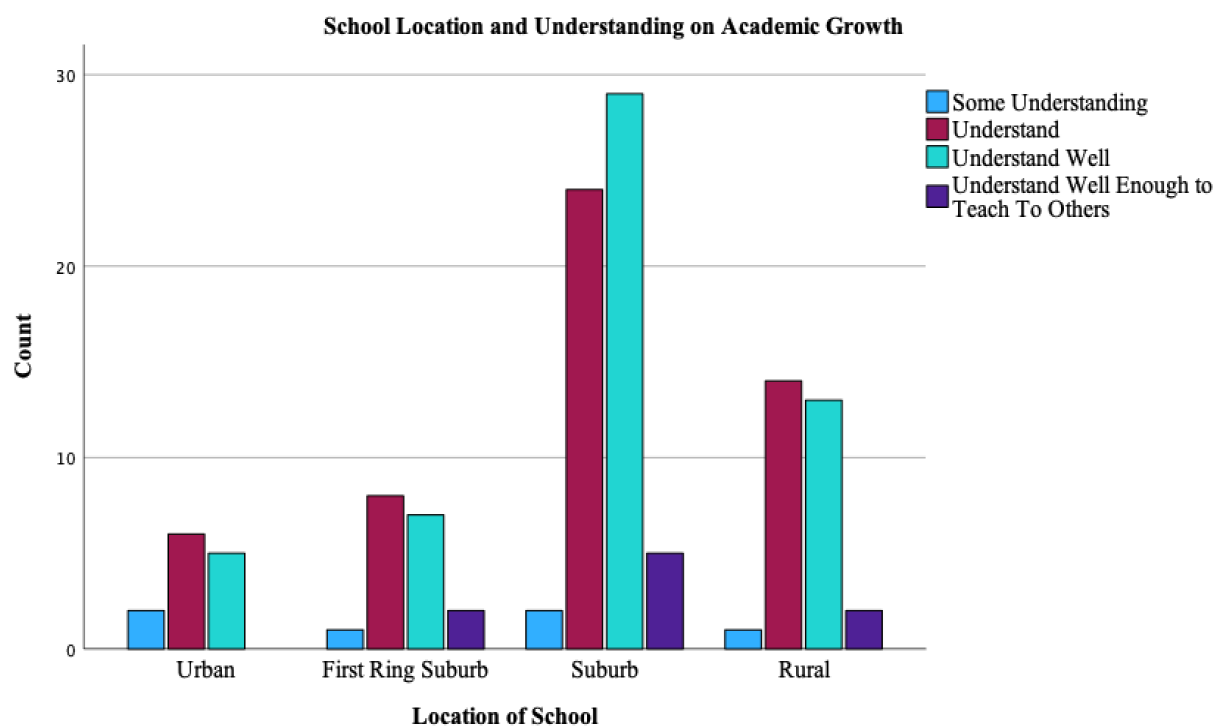


## LET THEM MOVE

The results of the Pearson chi-square analysis in Figure 9 did not indicate a statistically significant association between location and the elementary principals' understanding on the effects of academic growth,  $X^2 (9) = 5.42, p = .796$ .

**Figure 9**

*Chi-Square Analysis of the School Location to Principal Understanding Effects of Physical Activity on Academic Growth*

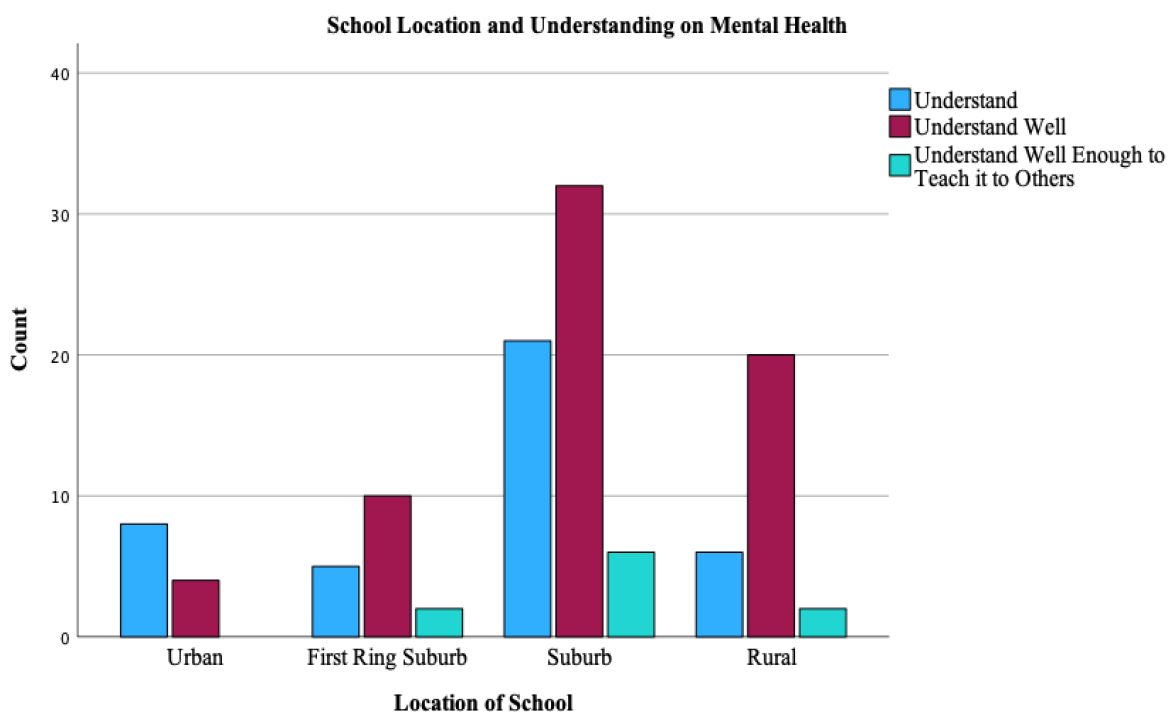


## LET THEM MOVE

The results of the Pearson chi-square analysis found in Figure 10 did not indicate a statistically significant association between location and the elementary principals' understanding on the effects of mental health,  $X^2(6) = 8.9, p = .18$ .

**Figure 10**

*Chi-Square Analysis of the School Location to Principal Understanding Effects of Physical Activity on Mental Health*



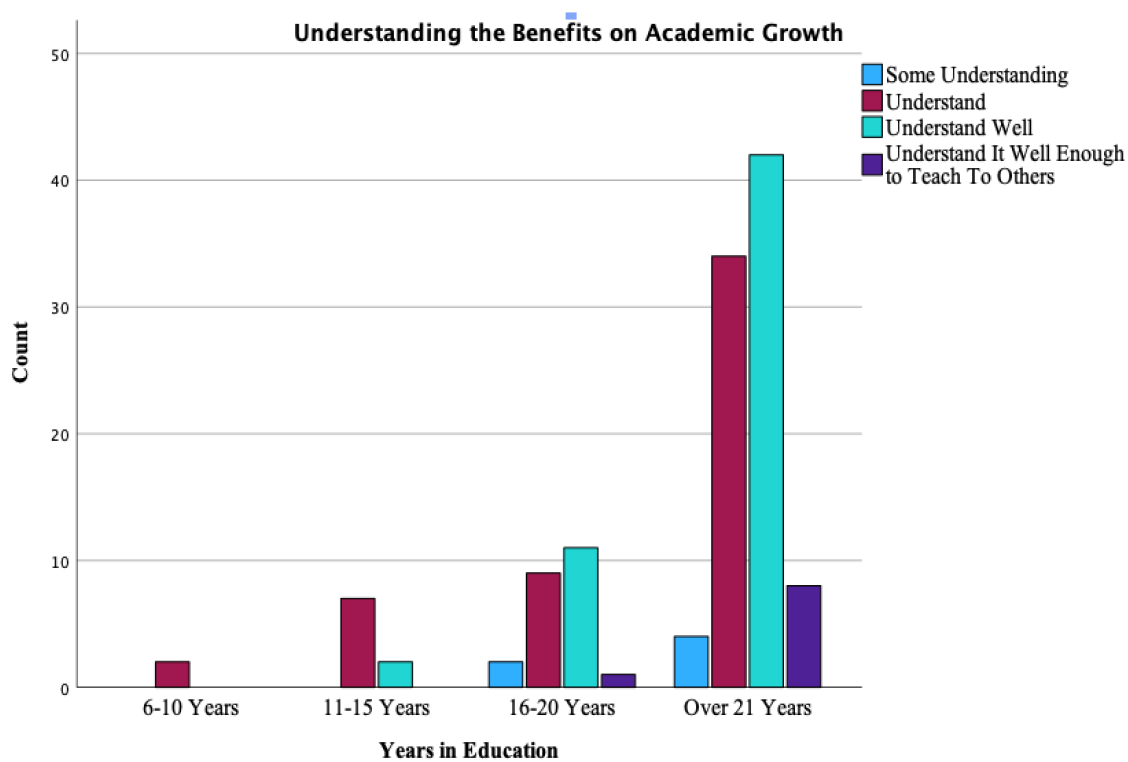


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The results of the Pearson chi-square analysis in Figure 11 did not indicate a statistically significant association between years experience in education on the effects of understanding academic benefits,  $X^2 (9) = 9.35, p = .406$ .

**Figure 11**

*Chi-Square Analysis of Years in Education and Understanding Effects of Physical Activity on Academic Growth*

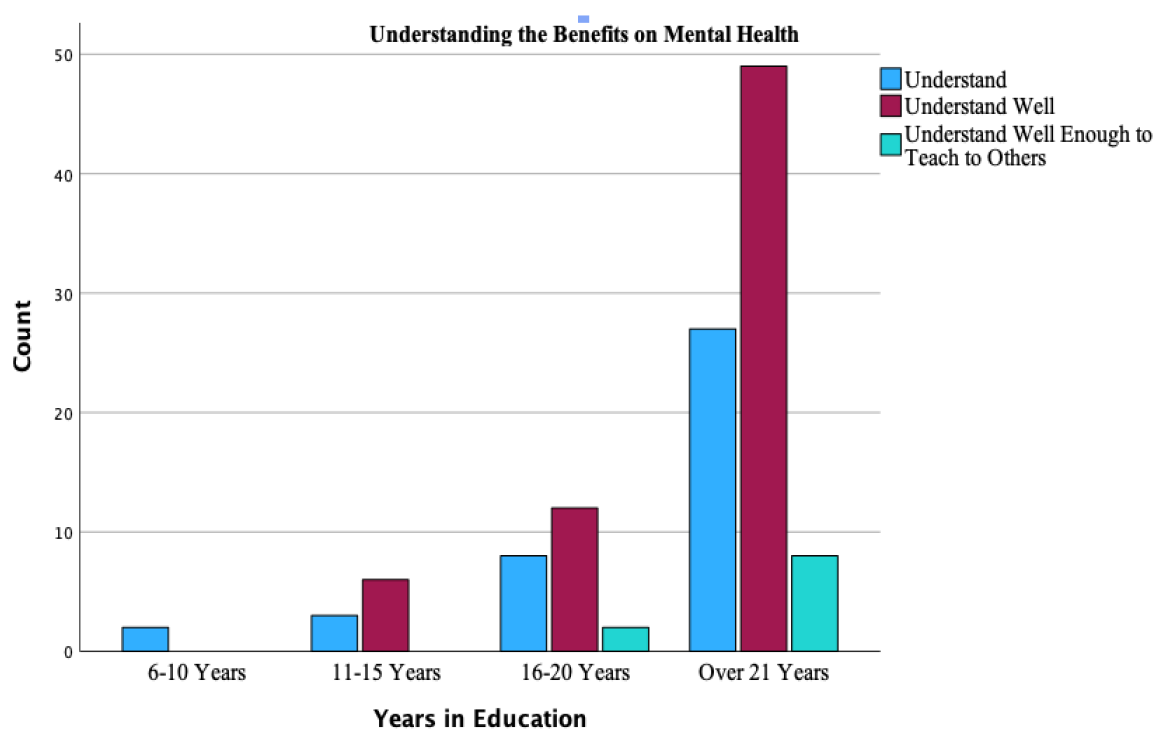


## LET THEM MOVE

The results of the Pearson chi-square analysis in Figure 12 did not indicate a statistically significant association between years of experience in education on the effects of understanding the mental health benefits,  $X^2 (6) = 5.04, p = .539$ .

**Figure 12**

*Chi-Square Analysis of Years in Education and Understanding Effects of Physical Activity on Mental Health*

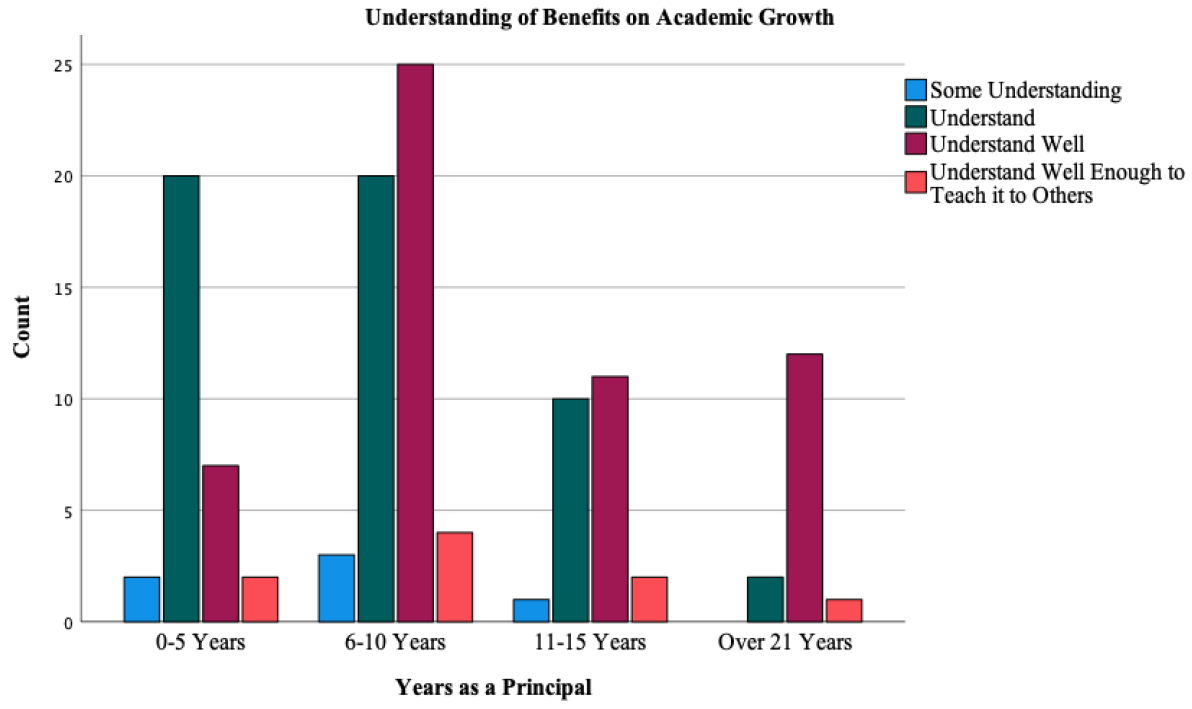


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The results of the Pearson chi-square analysis in Figure 13 did not indicate a statistically significant association between location and the elementary principals' understanding on the effects on academic growth,  $X^2 (9) = 15.44, p = .08$ .

**Figure 13**

*Chi-Square Analysis of Years of Experience as a Principal and Understanding Effects of Physical Activity on Academic Growth*

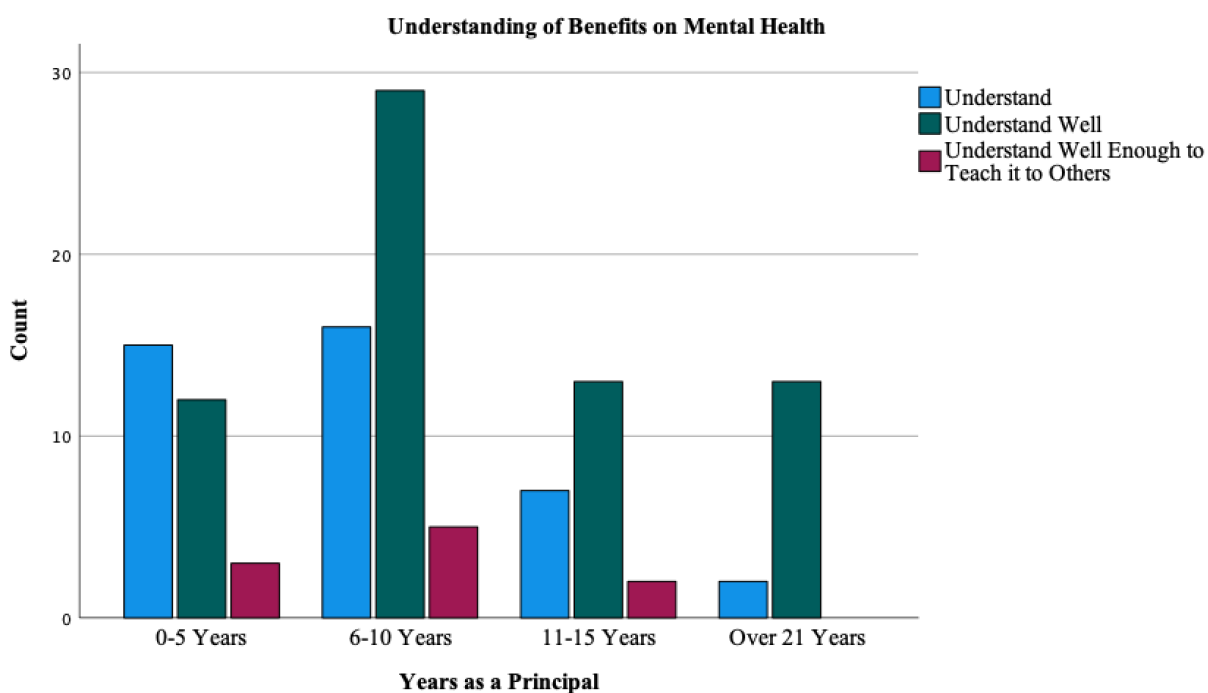


## LET THEM MOVE

The results of the Pearson chi-square analysis in Figure 14 did not indicate a statistically significant association between location and the elementary principals' understanding on the effects on mental health,  $X^2(6) = 9.54, p = .145$ .

**Figure 14**

*Chi-Square Analysis of Years of Experience as a Principal and Understanding Effects of Physical Activity on Mental Health*

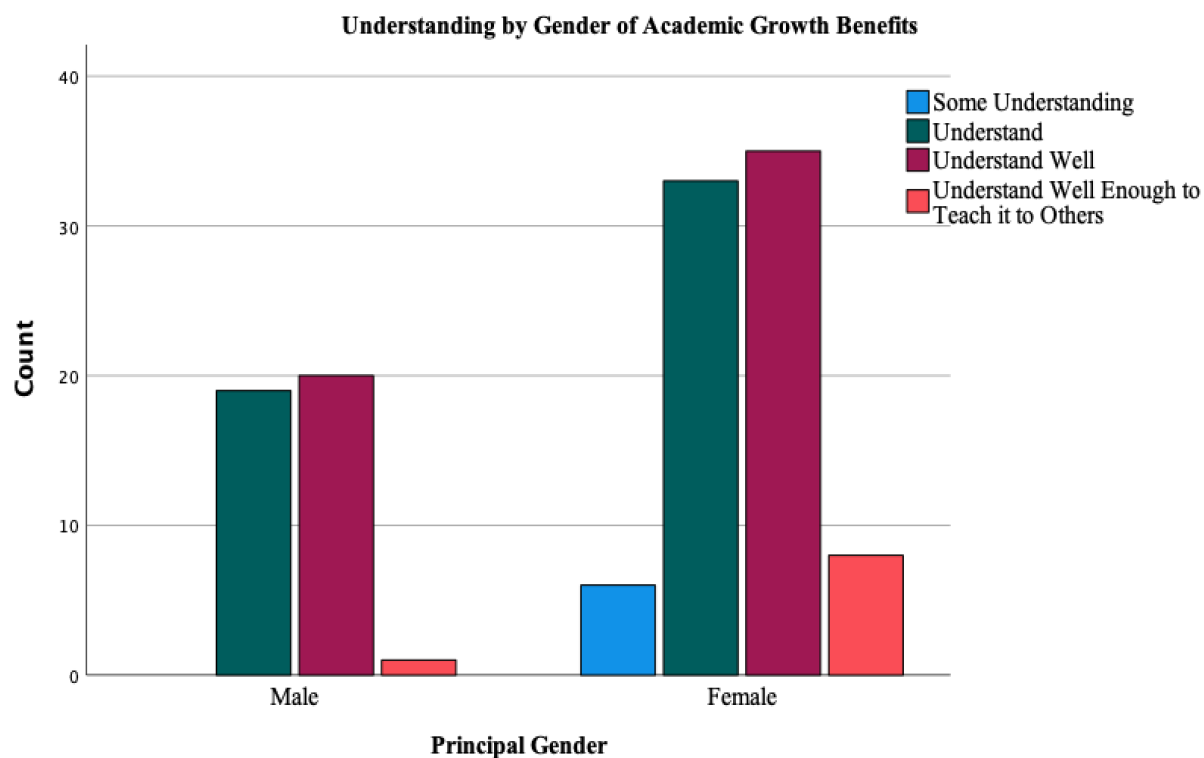


## LET THEM MOVE

The results of the Pearson chi-square analysis in Figure 15 did not indicate a statistically significant association between the gender and the elementary principals' understanding on the effects of physical activity on academics,  $X^2(3) = 5.5, p = .139$ .

**Figure 15**

*Chi-Square Analysis on the Gender of a Principal and Understanding Effects of Physical Activity on Academic Growth*

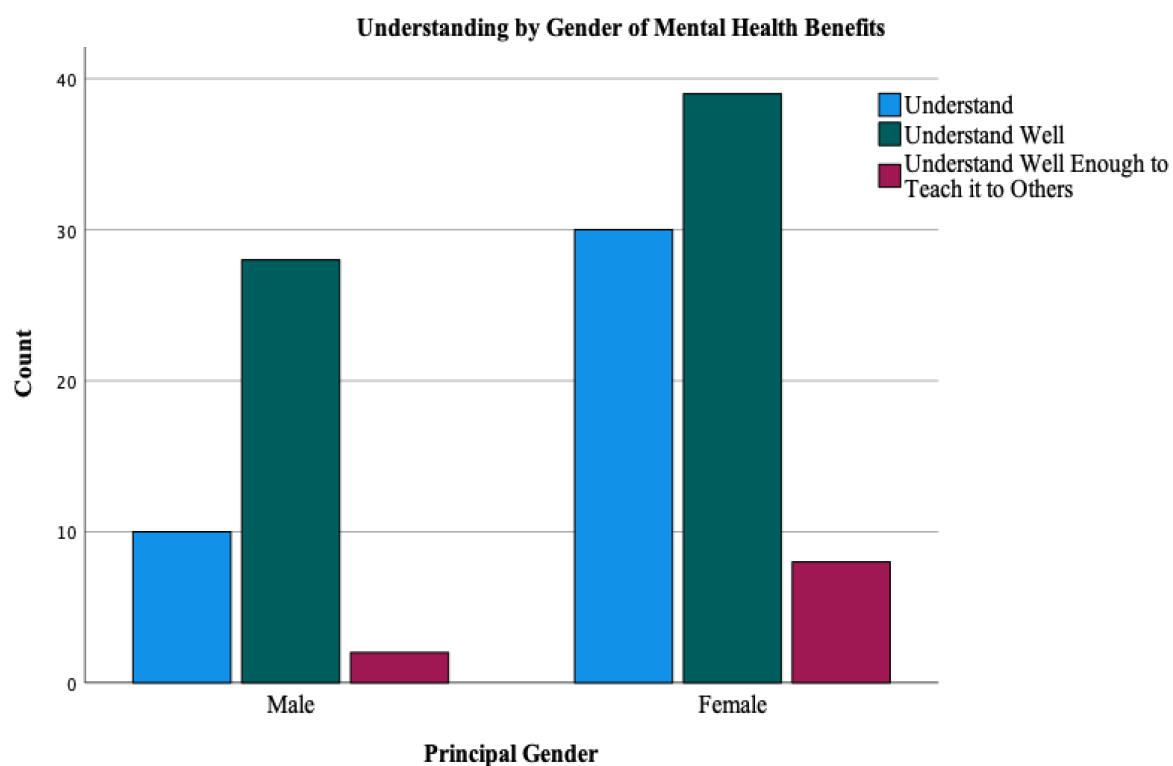


## LET THEM MOVE

The results of the Pearson chi-square analysis in Figure 16 did not indicate a statistically significant association between gender of elementary principal and his or hers understanding on the effects of mental health,  $X^2 (2) = 4.12, p = .128$ .

**Figure 16**

*Chi-Square Analysis on the Gender of a Principal and Understanding Effects of Physical Activity on Mental Health*



The correlation between a principals' understanding of regular physical activity on students' academic growth compared to how many days of the week the students get 60 minutes of daily physical activity was significantly significant at  $p = .004$ . The results of the Pearson chi-square analysis indicated a statistically significant association between the reported understanding of physical activity to students' academic growth and how often the students get the recommended 60 minutes of daily physical activity,  $X^2 (9) =$

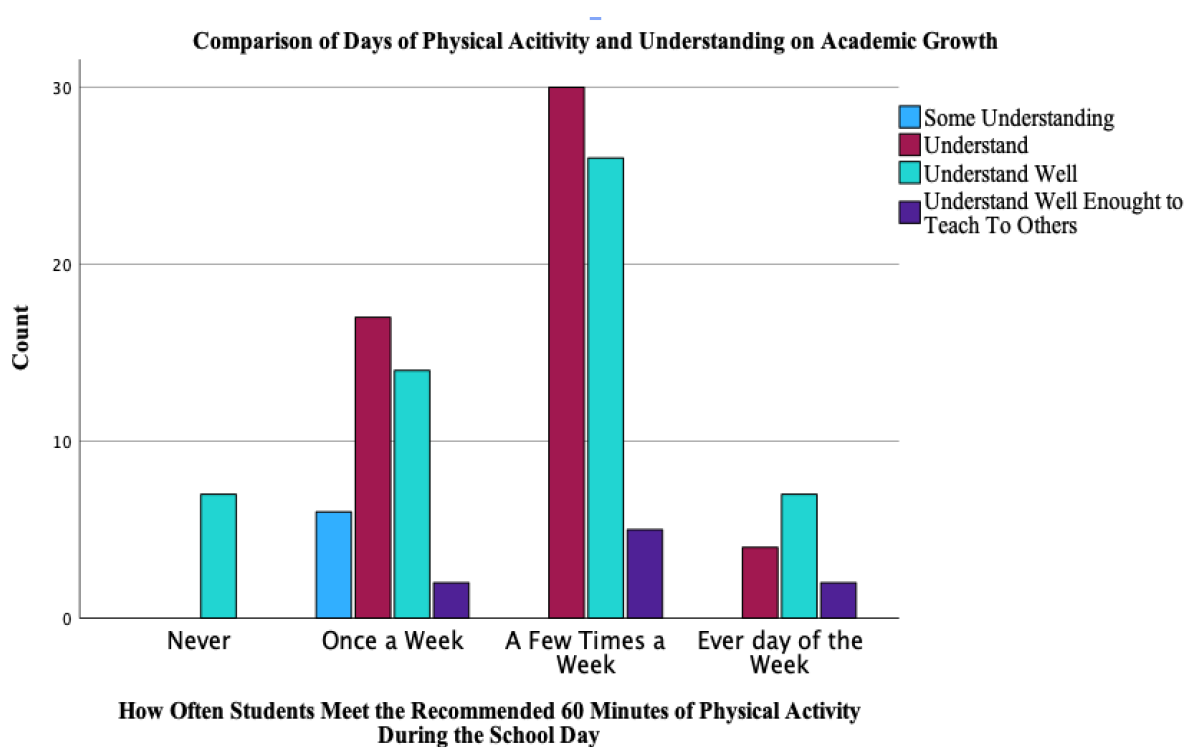
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24.17,  $p < .001$ . A graphical image illustrating this association is provided in Figure 17.

The better a principal understands the benefits of physical activity to academic growth, the more likely a student at his or her school is to receive 60 minutes of daily physical activity.

**Figure 17**

*Principals' Understanding of Regular Physical Activity on Students' Academic Growth Compared to How Many Days of the Week the Students Get 60 Minutes of Daily Physical Activity*



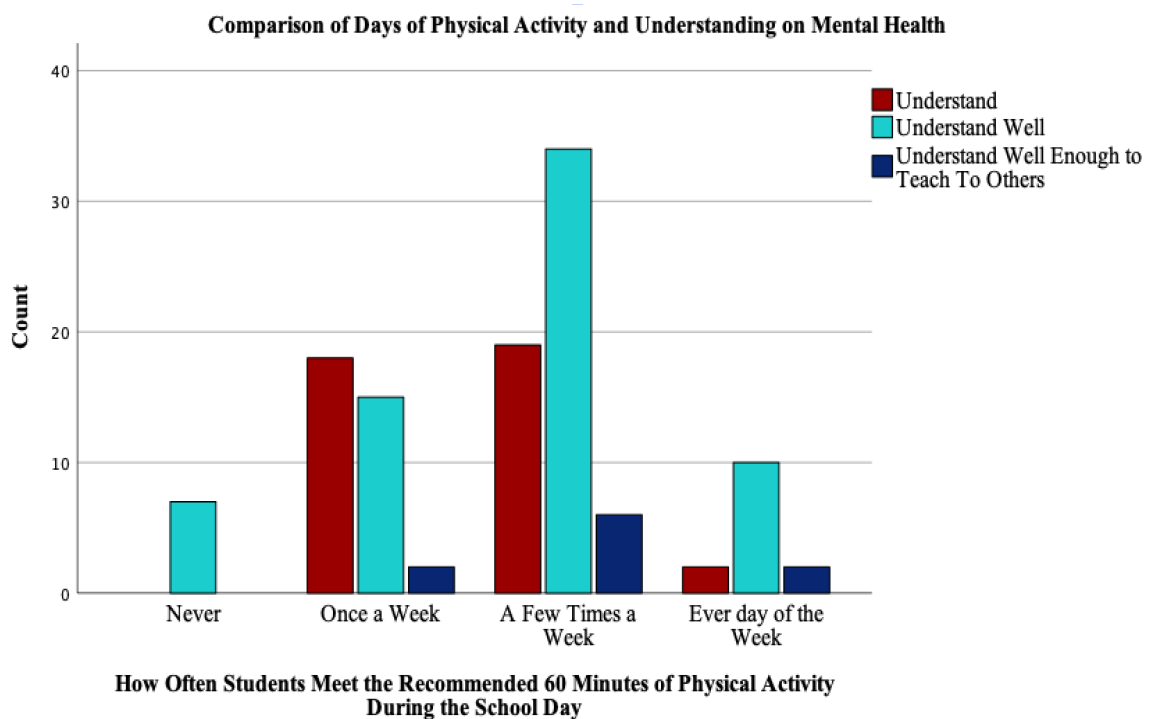
The correlation between a principals' understanding of regular physical activity on students' mental health compared to how many days of the week the students get 60 minutes of daily physical activity was significantly significant at  $p = .047$ . The results of the Pearson chi-square analysis indicated a statistically significant association between

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the reported understanding of physical activity to students' mental health and how often the students get the recommended 60 minutes of daily physical activity,  $X^2(6) = 12.782$ ,  $p < .001$ . A graphical image illustrating this association is provided in Figure 18. The better a principal understands the benefits of physical activity to mental health, the more likely a student at his or her school is to receive 60 minutes of daily physical activity.

**Figure 18**

*Principals' Understanding of Regular Physical Activity on Students' Mental Health Compared to How Many Days of the Week the Students Get 60 Minutes of Daily Physical Activity*





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*Summary of Findings – Part Three*

Part Three provides an analysis of the three research questions.

**Question One.** 1. Can elementary school principals explain the academic benefits that physical activity provides their students?

- a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?

**Table 8**

*Descriptive Data - An Elementary Principal's Understanding of Effects of Regular Physical Activity on Students' Academic Growth*

Understanding on Academics	<i>n</i>	<i>α</i>
No Understanding	1	0.8
Some Understanding	6	4.9
Understand	52	42.3
Understand Well	55	44.7
I Understand It Well Enough to Teach It	9	7.3

Approximately 94% of elementary principals indicated that they understand the effects of regular physical activity on their students' academics. The data was not significant for each of the demographic questions regarding location, free and reduced lunch rate, principal gender, years in education, and years as a principal.

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**Question Two.** Can elementary school principals explain what the mental health benefits of physical activity are for their students?

- a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?

**Table 9**

*Descriptive Data - An Elementary Principal's Understanding of Effects of Regular Physical Activity on Students' Mental Health*

Understanding on Mental Health	<i>n</i>	<i>α</i>
No Understanding	0	0
Some Understanding	4	3.3
Understand	40	33.1
Understand Well	67	55.4
I Understand It Well Enough to Teach It	10	8.3

Approximately 97% of respondents stated that they understand the effects of regular exercise on their students' mental health. This is 3% higher when compared to the principals' understanding of the effects on academics. Also, the principals' *understanding well* rating was 10% higher on mental health when compared to their *understanding well* of the effects on academics.

***Open Ended Feedback***

When analyzing and coding the 116 qualitative results for the question that asked principals, "*What do you think the greatest benefits are to students that are provided with*

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*physical activity during the school day?*,” a list of categories was created based on the anticipated responses. The original categories were:

- physical health
- academics/learning
- attention/focus
- social/emotional/mental health
- behavior
- other (i.e., category for outliers)

However, new responses from principals led to the creation of two new categories: *relationships and socialization* and *releasing energy*. Table 10 shows their responses.

**Table 10**

*Qualitative Data - New Category Responses*

Participant ID	Category	Response
60	Relationships/Socialization	“Exercise, collaboration, problem solving”
62	Relationships/Socialization	“Movement helps activate brain, helps with socioemotional development and peer relationships”
91	Relationships/Socialization	“Brain development, Coordination, Peer Interactions”
31	Relationships/Socialization	“Emotional health, physical health, socialization during structured/ unstructured play”
7	Relationships/Socialization	“Secondly, times of physical activity are oftentimes paired with opportunities for students to learn how to share and problem solve through play”
12	Relationships/Socialization	“A chance to recharge, move, and socially connect with other people.”

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104	Relationships/Socialization	“To build endurance, competition, diversity, and a sense of teamwork.”
14	Relationships/Socialization	“The positive impact on their mental health and physical health- and the practice of critical social skills are all equally important.”
74	Relationships/Socialization	“Improved health, learning how to get along with peers, develop collaborative behaviors.”
43	Relationships/Socialization	“There is also a huge SEL component with stress relief and making social interactions and connections with other students.”
44	Relationships/Socialization	“Physical Health and Wellness, Mental Health and Wellness, Social Interaction with Others.”
22	Relationships/Socialization	“Exercise, a mental break, and opportunities to interact/collaborate/cooperate with peers.”
80	Relationships/Socialization	“Students, at any age but especially in elementary school need activity during their school day to promote many aspects of their social, emotional and academic wellbeing.”
98	Relationships/Socialization	“Increased physical health benefits, increased mental health benefits, collaboration opportunities with others and team building.”
117	Relationships/Socialization	“Helps to relieve stress to improve academic focus and physical activity in schools is usually done in groups so students learn how to interact with each other appropriately through physical activity.”
100	Relationships/Socialization	“I think the greatest benefit is tied to the social-emotional regulation it helps provide students, particularly in a time when students are focused on gaming, social media and not necessarily outside playing as often as they used to.”
86	Relationships/Socialization	“Allows students to play and learn with others as well as get physical fitness to stay healthy.”
87	Relationships/Socialization	“Re-centering of the brain and play based interactions with peers.”

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110	Release Energy	“Outlet for energy as well as opportunity to connect body and mind (kinesthetic learning/connection).”
111	Release Energy	“Physical fitness and a way to release negative energy.”
73	Release Energy	“Physical activity is a great way to expend energy to help clear their mind and increases focus and concentration.”
79	Release Energy	“Time is needed to blow off some energy...important for good physical and mental wellbeing.”
82	Release Energy	“Release energy and activates certain parts of the brain and body to be ready to learn.”
96	Release Energy	“Movement is important for their bodies to expend energy and to help them focus on tasks.”
55	Release Energy	“Helps to release energy and focus during academic periods.”
118	Release Energy	“The benefits include: release of energy, increase dopamine, decrease of stress hormones, increased ability to focus, etc.”
29	Release Energy	“To get some energy out and get the body ready to listen and learn during the school day.”
121	Release Energy	“Gets their energy out.”

All of the responses were listed and then given a score of “one” each time it was in a principal’s response. Some of the responses did not fit a category, so they were listed in the “other” section. A few of the responses were close to a category, and discretion of the researcher placed them in the most appropriate category. For example, any time the word cognition or cognitive function came up, a score was recorded for “learning.” Stress was mentioned in responses and was coded for mental health unless further explained by the respondent. When the respondents mentioned a benefit was to “get the wiggles out” or “regulate the body,” they were coded under the benefit of “behavior” category. Table 7

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previously shared above shows the results of the greatest perceived benefits to elementary principals. The average is the number of times it was mentioned in 116 responses.

Respondents could list multiple benefits.

**Question Three.** What are the barriers to providing at least 60 minutes daily of physical activity in elementary classrooms?

**Table 11**

*Qualitative Data - The Challenges to Implementing More Physical Activity in Classrooms*

Challenges to Physical Activity (PA)	<i>n</i>	$\alpha$
Not Enough Time to Teach Curriculum	103	83.7
Not Enough Space or Resources	73	59.3
Not Enough Training and Professional Development	42	34.1
Do Not Know About the Benefits of Regular PA	15	12
Teacher's Negotiated Agreement (Union Contract)	41	33
No Challenges Exist	3	2.4
Other	12	9.8

The respondents were given six different choices to select as challenges to implementing more physical activity in classrooms. They could select all the choices that they thought applied. An "other" category was also given in which the respondent could write another barrier that was not listed.

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The most selected choice was “*not enough time to teach curriculum*” (83.7%) followed by “*not enough space or resources*” (59.3%), “*not enough training and professional development for staff*” (34.1%), “*teachers negotiated agreement or union contract*” (33.3%), “*do not know the benefits of regular physical activity*” (12.2%), “*other*” (9.8%), and three respondents stated that no challenges exist (2.4%).

The summarized answers that were given as “other” included:

- Central office not knowing the importance of physical activity and movement breaks.
- Not enough staff was mentioned twice.
- Not enough perceived value of physical movement to those outside of education.
- Staff not having a shared value and understanding for students to have physical activity.
- Would like to see two recess periods align with class brain breaks and hallway movement options.
- Time in the schedule was mentioned three times (required instructional minutes, shortened day due to bussing issues).

### Summary

Chapter Four examined how aware elementary school principals in Ohio are of the effects of physical activity on their students’ academic growth and mental health. While the data showed that the principals were aware of the benefits to both academics and mental health, they were more aware of the benefits towards mental health when compared to academics. Quantitative data looked at the demographics of the 123

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respondents and compared it to their responses on both their awareness of the benefits of physical activity to academic growth and mental health of students. The only results that were statistically significant were between the elementary principals' stated understanding of the effects of regular physical activity on academic growth compared to mental health at  $p = .001$ , as shown in Figure 6. There was a greater understanding of the positive effects on mental health compared to academic growth.

Data was also gathered on the perceived challenges of principals to attain 60 minutes of physical activity. Nearly 84% of the respondents said that the greatest challenge was not having enough time to teach the curriculum. The next most frequent responses were "*not enough space or resources*" and "*not enough training and professional development.*"

Qualitative data was collected from the Google survey and had 116 responses. The data was coded into seven different categories that included physical health, academic learning, attention/focus, emotional/mental health, behavior, relationships/socialization, and release energy. One category of "other" was created, and the most common repeated ideas for "other" were on improved attendance, releasing hormones, and a healthy lifestyle.

Lastly, data was compared using the principal's understanding on the benefits of physical activity to academic growth and mental health with their responses on how many days a week that their students receive 60 minutes of physical activity. Both results were significant and showed that the better a principal understands the benefits of physical activity to academic growth and mental health, the more likely a student at his or her school is to receive 60 minutes of daily physical activity.



## Chapter Five

### Discussion

The understanding that elementary school principals have on the benefits of physical activity for their students varies. This mixed-methods study was designed to look at the understanding that elementary school principals have on the benefits of physical activity toward mental health and academics. Additionally, demographic factors like gender, years in education, years as a principal, location of the school, and number of free and reduced students at the school were examined to determine if they had an influence on the amount of daily physical activity their students get while at school. The purpose of this research is to give educators an understanding of elementary school principals' knowledge on the benefits of physical activity and to examine how that correlates with their students meeting the recommended 60 minutes of daily physical activity (CDC, 2022).

The study was split into three phases of data collection and analysis. Phase One sought to examine the demographic factors that impact an elementary principal's ability to explain the academic and mental health benefits provided to students from physical activity. Phase Two sought to look at the correlation between demographic factors and the understanding that elementary school principals had on the effects of physical activity on students' academics and mental health. Phase Two also sought to look at the correlation between demographic factors and the number of days a week a school is getting the recommended 60 minutes of daily physical activity. Phase Three provided an analysis of the following three research questions:

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1. Can elementary school principals explain the academic benefits that physical activity provides their students?
  - a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?
2. Can elementary school principals explain what the mental health benefits of physical activity are for their students?
  - a. Is the data different based on the free and reduced lunch rate, gender of the principal, years in education of the principal, years experience as a principal, and the location of the elementary school?
3. What are the barriers to providing at least 60 minutes daily of physical activity in elementary classrooms?

While most elementary principals, across a variety of demographic backgrounds, were aware of numerous benefits of physical activity to their students, there was a significant difference between understanding and ensuring students were getting 60 minutes of daily physical activity in their buildings. A variety of barriers to implementation were stated by principals for a lack of implementation that included not enough time to teach the curriculum, not enough space or resources, not enough training and professional development, teachers do not know about the benefits of regular physical activity, teacher's negotiated agreement, staffing issues, and lack of knowledge and support from central office.

There was a significant difference between the elementary principals' stated understanding of the effects of regular physical activity on academic growth compared to

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mental health. There was a stronger awareness of the mental health benefits when compared to the awareness of the academic benefits.

Principals were able to list a variety of benefits provided by regular physical activity beyond mental health and academic growth. Improved attention and focus were mentioned as the greatest benefits of physical activity by the principals.

### **Interpretation of Findings**

When looking at the demographics of the school and elementary principal in relation to the amount of daily physical activity students received, there were no significant findings. In the area of free and reduced rate, school location, gender of the principal, years in education of the principal, and years experience as a principal, none of these factors made a significant difference in the amount of daily physical activity that students received at their schools. There is no other known research on this subject to challenge these findings.

Elementary principals had a slightly stronger understanding of the benefits of physical activity on mental health compared to benefits on academics. Also, the principals' *understanding well* rating was higher on mental health when compared to their *understanding well* rating on the effects on academics. No other studies on elementary principals' knowledge of their understanding are known that would support or contradict the findings in this study.

There was a significant difference between the elementary principals' stated understanding of the effects of regular physical activity on academic growth compared to mental health. There is a greater understanding by elementary principals on the effects of

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physical activity on mental health compared to academic growth. No known prior research could be found to support or contradict the results of this study.

The correlation between principals' understanding of regular physical activity on students' academic growth compared to how many days of the week the students get 60 minutes of daily physical activity was statistically significant. The better a principal understands the benefits of physical activity to academic growth, the more likely a student at his or her school is to receive 60 minutes of daily physical activity. No research from prior studies on this topic could be found to support or challenge the results of this study.

The correlation between principals' understanding of regular physical activity on students' mental health compared to how many days of the week the students get 60 minutes of daily physical activity was statistically significant. The better a principal understands the benefits of physical activity to mental health, the more likely a student at his or her school is to receive 60 minutes of daily physical activity. No prior studies on this topic could be found to support or contract the findings of this study.

Elementary principals were aware of the benefits of physical activity on their students' mental health and academics; they were also able to list a variety of other benefits to their students. The greatest benefit mentioned would be the improvement to students' attention. Other benefits mentioned included recharging, a whole child approach, motivation, attendance, better perception of school, break for teachers, healthy lifestyle, sleep, sense of well-being, movement outlet, help to eat regularly, release of beneficial hormones, less technology use, less time on social media, recenter the brain, and having a stronger immune system.

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When looking at the barriers to implementing 60 minutes of physical activity a day, elementary principals gave “*not enough time to teach curriculum*” as the biggest challenge to overcome. The next most impactful barriers, in order, were:

- *not enough space or resources*
- *not enough training and professional development*
- *do not know about the benefits of regular physical activity*
- *teacher’s negotiated agreement (union contract)*

The principals were also able to list “other” barriers. They came up with:

- *central office not knowing the importance of physical activity and movement breaks*
- *not enough staff*
- *not enough perceived value of physical movement to those outside of education*
- *staff not having a shared value and understanding for students to have physical activity*
- *would like to see two recess periods align with class brain breaks and hallway movement options*
- *time in the schedule (required instructional minutes, shortened day due to bussing issues)*

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### **Context of Findings**

While there is very little research exploring why students are not receiving 60 minutes of physical activity in the elementary school setting, this study is associated with the variety of research that exists to support the need and benefits for physical activity of children (Bull et al., 2020; Piercy et al., 2018). The Physical Activity Guidelines for Americans and the WHO recommend that children get 60 minutes or more of physical activity each day (U.S. Department of Health and Human Services, 2018; WHO, 2020). Despite the recommendations of 60 minutes of daily exercise from a variety of health experts, only 3.8% of elementary schools provide daily physical education (Lee et al., 2007).

Prior research has stated that students in elementary schools are struggling with a variety of issues and face many challenges to their learning. Around 10% to 50% of the time students are in a classroom, they are not able to focus (Godwin et al., 2016). John Hattie ranks ADHD as the most negative effect on student learning (Visible Learning, 2017). Anxiety and depression are the most common mental health issues experienced by children (Johnstone et al., 2018), and there was a 24% increase in child mental health issues following the pandemic (Leeb et al., 2020, para. 1). Additionally, the WHO believes that in the 21st century, childhood obesity is one of the most important global problems (Yuksel et al., 2020) and is considered to be at an epidemic level in the United States of America (Sanyaolu et al., 2019).

A variety of research exists that shows the benefits of physical activity to students. Following moderate to intensive exercise, students' behaviors improve, which allows students to spend more time on task (Daly-Smith et al., 2018; Masini et al., 2020;

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Pangrazi & Beighle, 2019; Sneck et al., 2019; Sun et al., 2022). Studies have shown that even small bursts of physical activity, or brain breaks, improve attention (Hasson et al., 2023; Terado, 2018), cognitive performance, and educational outcomes such as standardized test scores, reading literacy scores, and math fluency scores (CDC, 2014). Physical activity reduces off-task behavior (Bartholomew & Jowers, 2011), especially for the children who are the most off-task (Webster et al., 2015). Ninety-one percent of teachers feel that brain breaks help with students' concentration (Perera et al., 2015) and report fewer students who lack effort and motivation (Carlson et al., 2015). Taking a brain break, even before the last subject of the day, can improve student engagement between 17% and 40% (Tatum, 2019).

Physical activity affects the brain and supports learning by providing the brain with more oxygen, growing the hippocampus (Terado, 2018), and creating more volume in the prefrontal lobe and the medial temporal cortex, which controls thinking and memory (Pangrazi & Beighle, 2019). According to Bedard et al. (2019), acute exercise improves cognition through increased blood flow and neurochemical responses. Physical activity breaks improve academic and cognitive functions such as creativity, concentration, math competence, and ideational fluency (Dinkel et al. 2017; Tilp et al., 2020).

Integrating movement into classroom instruction and curriculum improves the learning for most students (Bedard et al., 2019). Physical activity breaks, with and without integrating math materials, were beneficial to improving on-task behavior and academic scores in children (Mavilidi et al., 2020; Sneck et al., 2019). Students who received aerobic-only movement breaks outgained students in reading achievement who

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had only academic breaks (Fedewa et al., 2018). Using programs like GoNoodle to promote physical activity during classroom breaks have been shown to positively affect students' reading fluency (Wold, 2019). Incorporating movement into the actual lessons is enjoyable to students and positively affects their learning (Bedard et al., 2019). Creative performance has improved in students who participate in aerobic games for 45 minutes (Tilp et al., 2020). Mora-Gonzalez et al. (2019) shared how an intervention of 70 minutes of moderate to vigorous physical activity resulted in improved working memory of children. Physically-active children outperform physically-inactive children academically (Castelli et al., 2007; Trudeau & Shephard, 2008) and show a better working memory than lower-fit children (Mora-Gonzalez et al., 2019). The academic benefits from physical activity outweigh the benefits of increasing learning time in subjects like reading and math (Fiscal, 2021).

Research by Waters et al. (2003) found that the principal of a school can have a positive impact on student achievement and making changes within the building. Principals can make substantial positive changes by influencing the beliefs, attitudes, and conditions in schools (Waters et al., 2003). There was a significant effect size of  $p = .42$  for principals who establish goals and expectations (Waters et al., 2003). The research supports the idea that principals can have a meaningful influence on ensuring students are getting the required amount of daily physical activity by making it a priority in their schools.

### **Implications of Findings**

The implications of the findings from this study can have a significant impact on how higher education prepares principals and how school districts and lawmakers go



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about addressing many of the challenges that students are facing. Prior research supports that principals can have a positive influence on what takes place in their buildings (Waters et al., 2003). This study found that the better a principal understands the benefits of physical activity to mental health and improving academics, the more likely a student at his or her school is to receive 60 minutes of daily physical activity. However, elementary principals were not as aware of the benefits of physical activity on academics when compared to the benefits of mental health. Also, the principals' *understanding well* rating was 10% higher on mental health when compared to their rating of *understanding well* on the effects on academics.

A few steps need to be taken to remove or reduce the barriers to the implementation of daily physical activity at school. This study found that teachers need to be provided with the training, education, resources, and administrative support to provide more daily physical activity for their students. Also, the results of this study show the importance of better educating elementary principals on the benefits of physical activity to their students, as this will likely increase the amount of physical activity that their students receive. Removing barriers will better allow students to garner the benefits of regular physical activity.

The data supports the need for school decision makers and lawmakers to look at requiring more daily physical activity for students. This study found that only 11% of elementary students are getting the recommended 60 minutes of daily physical activity. Elementary principals listed improving ADHD as the number one benefit of providing physical activity to students during the school day. This study shows that elementary

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principals are aware of the benefits to help students facing one of the most negative factors affecting their learning (Visible Learning, 2017).

### **Limitations of Study**

This study was designed to examine how much daily physical activity elementary students are getting while looking at a variety of factors that could influence that amount. While the research provided input from elementary school principals from Ohio, it did not gather feedback from other administrators, teachers, students, parents, or other stakeholders. It also did not gather data from elementary principals in other states or countries that may have different curricular and physical activity requirements. The study results came from 82 (67%) female and 41 (33%) male elementary school principals, so the results were based more on one gender. Lastly, the study did not gather further information from principals of schools that were meeting the 60 minutes of daily physical activity. Information pertaining to their schedules, teacher training, resources, and the benefits they have seen in their students was not included.

### **Future Research**

The current study looked to gather data on how much daily physical activity students were getting in elementary school, the understanding that principals had on the importance of daily physical activity, and it examined barriers to providing the recommended daily 60 minutes of physical activity. Exciting opportunities exist for future research to expand upon this study.

To expand this study, elementary principals from other states or countries could be interviewed. The researcher could examine if laws or policies in other locations around the world require more physical activity to take place in elementary classrooms.

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These structures could be examined to see if they could be adopted and implemented in Ohio.

Research on the academic benefits could be examined in correlation to the amount of daily physical activity that schools provide to their students. Based on the structures in place allowing regular physical activity, a researcher could examine to the relationship of academic achievement on standardized tests compared to schools with limited daily physical activity to their students.

Future research could further explore and follow up with the elementary schools that are providing 60 minutes of daily physical activity to their students. These principals likely have valuable information on how they implemented this in their buildings. Information on teacher training, resources, and structure of the day would be valuable for others to emulate. Also, further data could be gathered on these schools to look at the benefits to their students. For example, do these students have less anxiety, depression, obesity, or focus issues while doing better academically? By expanding this study, valuable data and information could be gathered to better support the whole child at elementary schools.

### **Conclusion**

This mixed-methods survey in this study revealed that elementary principals' knowledge on the importance of daily physical activity is connected to the amount of activity that their students receive. Principals were more aware of the benefits to the mental health of their students when compared to the academic benefits. However, the demographics of the school and the demographics of the principal did not have a significant effect on the amount of daily physical activity students received. The better

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educated an elementary school principal is on the benefits of daily physical activity, the more likely his or her students are to receive the recommended 60 minutes of daily physical activity in their school building.

### References

- Abi Nader, P., Hilberg, E., Schuna, J. M., John, D. H., & Gunter, K. B. (2018). Teacher-level factors, classroom physical activity opportunities, and children's physical activity levels. *Journal of Physical Activity and Health, 15*(9), 637-643.
- Acosta, M. E., Matsuzaki, M., Slater, S. J., & Sanchez-Vaznaugh, E. V. (2021). Physical activity strategies in low-resource elementary schools: Why and how are they prioritized? *Preventive Medicine Reports, 23*, 101430.
- Ahamed, Y., MacDonald, H., Reed, K., Naylor, P. J., Liu-Ambrose, T., & McKay, H. (2007). School-based physical activity does not compromise children's academic performance. *Medicine and Science in Sports and Exercise, 39*(2), 371-376.
- Andermo, S., Hallgren, M., Nguyen, T. T. D., Jonsson, S., Petersen, S., Friberg, M., Romqvist, A., Stubbs, B., & Elinder, L. S. (2020). School-related physical activity interventions and mental health among children: a systematic review and meta-analysis. *Sports Medicine-Open, 6*(1), 1-27.
- Anderson, E., & Durstine, J. L. (2019). Physical activity, exercise, and chronic diseases: A brief review. *Sports Medicine and Health Science, 1*(1), 3-10.
- Aubert, S., Barnes, J. D., Abdeta, C., Abi Nader, P., Adeniyi, A. F., Aguilar-Farias, N., Andrade-Tenesaca, D. A., Bhawra, J., Brazo-Sayavera, J., Cardon, G., Chang,

## LET THEM MOVE

- C.K., Delisle-Nystrom, C., Demetriou, Y., Draper, C., Edwards, L., Emeljanovas, A., Gaba, A., Galaviz, K., Gonzalez, S.,...& Tremblay, M. S. (2018). Global matrix 3.0 physical activity report card grades for children and youth: Results and analysis from 49 countries. *Journal of Physical Activity and Health, 15*(s2), S251-S273.
- Bachman, R., & Schutt, R. K. (2007). *The practice of research in criminology and criminal justice* (3rd ed.). SAGE Publication.
- Bailey, D. H., Duncan, G. J., Murnane, R. J., & Au Yeung, N. (2021). Achievement gaps in the wake of COVID-19. *Educational Researcher, 50*(5), 266-275.
- Bedard, C., St John, L., Bremer, E., Graham, J. D., & Cairney, J. (2019). A systematic review and meta-analysis on the effects of physically active classrooms on educational and enjoyment outcomes in school age children. *PloS One, 14*(6), e0218633.
- Bartholomew, J. B., & Jowers, E. M. (2011). Physically active academic lessons in elementary children. *Preventive Medicine, 52*, 51–54. <https://doi.org/10.1016/j.ypmed.2011.01.017>
- Basheti, I. A., Assaraira, T. Y., Obeidat, N. M., Al-Abed Al-Haq, F., & Refai, M. (2023). Assessing anxiety and depression among students post-covid-19: Exploring associating factors. *Psychology Research and Behavior Management, 16*, 1797–1810. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10187645/>
- Belcher, B. R., Zink, J., Azad, A., Campbell, C. E., Chakravartti, S. P., & Herting, M. M. (2021). The roles of physical activity, exercise, and fitness in promoting resilience

## LET THEM MOVE

during adolescence: effects on mental well-being and brain development.

*Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 6(2), 225-237.

Beemer, L. R., Ajibewa, T. A., O'Sullivan, M. P., Nagy, M. R., Ransier, B., Vance, U., Stockdill, D., Colabianchi, N., & Hasson, R. E. (2018). Feasibility of the InPACT intervention to enhance movement and learning in the classroom. *Translational Journal of the American College of Sports Medicine*, 3(18), 136-151.

Biddle, S. J., & Asare, M. (2011). Physical activity and mental health in children and adolescents: A review of reviews. *British Journal of Sports Medicine*, 45(11), 886-895.

Brener, N.D., Demissie, Z., McManus, T., Shanklin, S.L., Queen, B., & Kann, L. (2017). *School health profiles 2016: Characteristics of health programs among secondary schools*. Centers for Disease Control and Prevention. [https://www.cdc.gov/healthyyouth/data/profiles/pdf/2016/2016\\_Profiles\\_Report.pdf](https://www.cdc.gov/healthyyouth/data/profiles/pdf/2016/2016_Profiles_Report.pdf)

Brown, T., Moore, T. H., Hooper, L., Gao, Y., Zayegh, A., Ijaz, S Elwenspoek, M., Foxen, S., Magee, L., O'Malley, C, Waters, E., & Summerbell, C. D. (2019). Interventions for preventing obesity in children. *Cochrane Database of Systematic Reviews*, (7).

Bull, F. C., Al-Ansari, S. S., Biddle, S., Borodulin, K., Buman, M. P., Cardon, G., Carty, C., Chaput, J.P., Chastin, S., Chou, R., Dempsey, P., DiPietro, L., Ekelun, U., Firth, J., Friedenreich, C., Garcia, L., Gichu, M., Jago, R., Katzmarzyk, C., Lambert, E., Leitzmann, M., ...& Willumsen, J. F. (2020). World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*, 54(24), 1451-1462.

## LET THEM MOVE

- Caldwell, H. A., Di Cristofaro, N. A., Cairney, J., Bray, S. R., MacDonald, M. J., & Timmons, B. W. (2020). Physical literacy, physical activity, and health indicators in school-age children. *International Journal of Environmental Research and Public Health*, *17*(15), 5367.
- Calvert, H. G., Mahar, M. T., Flay, B., & Turner, L. (2018). Classroom-based physical activity: Minimizing disparities in school-day physical activity among elementary school students. *Journal of Physical Activity and Health*, *15*(3), 161-168.
- Carlson, J. A., Engelberg, J. K., Cain, K. L., Conway, T. L., Geremia, C., Bonilla, E., Kerner, J., & Sallis, J. F. (2017). Contextual factors related to implementation of classroom physical activity breaks. *Translational Behavioral Medicine*, *7*(3), 581-592.
- Carlson, J. A., Engelberg, J. K., Cain, K. L., Conway, T. L., Mignano, A. M., Bonilla, E. A., Geremia, C., & Sallis, J. F. (2015). Implementing classroom physical activity breaks: Associations with student physical activity and classroom behavior. *Preventive Medicine*, *81*, 67-72.
- Castelli, D. M., Hillman, C. H., Buck, S. M., & Erwin, H. E. (2007). Physical fitness and academic achievement in third-and fifth-grade students. *Journal of Sport and Exercise Psychology*, *29*(2), 239-252.
- Columbia University. (n.d.). *Research instrument examples*. Teachers College.  
[https://www.tc.columbia.edu/media/administration/institutional-review-board-/guide-amp-resources---documents/Published\\_Study-Material-Examples.pdf](https://www.tc.columbia.edu/media/administration/institutional-review-board-/guide-amp-resources---documents/Published_Study-Material-Examples.pdf)
- Carrasco-Uribarren, A., Ortega-Martínez, A., Amor-Barbosa, M., Cadellans-Arróniz, A., Cabanillas-Barea, S., & Bagur-Calafat, M. C. (2023). Improvement of in-school

## LET THEM MOVE

physical activity with active school-based interventions to interrupt prolonged sitting: A systematic review and meta-analysis. *International Journal of Environmental Research and Public Health*, 20(2), 1636. <https://www.mdpi.com/1660-4601/20/2/1636>

Centers for Disease Control and Prevention (2014). *Health and academic achievement*. [https://www.cdc.gov/healthyyouth/health\\_and\\_academics/pdf/health-academic-achievement.pdf](https://www.cdc.gov/healthyyouth/health_and_academics/pdf/health-academic-achievement.pdf)

Centers for Disease Control and Prevention. (2018). *Strategies for classroom physical activity in schools*. U.S. Department of Health and Human Services. [https://www.cdc.gov/healthyschools/physicalactivity/pdf/classroompastrategies\\_508.pdf](https://www.cdc.gov/healthyschools/physicalactivity/pdf/classroompastrategies_508.pdf)

Centers for Disease Control and Prevention. (2019). *Increasing physical education and physical activity: A framework for schools 2019*. [https://www.cdc.gov/healthyschools/physicalactivity/pdf/2019\\_04\\_25\\_PE-PA-Framework\\_508tagged.pdf](https://www.cdc.gov/healthyschools/physicalactivity/pdf/2019_04_25_PE-PA-Framework_508tagged.pdf)

Centers for Disease Control and Prevention. (2021, January 12). *Physical activity and sedentary behaviors and academic grades*. [https://www.cdc.gov/healthyschools/health\\_and\\_academics/physical-activity-and-sedentary-behaviors-and-academic-grades.htm](https://www.cdc.gov/healthyschools/health_and_academics/physical-activity-and-sedentary-behaviors-and-academic-grades.htm)

Centers for Disease Control and Prevention. (2022, July 26). *Physical activity facts*. Centers for Disease Control and Prevention. <https://www.cdc.gov/healthyschools/physicalactivity/facts.htm#:~:text=Regular%20physical%20activity%20can%20help,developing%20health%20conditions%20such%20as%3A&text=Heart%20disease>



## LET THEM MOVE

- Chaput, J.-P., Willumsen, J., Bull, F., Chou, R., Ekelund, U., Firth, J., Jago, R., Ortega, F. B., & Katzmarzyk, P. T. (2020, November 26). 2020 WHO guidelines on physical activity and sedentary behavior for children and adolescents aged 5–17 years: Summary of the evidence. *International Journal of Behavioral Nutrition and Physical Activity*, *17*(141). <https://link.springer.com/article/10.1186/s12966-020-01037-z>
- Christiansen, L., Beck, M. M., Bilenberg, N., Wienecke, J., Astrup, A., & Lundbye-Jensen, J. (2019). Effects of exercise on cognitive performance in children and adolescents with ADHD: Potential mechanisms and evidence-based recommendations. *Journal of Clinical Medicine*, *8*(6), 841.
- Columna, L., Prieto, L., Elias-Revolledo, G., & Haegele, J. A. (2020). The perspectives of parents of youth with disabilities toward physical activity: A systematic review. *Disability and Health Journal*, *13*(2), 100851.
- Cortés Pascual, A., Moyano Muñoz, N., & Quilez Robres, A. (2019). The relationship between executive functions and academic performance in primary education: Review and meta-analysis. *Frontiers in Psychology*, *10*, 1582.
- Daly-Smith, A. J., Zwolinsky, S., McKenna, J., Tomporowski, P. D., Defeyter, M. A., & Manley, A. (2018). Systematic review of acute physically active learning and classroom movement breaks on children’s physical activity, cognition, academic performance, and classroom behavior: Understanding critical design features. *BMJ Open Sport & Exercise Medicine*, *4*(1), e000341.
- Densley, B., Calvert, H. G., Boedeker, P., & Turner, L. (2021). Implementation of physical activity in us elementary schools: The role of administrative support,

## LET THEM MOVE

financial resources, and champions. *International Journal of Environmental Research and Public Health*, 18(9), 4476.

Desautels, L. (2016, September 16). *Energy and calm: Brain breaks and focused-attention practices*. Edutopia. <https://www.edutopia.org/blog/brain-breaks-focused-attention-practices-lori-desautels>

Diamond, A., & Ling, D. S. (2019). Review of the evidence on, and fundamental questions about, efforts to improve executive functions, including working memory. *Cognitive and Working Memory Training: Perspectives from Psychology, Neuroscience, and Human Development*, 143.

Dinkel, D., Schaffer, C., Snyder, K., & Lee, J. M. (2017). They just need to move: Teachers' perception of classroom physical activity breaks. *Teaching and Teacher Education*, 63, 186-195.

Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: a systematic review. *Medicine and Science in Sports and Exercise*, 48(6), 1197.

Dunton, G. F., Chu, D., Naya, C. H., Belcher, B. R., & Mason, T. B. (2021). Associations of mothers' and children's stress with children's device-measured physical activity and sedentary behavior trajectories across 3 years. *Journal of Physical Activity and Health*, 18(5), 477-487.

Egger, F., Benzing, V., Conzelmann, A., & Schmidt, M. (2019). Boost your brain, while having a break! The effects of long-term cognitively engaging physical activity

## LET THEM MOVE

breaks on children's executive functions and academic achievement. *PloS One*, *14*(3), e0212482.

Elementary School Principal Demographics and Statistics. (2023, July 21). *Number of elementary school principals in the US*. <https://www.zippia.com/elementary-school-principal-jobs/demographics/>

Evaristo, S., Moreira, C., Lopes, L., Oliveira, A., Abreu, S., Agostinis-Sobrinho, C., Santos, J.O., Povoas, S., Santos, R., & Mota, J. (2019). Muscular fitness and cardiorespiratory fitness are associated with health-related quality of life: Results from labmed physical activity study. *Journal of Exercise Science & Fitness*, *17*(2), 55-61.

Fedewa, A. L., Fettrow, E., Erwin, H., Ahn, S., & Farook, M. (2018). Academic-based and aerobic-only movement breaks: Are there differential effects on physical activity and achievement? *Research Quarterly for Exercise and Sport*, *89*(2), 153-163.

Fiscal, R. K. (2021). *Let them move: Why children need more movement in schools & 100+ activities for the classroom*. Rebecca Kramer Fiscal.

Flippin, M., Clapham, E. D., & Tutwiler, M. S. (2021). Effects of using a variety of kinesthetic classroom equipment on elementary students' on-task behaviour: A pilot study. *Learning Environments Research*, *24*, 137-151.

Frisbie, D. A. (2005). Measurement 101: Some fundamentals revisited. *Educational Measurement: Issues and Practice*, *24*(3), 21–28. <https://doi.org/10.1111/j.1745-3992.2005.00016.x>

## LET THEM MOVE

- Fühner, T., Kliegl, R., Arntz, F., Kriemler, S., & Granacher, U. (2021). An update on secular trends in physical fitness of children and adolescents from 1972 to 2015: A systematic review. *Sports Medicine*, *51*, 303-320.
- García-Hermoso, A., Alonso-Martinez, A. M., Ramírez-Vélez, R., & Izquierdo, M. (2020). Effects of exercise intervention on health-related physical fitness and blood pressure in preschool children: A systematic review and meta-analysis of randomized controlled trials. *Sports Medicine*, *50*, 187-203.
- Ginis, K. A. M., van der Ploeg, H. P., Foster, C., Lai, B., McBride, C. B., Ng, K., Pratt, M., Shirazipour, C.H., Smith, B., Vasquez, P., & Heath, G. W. (2021). Participation of people living with disabilities in physical activity: A global perspective. *The Lancet*, *398*(10298), 443-455.
- Godwin, K. E., Almeda, M. V., Seltman, H., Kai, S., Skerbetz, M. D., Baker, R. S., & Fisher, A. V. (2016). Off-task behavior in elementary school children. *Learning and Instruction*, *44*, 128-143.
- Grasdalsmoen, M., Eriksen, H. R., Lønning, K. J., & Sivertsen, B. (2020). Physical exercise, mental health problems, and suicide attempts in university students. *BMC Psychiatry*, *20*(1), 1-11.
- Gregory, J. W. (2019). Prevention of obesity and metabolic syndrome in children. *Frontiers in Endocrinology*, *10*, 669.
- Guirado, T., Chambonnière, C., Chaput, J. P., Metz, L., Thivel, D., & Duclos, M. (2021). Effects of classroom active desks on children and adolescents' physical activity, sedentary behavior, academic achievements, and overall health: A systematic

## LET THEM MOVE

- review. *International Journal of Environmental Research and Public Health*, 18(6), 2828.
- Hasson, R. E., Beemer, L. R., Eisman, A. B., & Friday, P. (2023). Closing the gap between classroom-based physical activity intervention adoption and fidelity in low-resource schools. *Kinesiology Review*, 12(1), 1-11.
- Headley, C. (2013). Teachers' knowledge of anxiety and identification of excessive anxiety in children. *Australian Journal of Teacher Education*, 38(5), 48-66.
- Horvat, M., Croce, R. V., Pesce, C., & Fallaize, A. E. (2019). *Developmental and adapted physical education: Making ability count*. Routledge.
- Howie, E. K., Beets, M. W., & Pate, R. R. (2014). Acute classroom exercise breaks improve on-task behavior in 4th and 5th grade students: A dose–response. *Mental Health and Physical Activity*, 7(2), 65-71.
- Invernizzi, P. L., Crotti, M., Bosio, A., Cavaggioni, L., Alberti, G., & Scurati, R. (2019). Multi-teaching styles approach and active reflection: Effectiveness in improving fitness level, motor competence, enjoyment, amount of physical activity, and effects on the perception of physical education lessons in primary school children. *Sustainability*, 11(2), 405.
- Janssen, M., Chinapaw, M. J. M., Rauh, S. P., Toussaint, H. M., Van Mechelen, W., & Verhagen, E. A. L. M. (2014). A short physical activity break from cognitive tasks increases selective attention in primary school children aged 10–11. *Mental Health and Physical Activity*, 7(3), 129-134.
- Johnstone, K.M., Kemps, E. & Chen, J. (2018). A meta-analysis of universal school-based prevention programs for anxiety and depression in children. *Clinical Child*

## LET THEM MOVE

*and Family Psychology Review*, 21, 466–481. <https://doi.org/10.1007/s10567-018-0266-5>

Kapsal, N. J., Dicke, T., Morin, A. J., Vasconcellos, D., Maiano, C., Lee, J., & Lonsdale, C. (2019). Effects of physical activity on the physical and psychosocial health of youth with intellectual disabilities: A systematic review and meta-analysis.

*Journal of Physical Activity and Health*, 16(12), 1187-1195.

Katzmarzyk, P. T., Powell, K. E., Jakicic, J. M., Troiano, R. P., Piercy, K., Tennant, B., & 2018 Physical Activity Guidelines Advisory Committee. (2019). Sedentary behavior and health: Update from the 2018 physical activity guidelines advisory committee. *Medicine and Science in Sports and Exercise*, 51(6), 1227-1241.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6527341/>

Kelly, L. E. (2019). *Adapted physical education national standards*. Human Kinetics Publishers.

Köchli, S., Endes, K., Steiner, R., Engler, L., Infanger, D., Schmidt-Trucksäss, A., Zahner, L. & Hanssen, H. (2019). Obesity, high blood pressure, and physical activity determine vascular phenotype in young children. *Hypertension*, 73(1), 153-161.

Kohl III, H. W., & Cook, H. D. (Eds). (2013). Physical activity, fitness, and physical education: Effects on academic performance. *National Academies Press*.

Kontostoli, E., Jones, A. P., Pearson, N., Foley, L., Biddle, S. J., & Atkin, A. J. (2021). Age related change in sedentary behavior during childhood and adolescence: A systematic review and meta analysis. *Obesity Reviews*, 22(9), e13263.

## LET THEM MOVE

- Korb, K. (n.d.). *Write Questionnaire Items*. Conducting Educational Research. <http://koredpsych.com/R09dItems.html>
- Kuzik, N., da Costa, B. G., Hwang, Y., Verswijveren, S. J., Rollo, S., Tremblay, M. S., Belanger, S., Carson, V., Davis, M., Hornby, S., Huang, W.Y., Law, B., Tomasone, J., Wachira, L.J., Wijndaele, K., & Saunders, T. J. (2022). School-related sedentary behaviours and indicators of health and well-being among children and youth: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *19*(1), 1-32.
- Le, T. T. H., Tran, T., Trinh, T. P. T., Nguyen, C. T., Nguyen, T. P. T., Vuong, T. T., Vu, T.H., Bui, D.Q., Vuong, H.M., Hoang, P.H., Nguyen, M.H., Ho, M.T., & Vuong, Q. H. (2019). Reading habits, socioeconomic conditions, occupational aspiration, and academic achievement in Vietnamese junior high school students. *Sustainability*, *11*(18), 5113.
- Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P. T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *The Lancet*, *380*(9838), 219-229.
- Lee, S. M., Burgeson, C. R., Fulton, J. E., & Spain, C. G. (2007). Physical education and physical activity: Results from the school health policies and programs study - 2006. *Journal of School Health*, *77*(8), 435-463.
- Leeb, R. T., Bitsko, R. H., Radhakrishnan, L., Martinez, P., Njai, R., & Holland, K. M. (2020). Mental health-related emergency department visits among children aged

## LET THEM MOVE

- < 18 years during the COVID-19 pandemic: United States, January 1 - October 17, 2020. *Morbidity and Mortality Weekly Report*, 69(45), 1675.
- Leland, M. (2015). Mindfulness and student success. *Journal of Adult Education*, 44(1), 19-24.
- Lemov, D. (2010). *Teach like a champion: 49 techniques that put students on a path to college*. Jossey-Bass.
- Liang, X., Li, R., Wong, S. H., Sum, R. K., & Sit, C. H. (2021). The impact of exercise interventions concerning executive functions of children and adolescents with attention-deficit/hyperactive disorder: A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 18(1), 68.
- Lindberg, L., Hagman, E., Danielsson, P., Marcus, C., & Persson, M. (2020). Anxiety and depression in children and adolescents with obesity: A nationwide study in Sweden. *BMC Medicine*, 18(1), 1-9.
- Liu, Y., & Chen, S. (2021). Physical literacy in children and adolescents: Definitions, assessments, and interventions. *European Physical Education Review*, 27(1), 96-112.
- Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., Kelly, P., Smith, J., Raine, L., & Biddle, S. (2016). Physical activity for cognitive and mental health in youth: A systematic review of mechanisms. *Pediatrics*, 138(3).
- Malar, S., & Maniazhagu, D. (2020). Effects of integrative neuromuscular training combined with yoga and stretching exercises on abdominal strength endurance of primary school children. *Indian Journal of Public Health Research &*



## LET THEM MOVE

*Development*, 11(3), 899-903. <https://medicopublication.com/index.php/ijphrd/article/view/1484>

Masini, A., Marini, S., Gori, D., Leoni, E., Rochira, A., & Dallolio, L. (2020). Evaluation of school-based interventions of active breaks in primary schools: A systematic review and meta-analysis. *Journal of Science and Medicine in Sport*, 23(4), 377-384.

Mavilidi, M. F., Drew, R., Morgan, P. J., Lubans, D. R., Schmidt, M., & Riley, N. (2020). Effects of different types of classroom physical activity breaks on children's on task behavior, academic achievement, and cognition. *Acta Paediatrica*, 109(1), 158-165.

McMullen, J., Kulinna, P., & Cothran, D. (2014). Physical activity opportunities during the school day: Classroom teachers' perceptions of using activity breaks in the classroom. *Journal of Teaching in Physical Education*, 33(4), 511-527.

Mechler, K., Banaschewski, T., Hohmann, S., & Häge, A. (2022). Evidence-based pharmacological treatment options for ADHD in children and adolescents. *Pharmacology & Therapeutics*, 230, 107940.

Melo, S. (2022, January 5). *Advantages of using online surveys*. DataScope.

<https://datascope.io/en/blog/advantages-of-using-online-surveys-2/>

Mercier, K., Centeio, E., Garn, A., Erwin, H., Marttinen, R., & Foley, J. (2021). Physical education teachers' experiences with remote instruction during the initial phase of the COVID-19 pandemic. *Journal of Teaching in Physical Education*, 40(2), 337-342.

## LET THEM MOVE

- Minghetti, A., Donath, L., Zahner, L., Hanssen, H., & Faude, O. (2021). Beneficial effects of an intergenerational exercise intervention on health-related physical and psychosocial outcomes in Swiss preschool children and residential seniors: A clinical trial. *PeerJ*, 9, e11292.
- Mintjens, S., Menting, M. D., Daams, J. G., van Poppel, M. N., Roseboom, T. J., & Gemke, R. J. (2018). Cardiorespiratory fitness in childhood and adolescence affects future cardiovascular risk factors: a systematic review of longitudinal studies. *Sports Medicine*, 48, 2577-2605.
- Mohammad Gholinejad, P., Hojjati, H., & Ghorbani, S. (2019). The effect of aerobic exercise on body composition and muscle strength of female students at elementary schools of Ali Abad Katoul in 2018. *International Journal of School Health*, 6(4), 27-33.
- Mora-Gonzalez, J., Esteban-Cornejo, I., Cadenas-Sanchez, C., Migueles, J. H., Rodriguez-Ayllon, M., Molina-García, P., Hillman, C., Catena, A., Pontifex, M., & Ortega, F. B. (2019). Fitness, physical activity, working memory, and neuroelectric activity in children with overweight/obesity. *Scandinavian Journal of Medicine & Science in Sports*, 29(9), 1352-1363.
- Moradi, A., Sadri Damirchi, E., Narimani, M., Esmaeilzadeh, S., Dziembowska, I., Azevedo, L. B., & Luiz do Prado, W. (2019). Association between physical and motor fitness with cognition in children. *Medicina*, 55(1), 7.
- Mullins, N. M., Michaliszyn, S. F., Kelly-Miller, N., & Groll, L. (2019). Elementary school classroom physical activity breaks: Student, teacher, and facilitator perspectives. *Advances in Physiology Education*, 43(2), 140-148.

## LET THEM MOVE

- Nayak, M. S. D. P., & Narayan, K. A. (2019). Strengths and weaknesses of online surveys. *Technology*, 6(7), 0837-2405053138.
- Neville, R. D., Lakes, K. D., Hopkins, W. G., Tarantino, G., Draper, C. E., Beck, R., & Madigan, S. (2022). Global changes in child and adolescent physical activity during the COVID-19 pandemic: A systematic review and meta-analysis. *JAMA Pediatrics*.
- Nittari, G., Scuri, S., Petrelli, F., Pirillo, I., Di Luca, N. M., & Grappasonni, I. (2019). Fighting obesity in children from European World Health Organization member states: Epidemiological data, medical-social aspects, and prevention programs. *La Clinica Terapeutica*, 170(3), e223-e230.
- Norris, E., van Steen, T., Direito, A., & Stamatakis, E. (2020). Physically active lessons in schools and their impact on physical activity, educational, health and cognition outcomes: a systematic review and meta-analysis. *British Journal of Sports Medicine*, 54(14), 826-838.
- Ohio Department of Education. (2023, January). *Facts and figures*. <https://education.ohio.gov/Media/Facts-and-Figures>
- Packham, A., & Street, B. (2019). The effects of physical education on student fitness, achievement, and behavior. *Economics of Education Review*, 72, 1-18.
- Pangrazi, R. P., & Beighle, A. (2019). *Dynamic physical education for elementary school children*. Human Kinetics Publishers.
- Pearl, J. (2009). Causal inference in statistics: An overview. *Statistics Surveys*, 3, 96-146. <https://doi.org/10.1214/09-SS057>

## LET THEM MOVE

- Pekari, B. L. (2022). *The mindful movement curriculum for K-6th grade students* [Doctoral dissertation, California State University, Sacramento]. ScholarWorks.
- Perera, T., Frei, S., Frei, B., & Bobe, G. (2015). Promoting physical activity in elementary schools: Needs assessment and a pilot study of brain breaks. *Journal of Education and Practice*, 6(15), 55-64.
- Physical Activity Alliance. (2022). *The 2022 United States report card on physical activity for children and youth summary*. <https://www.activehealthykids.org/wp-content/uploads/2022/11/US-report-card-short-form-2022.pdf>
- Piercy, K. L., Troiano, R. P., Ballard, R. M., Carlson, S. A., Fulton, J. E., Galuska, D. A., George, S., & Olson, R. D. (2018). The physical activity guidelines for Americans. *Jama*, 320(19), 2020-2028.
- Pohl, D., Alpous, A., Hamer, S., & Longmuir, P. E. (2019). Higher screen time, lower muscular endurance, and decreased agility limit the physical literacy of children with epilepsy. *Epilepsy & Behavior*, 90, 260-265.
- Puccinelli, P. J., da Costa, T. S., Seffrin, A., de Lira, C. A. B., Vancini, R. L., Nikolaidis, P. T., Knechtle, B., Rosemann, T., Hill, L., & Andrade, M. S. (2021). Reduced level of physical activity during COVID-19 pandemic is associated with depression and anxiety levels: An internet-based survey. *BMC Public Health*, 21, 1-11.
- Pushkarenko, K., Dunn, J. C., & Goodwin, D. L. (2021). Physical literacy for children labeled with autism spectrum disorder: Mothers' experiences of ableism, exclusion, and trauma. *Adapted Physical Activity Quarterly*, 38(4), 525-545.

## LET THEM MOVE

- Rhodes, R. E., Guerrero, M. D., Vanderloo, L. M., Barbeau, K., Birken, C. S., Chaput, J. P., Faulkner, G., Janssen, I., Madigan, S., Masse, L. C., McHugh, T.L., Perdew, M., Stone, K., Shelley, J., Spinks, N., Tamminen, K.A., Tomasone, J. R., Ward, H., Welsh, F., & Tremblay, M. S. (2020). Development of a consensus statement on the role of the family in the physical activity, sedentary, and sleep behaviours of children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 1-31.
- Rodriguez-Ayllon, M., Cadenas-Sánchez, C., Estévez-López, F., Muñoz, N. E., Mora-Gonzalez, J., Migueles, J. H., Molina-Garcia, P., Henrikson, H., Mena-Molina, A., Martinez-Vizcaino, V., Catena, A., Lof, M., Erickson, K., Lubans, D., Ortega, F., & Esteban-Cornejo, I. (2019). Role of physical activity and sedentary behavior in the mental health of preschoolers, children, and adolescents: A systematic review and meta-analysis. *Sports Medicine*, 49(9), 1383-1410.
- Rosholt, H. (2021). *Impact of school-based mindfulness programs in elementary schools* [Masters thesis, Concordia University - St. Paul]. [https://digitalcommons.csp.edu/teacher-education\\_masters/47/](https://digitalcommons.csp.edu/teacher-education_masters/47/)
- Sandercock, G. R., & Cohen, D. D. (2019). Temporal trends in muscular fitness of English 10-year-olds 1998–2014: An allometric approach. *Journal of Science and Medicine in Sport*, 22(2), 201-205.
- Sampasa-Kanyinga, H., Colman, I., Goldfield, G. S., Janssen, I., Wang, J., Podinic, I., Tremblay, M., Saunders, T., Sampson, M., & Chaput, J. P. (2020). Combinations of physical activity, sedentary time, and sleep duration and their associations with depressive symptoms and other mental health problems in children and

## LET THEM MOVE

adolescents: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 1-16.

Santana, C. C. D. A., Azevedo, L. B. D., Cattuzzo, M. T., Hill, J. O., Andrade, L. P., & Prado, W. L. D. (2017). Physical fitness and academic performance in youth: A systematic review. *Scandinavian Journal of Medicine & Science in Sports*, 27(6), 579-603.

Sanyaolu, A., Okorie, C., Qi, X., Locke, J., & Rehman, S. (2019). Childhood and adolescent obesity in the United States: A public health concern. *Global Pediatric Health*, 6. <https://doi.org/10.1177/2333794X19891305>

Schmidt, M., Jäger, K., Egger, F., Roebbers, C. M., & Conzelmann, A. (2015). Cognitively engaging chronic physical activity, but not aerobic exercise, affects executive functions in primary school children: A group-randomized controlled trial. *Journal of Sport and Exercise Psychology*, 37(6), 575-591.

Schwartz, S., & Riser-Kositsky, M. (2023, September 22). *What does a school principal do? An explainer*. Education Week. <https://www.edweek.org/leadership/what-does-a-school-principal-do-an-explainer/2023/09>

Shahidi, S. H., Williams, J. S., & Hassani, F. (2020). Physical activity during COVID-19 quarantine. *Acta Paediatrica*, 109(10), 2147.

Shannon, J. V. (2023, September 12). 7 Biggest challenges for teachers in 2022: According to teachers. *TeacherVision*. <https://www.teachervision.com/blog/morning-announcements/biggest-challenges-for-teachers>

## LET THEM MOVE

- Smith, J. J., Eather, N., Weaver, R. G., Riley, N., Beets, M. W., & Lubans, D. R. (2019). Behavioral correlates of muscular fitness in children and adolescents: A systematic review. *Sports Medicine*, *49*, 887-904.
- Sneck, S., Viholainen, H., Syväoja, H., Kankaapää, A., Hakonen, H., Poikkeus, A. M., & Tammelin, T. (2019). Effects of school-based physical activity on mathematics performance in children: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, *16*(1), 1-15.
- Stavridou, A., Kapsali, E., Panagouli, E., Thirios, A., Polychronis, K., Bacopoulou, F., Psaltopoulou, T., Tsoloia, M., Sergentanis, T. N., & Tsitsika, A. (2021). Obesity in children and adolescents during COVID-19 pandemic. *Children*, *8*(2), 135.
- Stricker, P. R., Faigenbaum, A. D., & McCambridge, T. M. (2021). Resistance training for children and adolescents. In American Academy of Pediatrics, *Pediatric collections: Sports medicine playbook* (pp. 243–255). [https://doi.org/10.1542/9781610026109-risks\\_and\\_benefits\\_ch05](https://doi.org/10.1542/9781610026109-risks_and_benefits_ch05)
- Sullivan G. M. (2011). A primer on the validity of assessment instruments. *Journal of Graduate Medical Education*, *3*(2), 119–120. <https://doi.org/10.4300/JGME-D-11-00075.1>
- Sun, W., Yu, M., & Zhou, X. (2022). Effects of physical exercise on attention deficit and other major symptoms in children with ADHD: A meta-analysis. *Psychiatry Research*, 114509.
- Tandon, P. S., Kroshus, E., Olsen, K., Garrett, K., Qu, P., & McCleery, J. (2021). Socioeconomic inequities in youth participation in physical activity and sports.

## LET THEM MOVE

*International Journal of Environmental Research and Public Health*, 18(13), 6946.

Tatum, S. (2019, April 16). *End of day jitters* [Conference presentation abstract]. The eleventh annual science of wondering. <https://www.baylor.edu/soe/doc.php/334271.pdf>

Terado, Youki (2018, March). *Research-Tested Benefits of Breaks*. Edutopia. <https://www.edutopia.org/article/research-tested-benefits-breaks/>

Theis, N., Campbell, N., De Leeuw, J., Owen, M., & Schenke, K. C. (2021). The effects of COVID-19 restrictions on physical activity and mental health of children and young adults with physical and/or intellectual disabilities. *Disability and Health Journal*, 14(3), 101064.

Tilp, M., Scharf, C., Payer, G., Presker, M., & Fink, A. (2020). Physical exercise during the morning school break improves basic cognitive functions. *Mind, Brain, and Education*, 14(1), 24-31.

Torres-Acosta, N., O'Keefe, J. H., O'Keefe, C. L., Lavie, C. J. (2020). Cardiovascular effects of ADHD therapies: JACC review topic of the week. *Journal of the American College of Cardiology*, 76(7), 858-866.

Tremblay, M. S., Costas-Bradstreet, C., Barnes, J. D., Bartlett, B., Dampier, D., Lalonde, C., Leidl, R., Longmuir, P., McKee, M., Patton, R., Way, R., & Yessis, J. (2018). Canada's physical literacy consensus statement: process and outcome. *BMC Public Health*, 18(2), 1-18.



## LET THEM MOVE

- Trudeau, F., & Shephard, R. J. (2008). Physical education, school physical activity, school sports and academic performance. *International Journal of Behavioral Nutrition and Physical Activity*, 5(1), 1-12.
- Tse, C. Y. A., Lee, H. P., Chan, K. S. K., Edgar, V. B., Wilkinson-Smith, A., & Lai, W. H. E. (2019). Examining the impact of physical activity on sleep quality and executive functions in children with autism spectrum disorder: A randomized controlled trial. *Autism*, 23(7), 1699-1710.
- Tsoi, M. F., Li, H. L., Feng, Q., Cheung, C. L., Cheung, T. T., & Cheung, B. M. (2022). Prevalence of childhood obesity in the United States in 1999–2018: A 20-year analysis. *Obesity Facts*, 15(4), 560-569.
- U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans* (2nd eds).
- Viola, T. W., & Nunes, M. L. (2022). Social and environmental effects of the COVID-19 pandemic on children. *Jornal de Pediatria*, 98, 4-12.
- Visible Learning. (2017, November). *250+ influences on student achievement*.  
<https://visible-learning.org/wp-content/uploads/2018/03/VLPLUS-252-Influences-Hattie-ranking-DEC-2017.pdf>
- Waters, J.T., Marzano, R.J., & McNulty, B. (2003). Balanced leadership: What 30 years of research tells us about the effect of leadership on student achievement: A working paper. *Mid-Continent Research for Education and Learning*, 2-19.
- Watson, A. J., Timperio, A., Brown, H., & Hesketh, K. D. (2019). A pilot primary school active break program (ACTI-BREAK): Effects on academic and physical activity

## LET THEM MOVE

- outcomes for students in years 3 and 4. *Journal of Science and Medicine in Sport*, 22(4), 438-443.
- Weaver, R. G., Webster, C. A., Beets, M. W., Brazendale, K., Schisler, L., & Aziz, M. (2018). An intervention to increase students' physical activity: A 2-year pilot study. *American Journal of Preventive Medicine*, 55(1), e1-e10.
- Webster, C. A., D'Agostino, E., Urtel, M., McMullen, J., Culp, B., Loiacono, C. A. E., & Killian, C. (2021). Physical education in the COVID era: Considerations for online program delivery using the comprehensive school physical activity program framework. *Journal of Teaching in Physical Education*, 40(2), 327-336.
- Webster, C. A., Rink, J. E., Carson, R. L., Moon, J., & Gaudreault, K. L. (2020). The comprehensive school physical activity program model: A proposed illustrative supplement to help move the needle on youth physical activity. *Kinesiology Review*, 9(2), 112-121.
- Webster, E. K., Wadsworth, D. D., & Robinson, L. E. (2015). Preschoolers' time on-task and physical activity during a classroom activity break. *Pediatric Exercise Science*, 27(1), 160-167.
- Wegner, M., Amatriain-Fernández, S., Kaulitzky, A., Murillo-Rodriguez, E., Machado, S., & Budde, H. (2020). Systematic review of meta-analyses: Exercise effects on depression in children and adolescents. *Frontiers in Psychiatry*, 11, 81.
- Wold, H. J. (2019). *Reading Fluency and GoNoodle© Brain Breaks Among Elementary-Aged Children* [Thesis, Brigham Young University]. BYU Scholars Archive.

## LET THEM MOVE

- Wolfe, A. M., Lee, J. A., & Laurson, K. R. (2020). Socioeconomic status and physical fitness in youth: Findings from the NHANES national youth fitness survey. *Journal of Sports Sciences, 38*(5), 534-541.
- Woolford, S. J., Sidell, M., Li, X., Else, V., Young, D. R., Resnicow, K., & Koebnick, C. (2021). Changes in body mass index among children and adolescents during the COVID-19 pandemic. *Jama, 326*(14), 1434-1436.
- World Health Organization [WHO]. (2022, October 5). *Physical activity*.  
<https://www.who.int/news-room/fact-sheets/detail/physical-activity>
- Wouters, M., Evenhuis, H. M., & Hilgenkamp, T. I. (2020). Physical fitness of children and adolescents with moderate to severe intellectual disabilities. *Disability and Rehabilitation, 42*(18), 2542-2552.
- Wu, N., Bredin, S. S. D., Guan, Y., Dickinson, K., Kim, D. D., Chua, Z., Kaufman, K., Warburton, D. E. R. (2019). Cardiovascular health benefits of exercise training in persons living with type 1 diabetes: A systematic review and meta-analysis. *Journal of Clinical Medicine, 8*(2), 253. <https://doi.org/10.3390/jcm8020253>
- Wu, C., Xu, Y., Chen, Z., Cao, Y., Yu, K., & Huang, C. (2021). The effect of intensity, frequency, duration, and volume of physical activity in children and adolescents on skeletal muscle fitness: A systematic review and meta-analysis of randomized controlled trials. *International Journal of Environmental Research and Public Health, 18*(18), 9640. <http://dx.doi.org/10.3390/ijerph18189640>
- Yale Law School. (2008). *The letters of Thomas Jefferson*: Jefferson's letter to Peter Carr 9/19/1785. Lillian Goldman Law Library. [https://avalon.law.yale.edu/18th\\_century/let31.asp](https://avalon.law.yale.edu/18th_century/let31.asp)

## LET THEM MOVE

Yuksel, H. S., Şahin, F. N., Maksimovic, N., Drid, P., & Bianco, A. (2020). School-based intervention programs for preventing obesity and promoting physical activity and fitness: A systematic review. *International Journal of Environmental Research and Public Health*, 17(1), 347. <https://doi.org/10.3390/ijerph17010347>

## **Appendix A**

### **Online Consent**

Greetings! I am a doctoral student at Youngstown State University, and I am completing my dissertation research on the importance of physical activity to students at the elementary school level. I am inviting you to participate in a short online survey.

The purpose of the survey is to identify the amount of physical activity students are getting within an elementary school day, elementary principal's beliefs on physical activity of students and identify possible barriers to students' physical activity. If you agree to take part in this study, you will be asked to complete a demographic question and complete a ten-item questionnaire on physical activity of students. You are receiving this email because you are an elementary school principal in the state of Ohio.

The ten-item survey will only take approximately ten minutes to complete.

You may not benefit directly from the research, but by participating in the study, you will provide meaningful information about the amount of physical activity students are getting, an awareness of benefits and the barriers involved in providing students physical activity. This information will provide a foundation for future research regarding the amount of physical activity students are getting at their elementary schools.

We believe this study has no known risks; however as with any online activity the risks related to confidentiality are always possible. To the best of our ability, your answers in this study will be kept confidential. We will minimize any risks by using the secure Google Form. The online survey will not collect personal information, such as emails or computer IP addresses. Your answers will be sent to and stored within the Google Form. No one, including the researcher will know if you participated in the study.

Your participation in the study is completely voluntary and you can withdraw at any time.

The online survey link will be open for two weeks. If you have questions about this project or have a problem with the survey, you may contact the researcher, Chad VanArnhem at xxx-xxx-xxxx or the Doctoral Chair, Dr. Karen Larwin, at xxx-xxx-xxxx. If you have questions about

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your rights as a participant in a research project, you may contact the Office of Research Services at [YSUIRB@ysu.edu](mailto:YSUIRB@ysu.edu) or at YSU 330-941-2377.

Thank you for your participation!

### Appendix B

#### Physical Activity Survey

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## Physical Activity Survey

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### ONLINE CONSENT

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Your participation in the study is completely voluntary and you can withdraw at any time.

The online survey link will be open for two weeks. If you have questions about this project or have a problem

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I am at least 18 years old, have read and understood this consent form, and you voluntarily agree to participate in this research study. Link to consent form: [Consent Form](#)

- Yes, I give my consent
- No, I do NOT give my consent

:::

What percentage of your student body qualifies for free and reduced lunch?

- 0-20%
- 21-40%
- 41-60%
- 61-80%
- 81-100%
- Unsure
- Other...

What setting best describes the location of your school?

- Inner City
- First Ring Suburb
- Suburb
- Rural
- Online
- Other: \_\_\_\_\_

## LET THEM MOVE

What is your gender?

- Male
- Female
- Do Not Want to Identify

How long have you been in education?

- 0-5 years
  - 6-10 years
  - 11-15 years
  - 16-20 years
  - Over 21 years
- 

How long have you been a principal?

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- Over 21 years



## LET THEM MOVE

What percentage of your student body qualifies for free and reduced lunch?

- 0-20%
- 21-40%
- 41-60%
- 61-80%
- 81-100%
- Unsure
- Other: \_\_\_\_\_

During the school day, how often do your students meet the recommended 60 minutes of physical activity during the school day.

- Never
- Once a week
- A few times a week
- Every day of the week
- I am unsure

Please rate your understanding of the effects of regular physical activity to student's academic growth.

- 1      2      3      4      5
- No Understanding                                    I understand it well enough to  
teach it to others

## LET THEM MOVE

Please rate your understanding of the effects of regular physical activity to a student's mental health.

1      2      3      4      5

No Understanding                                    I understand it well enough to teach it to others



What do you think the greatest benefits are to students that are provided with physical activity during the school day?



Paragraph



Long answer text



Required



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What are the challenges to implementing more physical activity in classrooms? (**select all that apply**)

- Not enough time to teach curriculum
- Not enough space or resources
- Not enough training and professional development for staff
- Do not know about the benefits of regular physical activity
- Teacher's negotiated agreement (union contract)
- No challenges exist
- Other

If selected "other" in the previous, please explain.

Your answer

---

Submit

Clear form

Never submit passwords through Google Forms.

## Appendix C

### YSU IRB Approval

Date: 12-31-2023

IRB #: 2024-101

Title: Let Them Move: Unleashing the Benefits of Physical Activity for School Children

Creation Date: 11-2-2023

End Date:

Status: **Approved**

Principal Investigator: Karen Larwin

Review Board: YSU IRB Board

Sponsor:

#### Study History

Submission Type	Initial	Review Type	Exempt	Decision	Exempt
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#### Key Study Contacts

Member	Initial	Role	Contact
Chad VanArnhem		Co-Principal Investigator	cvanarnhem@student.ysu.edu
Karen Larwin		Principal Investigator	khlarwin@ysu.edu
Karen Larwin		Primary Contact	khlarwin@ysu.edu

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On Dec 12, 2023, at 10:09 AM, Karen H Larwin <khlarwin@ysu.edu> wrote:

You will need the letter for your dissertation.

Karen

Begin forwarded message:

**From:** do-not-reply@cayuse.com  
**Date:** December 12, 2023 at 8:19:55 AM EST  
**To:** Chad VanArnhem <cvanarnhem@student.ysu.edu>, Karen H Larwin <khlarwin@ysu.edu>  
**Subject:** 2024-101 - Initial: Initial - Exempt



**YOUNGSTOWN  
STATE  
UNIVERSITY**

Dec 12, 2023 8:19:48 AM EST

Karen Larwin  
Teacher Ed and Leadership St

Re: Exempt - Initial - 2024-101 Let Them Move: Unleashing the Benefits of Physical Activity for School Children

Dear Dr. Karen Larwin:

Youngstown State University Human Subjects Review Board has rendered the decision below for Let Them Move: Unleashing the Benefits of Physical Activity for School Children

Decision: Exempt

Selected Category: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:  
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

Any changes in your research activity should be promptly reported to the Institutional Review Board and may not be initiated without IRB approval except where necessary to eliminate hazard to human subjects. Any unanticipated problems involving risks to subjects should also be promptly reported to the IRB.

The IRB would like to extend its best wishes to you in the conduct of this study.

Sincerely,  
Youngstown State University Human Subjects Review Board