THE EFFECTS OF DAILY PHYSICAL FITNESS ACTIVITIES ON FOURTH-GRADE STUDENTS

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By
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CERTIFICATION OF APPROVAL

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DEDICATION

This work is dedicated to all the family and friends that came alongside me during the course of my master's degree, test preparation, and thesis writing. During this time, I found out what true friendship and love for each other consisted of. Thank you for taking care of my children, my husband, and at times, my classroom. I could not have done it without each one of you.

To my husband, thank you for your support and for standing by my side during this journey. Also, to my children who were often pushed aside while I worked; I hope you always follow your dreams and realize that with hard work, you can achieve your goals.

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And lastly, I dedicate this work to my mother, Melissa Martin, who has stood by me in all the struggles I have endured over the course of achieving my Master's degree in School Administration. The calls of encouragement to keep going, the reading and rereading of my paper helped to get it just right. We may have been hundreds of miles apart, but you were always there when I needed you. Thank you.

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To our schools' Physical Education Specialist, Sally Oleson. Thank you for all the chats we had about what physical education should look like in the elementary setting and for working quickly before the shutdown of schools (COVID-19) to get test results turned in.

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ABSTRACT

The purpose of this study was to determine if there is a difference in physical fitness between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program. Children of all ages use social media, play video games, and surf the Internet all hours of the day. Consequently, children are not as active. Encouraging students to exercise regularly through school fitness programs may mitigate the problem of inactivity. In this study, the treatment group consisted of 64 fourth-grade students who received 200 minutes of physical education every ten days. Physical education activities included but were not limited to running, curl-ups, push-ups, Progressive Aerobic Cardiovascular Endurance Run (PACER), and team sports. The control group consisted of 63 fourth-grade students that received less than 40 minutes of physical education from a physical education specialist every ten days. The objective of this study was to compare students that receive the required 200 minutes of physical education every ten days and students that do not. An ANCOVA was used to determine if there were significant differences in physical fitness performance between the two groups. The alpha level was set at $<.05$. The results of the analysis showed no significant differences on the FitnessGram curl-ups, PACER, and trunk-lift tests in physical fitness between the two groups of students. However, the results showed a significant difference in physical fitness between the two groups on the FitnessGram push-up test in favor of the group that received 200 minutes of physical activity every ten days.

CHAPTER I

INTRODUCTION

Background

Many adult Americans remember the Presidential Physical Fitness Test when they were in school. This original presidential fitness test was created to assess student fitness. The test included curl-ups, a timed shuttle run, sit-and-reach, and sit-ups to name a few (Toporek, 2012).

After World War II, the nation's economy had significantly changed along with factory and farming jobs that required less physical labor due to the machines doing more of the labor. Televisions were seen more often in homes and Americans were found watching rather than doing. As noted by the John F. Kennedy Library and Museum, President Eisenhower understood that children were not as fit as those of other countries and he wanted to do something about it, which led to the establishment of the President's Council on Youth Fitness (U.S. Physical Fitness, n.d.).

Once John F. Kennedy (JFK) took office, he followed up on President Eisenhower's initiative and became committed to improve the fitness of the country. JFK's fitness program included a White House Committee on Health and Fitness in direct partnership with the Department of Health, Education, and Welfare. This led to the creation of a physical fitness pilot test in the 1961-1962 school year. The JFK Library noted the actions of the new president:

> In a general sense, the actions of the Kennedy council were a minor triumph of liberal Democratic thinking. A Nationwide problem was identified and a national response was developed through the resources of the federal government. The program produced a measurable improvement in fitness nationwide as well as a shift in public attitudes and wider participation. (U.S. Physical Fitness, n.d.)

In 1966, President Lyndon B. Johnson initiated The President's Challenge that included a fitness award for school age children in the United States. This test included curl-ups, a timed shuttle run, an endurance run/walk, and sit-and-reach to name a few.

The National Physical Education standards were established in 1995 and were revised in 2004. These standards describe what children should know and be able to accomplish at the end of second grade, fifth grade, eighth grade, and high school (Graber, Locke, Lambdin, & Solmon, 2008).

The physical fitness test was replaced with the Presidential Youth Fitness Program (PYFP) in 2013. The program works together with a public-private partnership between the President's Council on Fitness, Sports & Nutrition, the Centers for Disease Control and Prevention, Cooper Institute, SHAPE America, and the National Fitness Foundation. According to PYFP's website (as cited by Toporek, 2012), "The departure from the test, part of the President's Challenge, signals a move away from measuring students' performance and puts more emphasis on assessing students' health and lifelong physical activity." The fitness program is geared to keep

a positive mindset on fitness and is kept confidential between teacher, student, and parent. Awards of achievement are no longer given, yet now students and schools may receive recognition certificates for participation in the Presidential Youth Fitness Program.

In 1996, the California Department of Education (CDE) produced a physical fitness test called the "FitnessGram" that is administered to all 5th, 7th, and 9th graders in California. FitnessGram is an assessment that measures a student's physical and aerobic fitness levels in five key areas: aerobic capacity, body composition, flexibility, muscular strength, and muscle endurance.

Problem Statement

Children of all ages can be seen on social media, video games, and the internet all hours of the day. In 2015, Common Sense Media reported on average, 8 to15 year-olds spend over 4 hours a day using screen media including reading, television, social media, video games, and listening to music (The Common Sense Census, 2015). Consequently, children are not as active. Encouraging students to exercise regularly through school fitness programs may mitigate the problem of inactivity.

Research Question

What are the effects of a regularly scheduled exercise program on the physical fitness of fourth-grade students?

Null Hypotheses

H1. There is no significant difference in performance on the push-up test of the FitnessGram physical fitness assessment between fourth-grade students that

participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences.

H2. There is no significant difference in performance on the curl-up test of the FitnessGram physical fitness assessment between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a scheduled exercise program after controlling for pre-existing differences.

H3. There is no significant difference in performance on the trunk-lift test of the FitnessGram physical fitness assessment between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences.

H4. There is no significant difference in performance on the PACER test of the FitnessGram physical fitness assessment between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences.

Significance of the Study

The purpose of this study is to compare students that receive the required 200 minutes every ten days of physical education and students that do not. Hopefully, the study will provide useful information regarding the promotion of physical education

in schools. For example, the study may serve a useful purpose to policy makers and educators who wish to enhance physical education in the schools.

Limitations and Delimitations

Limitations

This study will be limited to 127 fourth-grade students in the central valley of California during the 2019-2020 school year.

Delimitations

For the purpose of this study, teacher experience, student gender and physical ability will not be taken into consideration.

Definition of Terms

Aerobic Capacity. The body's ability to take in, transport, and convert oxygen to energy during exercise.

Curl up. A physical fitness test that measures abdominal strength and endurance. A student lies on a mat with back flat, arms outstretched at sides and feet flat with knees up. A student needs to get back up off the mat far enough so fingertips cross a strip on the mat.

FitnessGram. A physical fitness program/test that measures student fitness levels using specific physical fitness activities. This is a national test of the Presidential Youth Fitness Program developed by The Cooper Institute.

Fitness Test: A test that measures aerobic capacity, body composition, flexibility, muscular strength, and muscular endurance.

Flexibility. The ability to bend parts of the body freely.

Healthy Fitness Zone: A range of good fitness that is determined by each of the five aerobic and physical fitness areas. (i.e., a 9 year old girl should perform greater than or equal to 9 curl-ups to reach a healthy fitness zone (HFZ).

Muscular Endurance. The ability to repeat muscular activity, over time.

Muscular Strength. The maximal force muscles can exert in a single effort.

Physical activity. Any bodily movement that produces energy.

Physical Fitness. The ability to carry out daily tasks with endurance.

Presidential Youth Fitness Program (PYFP). A program that promotes physical education through fitness education and assessment practices.

Push Up. A physical fitness test that measures upper body strength and flexibility. With a straight back a student must reach a minimum 90 degree bend in the elbows and return to the up position in a set pace.

Regularly Scheduled Exercise Program. A regular exercise program that consists of 200 minutes of physical activity every 10 days; 40 minutes with a certificated physical education specialist and 170 minutes with the classroom teacher. A program that is not regularly scheduled and consists of 40 minutes of physical activity with a certificated physical education specialist every 10 days.

Trunk Lift. A physical fitness test that measures trunk extensor strength and flexibility. A student lies on stomach with hands clasped behind back. Keeping feet on the mat, arches back up as far as possible to a position that can be maintained. Measure distance from chin to mat to determine trunk extensor flexibility score.

20m Progressive Aerobic Cardiovascular Endurance Run (PACER). A multistage shuttle run that is designed to measure aerobic capacity. Student runs back and forth across a 20-meter space at a pace that gets faster each minute. A PACER CD/audio recording is needed to hear the beep(s). A point is scored for each 20-meter distance covered. After two incomplete runs the test is completed.

Summary

Chapter One presented the purpose of this study, which is to compare the physical fitness of students who receive 200 minutes of physical education every 10 days, to students that do not receive 200 minutes every 10 days. Chapter Two will present research on the effects of physical fitness programs.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The purpose of this study is to determine if there is a difference in physical fitness between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program. This chapter presents a literature review that is pertinent to the topic of this study.

A Changing America

Life in America has drastically changed over the last 50 years with advancements in transportation, communication, technology, and the convenience of fast food. Fast food is often cheaper than buying healthier food options at the grocery store and also it is quick and easy after a busy day. High calorie and high-fat foods have made it easy to eat poorly. Also, technology contributes to less physical activity. Friends communicate more through computers and cell phones and seem to be less involved in the high-activity play. "Play" to the younger generations may be sitting in front of a television and pressing buttons on a video game controller. With a combination of unhealthy food and more idle sitting during the day, obesity is rising among children. According to Debra Eschmeyer, the Executive Director of the Let's Move! campaign (2017), "Over the past three decades, childhood obesity rates in

America have tripled, and currently in the US today, one in three children are overweight or obese."

The Center for Disease Control (CDC) website (2019) reported 13.9 million children and adolescents in the United States, ages 2-19, are affected by obesity with "13.9% among 2- to 5-year-olds, 18.4% among 6- to 11-year-olds, and 20.6% among 12- to 19-year-olds." Hispanics (25.8%) and African Americans (22.0%) experience a higher rate of obesity than whites (14.1%). Obesity is lowest among Asian Americans (11.0%). CDC (2019) research also shows that the rate of obesity is lower among adolescents in higher-income households. Children who are obese are more likely to have high blood pressure, type 2 diabetes, breathing problems, musculoskeletal discomfort, fatty liver disease, heartburn, and gallstones. Furthermore, these children are at a higher risk for anxiety, depression, low self-esteem, and social problems in school (CDC, 2015).

Inactiveness and weight gain among young people have led policymakers to take the initiative of encouraging schools and parents to get children to move and work towards the prevention of many diseases (Sallis et al., 2012). Several initiatives have received attention. In October of 2007, the NFL launched Play60, a program that targeted inner-city children to help them become aware of exercise, health, and wellness. The goal was to have children exercise for 60 minutes per day (Jones, 2007). In 2010, the Let's Move campaign, led by First Lady Michelle Obama asked for all to become aware of children's health and get kids moving. This program

encouraged 60 minutes of exercise per day and advised parents on how to create a healthy environment in the home (Eschmeyer, 2017).

In 2001, President George W. Bush signed the No Child Left Behind (NCLB) Act which held schools accountable for higher student academic achievement. The increased focus on academics and test preparation led many teachers to remove physical education from their daily curriculum. Jones found schools were offering more remedial classes and students were taking fewer electives, in turn placing physical education classes to the side (Jones, n.d.).

SHAPE America – Society of Health and Physical Educators, is a national organization that was founded in 1855. SHAPE America developed the National Standards for K-12 Physical Education. The organization's goal is to, “develop physically literate individuals who have the knowledge, skills, and confidence to enjoy a lifetime of healthful physical activity” (SHAPE America, 2016, p.14).

Few states require a minimum amount of time for daily physical activity regardless of the national standard of 30 minutes per day as the recommended amount of daily physical education. Only the District of Columbia and Oregon meet the national standard of 30 minutes of physical education each day in elementary and middle schools. Half the states allow students to opt-out of physical education and participate in activities/academics in lieu of state requirements. In a few states, districts may request their respective departments of education to waive PE requirements (SHAPE America, 2016).

Components of a Model Physical Education Program

Physical education has been linked to an increase in appropriate classroom behavior, memory, and concentration (Strong et al., 2005). Brusseau and Hannon (as cited by CDC, 2013 and NASPE, 2008) suggested implementing a program called Comprehensive School Physical Activity Programming (CSPAP). CSPAP is a multi-faceted approach where schools provide opportunities for students to be physically active, meet the recommendation of 60 minutes of physical activity per day, and develop the understanding, skills, and confidence to be physically active for a lifetime (SHAPE America, 2016).

CSPAP has five key components including physical activity before and after school, physical education during the school day, staff involvement, and family and community engagement. Physical activity before and after school must involve students practicing what they have learned in their physical education class that may include games, exercises, and team skills. Physical education is an academic subject designed to develop motor skills, behaviors for a healthy, active life, emotional intelligence, sportsmanship, and physical fitness. Physical activity during the school day involves recess, activity breaks inside the classroom after sitting for an extended period of time, and physical activity integrated into academic lessons. Staff involvement includes teachers and staff members committing to good health practices and integrating physical activity into the classroom. Finally, family and community engagement encourages families to be physically active and the community organizations can provide before and after school activities. When community and

family members come together, a connection is made between home, school, and community (SHAPE America, 2016).

Research Studies

Faigenbaum, Bush, McLoone, Kreckel, Farrell, Ratamess, and Kang (2015) conducted a study to examine the effects of integrative strength and skill-based training on measures of physical fitness in children in the fourth grade. The study was conducted in a New Jersey urban public school. The purpose of this study was to determine the effects of a regularly scheduled exercise program on physical fitness.

The authors have seen physical education (PE) in elementary-aged students change from a skill-centered model to a health-center model with a focus on moderate to vigorous physical activity (MVPA). The authors wanted to see if adding a formal fitness program to the first 15 minutes of a regularly scheduled PE class would show increases in the FitnessGram National Test for Physical Education. The program FIT (fundamental integrative training) is designed to enhance muscular fitness and fundamental movement skills with instruction, practice, and advancement based on when the students are capable of moving on. The 8-week program was conducted twice a week and included 6-7 physical exercise stations involving 30-second increments with a 30-second break in-between each station. After the rotations were complete, the students participated in a normally scheduled physical education activity. The authors chose two fourth-grade classes with a total of 41 students. One group of fourth-grade students participated in the FIT program and the other did not

participate in FIT. The latter group participated in the regularly scheduled PE class (Faigenbaum, 2015)

The authors used the FitnessGram National Test for Physical Education to measure growth. The fitness tests were used to assess growth in the standing long-jump and single-leg hop for lower body power, sit and reach for lower back flexibility, the progressive aerobic cardiovascular endurance run (PACER) to measure aerobic activity, and curl-up and push-up test to measure muscular fitness. There was a pre and post-test for both the control group and the group that incorporated FIT into the PE time (Faigenbaum, 2015).

The quantitative data from the pre and post-FitnessGram test for both the FIT and the control group were analyzed using an ANOVA. The overall finding showed significantly greater gains among students who participated in FIT (Faigenbaum, 2015).

Deutsch, Mahoney, Waldera, and Hetland (2019) conducted a study on students who received knowledge and skills training for the purpose of developing lifelong habits of physical activity. The purpose of the study was to analyze the effects of the Physical Best (PB) Curriculum versus a traditional program on activity levels of children in a physical education class. The study was conducted at an elementary school in the Midwest portion of the United States.

PB Curriculum was established in 1987 by SHAPE America with a goal to provide students with the education and skills needed to develop lifelong habits of physical activity, along with why and how the body responds to physical activity. PB

has teachers spend part of the PE period teaching PB fitness concepts then moving to team sport/game activities. The authors used students in grades 3 through 5 (92 total students, 50 males, and 42 females). Over a four-week period, the students either participated in PB or traditional activities for a total of six different class sections (2016).

Activity levels were recorded through movement tracking bracelets and heart rate monitors. Students' resting heart rates were recorded. The students' movement numbers and time-in-target-zone (TZ) values were analyzed and categorized into the number of times students spent in Moderate Intensity (50-70% of Maximum Heart Rate) to High Intensity (70-85% of Maximum Heart Rate). Target Zone and steps were averaged across all six sessions for both the traditional and the PB activity sessions. An ANOVA was used to compare gender and grade differences ($p < 0.05$).

When comparing PB and the traditional program with third-grade girls, they were the least affected with their average steps/day and their average time in zone/day. However, the third-grade boys did show a difference in their average steps/day (23.5% difference, $p=0.048$) and their average time in zone/day (29.7%, $p=0.002$). Both the 4th-grade boys and girls showed a difference in average steps/day (16.3% difference, $p=0.034$ and 26.7% difference, $p=0.024$ respectively) and average time in zone/day (22.7% difference, $p=0.000$ and 19.1% difference, $p=0.00$ respectively). The 5th-grade showed the greatest difference among all three grade levels and genders. In the average steps/day, the girls showed a 28.9% difference ($p=0.00$) while the boys had a difference of 37.7% ($p=0.001$). In the average time in

zone/day, the boys showed the greatest difference of 37.7% (p=0.001), and 36.1% difference (p=0.000) in average time in zone/day. There was a significant difference in the number of steps and heart rate at all grade levels in favor of students who participated I the PB sessions, particularly boys. However, there were no differences at the third-grade level for girls.

Deutsch, Waldera, Mahoney, and Martinez (2019) conducted a study on the second-year implementation of the Project Fit America (PFA) curriculum in a midwestern state in the United States. The purpose of the study was to compare the physical fitness scores of students who participated in the PFA curriculum and used non-traditional fitness equipment to those who participated in a regular physical education (PE) program. The authors wanted to see if the implementation of using PFA had any impact on the fitness levels of students on the basis of pre and post-FitnessGram National physical education test scores. The pre-test was conducted in October and the post-test in May.

The authors studied four groups, those who participated in the PFA program, male and female (EM and EF retrospectively) and those who did not participate in the PFA program (NEM and NEF). The items tested included push-ups, curl-ups, sit and reach, and the PACER (progressive aerobic cardiovascular endurance run). A grant was used to purchase PFA equipment and curriculum. PFA incorporates non-traditional outdoor equipment such as medicine balls, weighted jump ropes, and hula hoops while using intrinsic and extrinsic motivation to promote the five areas of

fitness: muscular strength, muscular endurance, cardiovascular endurance, flexibility, and body composition (Deutsch et al., 2019).

Quantitative performance data were collected in October and May from all four groups and then were analyzed using paired sample t-tests to see if there were significant and positive changes from pre to post-FitnessGram tests. The EM group showed significantly higher scores in their post-test scores for curl-ups ($p \leq 0.05$) and the PACER ($p \leq 0.05$), while the EF showed significantly higher scores in only the sit-and-reach ($p \leq 0.05$). The NEM group only showed significantly higher scores in the post-test scores for curl-ups ($p \leq 0.05$), while the NFM groups showed no significant change in any post-test activity (Deutsch et al., 2019).

Weimer (2013) conducted a study to understand how elementary schools maintain high-quality physical education programs in a state that does not require 150 minutes of physical education per week. The study was conducted at three different elementary schools, all in different districts within 50 miles of Pittsburgh, Pennsylvania. A qualitative, comparative case study research design was constructed and two research questions were established:

1) What does a high-quality elementary physical education program look like?

2) What are the enabling and constraining conditions?

Weimer (2013) contacted the Pennsylvania State Association for Health, Physical Education, Recreation, and Dance (PSAHPERD) to enquire about educational programs that are considered high-quality with an emphasis on obesity

prevention and life-long fitness. PSAHPERD recommended school programs in the state of Pennsylvania and the author chose three.

At each school, the researchers observed the PE program, reviewed the curriculum, the districts' websites, and performed semi-structured interviews. The researchers used purposeful sampling for selecting interview participants. The researchers interviewed a physical education teacher, a principal, the director of curriculum, a K-2 and 3-5 teacher, as well as a parent. All but one interview was conducted in person and each took 20-30 minutes. The questions focused on administrative and financial support, collaboration, content and instruction, assessment and accountability, professional preparation and development, and adaptive instruction (Weimer, 2013).

Three data analysis techniques were used in this study: pattern matching, explanation building, and cross-case synthesis. Pattern matching was used to code the collected data. Codes were assigned a color and the cycle of highlighting and coding continued for many rounds (Weimer, 2013).

The author suggested that the number one factor in a high-quality elementary physical education program is the physical education teacher. In all three cases, the teacher was in the profession for quite some time, maintained a willingness to change and try new things, and attended professional development opportunities, even on their own time. The teachers who showed the ability to explain and demonstrate the content to students in a meaningful way, were caring and had high-energy when delivering the lesson. The second factor for a high-quality program was positive,

active collaboration among the PE teachers and administrator. This relationship helped administrators recognize the need for physical education in the school curriculum and understand the benefits to the students' overall health and wellness. Another key factor in a high-quality physical education program is multiple forms of student assessment during the year. The assessment data helps teachers identify program strengths and weaknesses (Weimer, 2013). The constraints that challenge a school from implementing a high-quality PE program are time, lack of state requirements and the lack of state assessment measures (Weimer, 2013).

Phillips (2017) conducted a study on the effects of a before-school physical education class. The purpose of the study was to examine a five-week, 4-days per week, 35-45 minutes per day early morning physical education program and its effects on students' academic achievement in math and reading. The study involved 26 students, 13 were in the intervention group and 13 were in the control group. The study was conducted in a mid-size city in the southeastern United States.

The students were chosen from a before school program. The intervention group participated in the "zero hour" physical activities, while the control group participated in the nonphysical activities of the program (i.e., crafts, games, reading). Intervention activities lasted for 35-40 minutes and included individual and team sports like basketball and soccer, jump rope, cone and ladder drills, and running games. Pre and post-academic assessments were administered to both groups to monitor academic growth as well as pre and post heights, weights, resting heart rates, and PACER test scores (Phillips, 2017).

An ANCOVA was used to compare mean differences between the intervention group and the control groups. There was no significant difference in math test scores between the groups; however, Phillips (2017) found there was a significant difference in reading scores in favor of those that participated in the zero-hour intervention group ($p<0.05$).

Summary

This chapter presented a review of the literature that is pertinent to research on students and elementary physical education. Chapter Three will describe the methodology of this study including the sample population, instrumentation, data collection, and quantitative analysis.

CHAPTER III

METHODS AND PROCEDURES

Introduction

The purpose of this study is to determine if there is a difference in physical fitness between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program. Hopefully, the results of this study will provide useful information regarding the promotion of physical education in schools. Chapter Three will present the sample population, data collection, instrumentation, and analysis.

Treatment Group

The treatment group consisted of 64 fourth-grade students from one of two schools from the same district who attended from 2019-2020. All students in the treatment group received 200 minutes of physical education every ten days. Physical education activities included but were not limited to, running, curl-ups, push-ups, Progressive Aerobic Cardiovascular Endurance Run (PACER), and team sports. Data regarding the need for students to make up time due to absences were not gathered and therefore, not taken into consideration. The objective of this study was to compare students that receive the required 200 minutes of physical education every ten days and students that do not.

Control Group

The control group consisted of 63 fourth-grade students from one of two schools in the same district who attended from 2019-2020. The participants were selected from schools in the district with similar demographics to the treatment group. All students in the treatment group received 40 minutes of physical education every ten days from a physical education specialist.

Methods, Procedures, and Subjects

Two classes of fourth-grade students from one school that have participated in a regularly scheduled exercise program and two classes of fourth-grade students from another school that have not participated in a regularly scheduled exercise program was selected for this study. This researcher used convenience sampling to select two classes from each of the two schools for a total of four classes of fourth graders. Each class consisted of a culturally and socio-economically diverse group of fourth-grade students. The selected schools were convenient because they are in the same school district and the school district was willing to provide pre and post-assessment scores of all participants for this study. Therefore, the schools and sampled students will not likely be representative of all fourth-grade students. This means the results may not generalize beyond the students who were studied. All participants and schools will remain confidential. Names of students and schools participating in the research will remain anonymous.

Instrumentation and Data Collection

FitnessGram National Test scores were collected and analyzed to determine if there was a difference in physical fitness performance between the two groups. FitnessGram has set national standards for youth fitness to help improve fitness and fight obesity. FitnessGram measures a child's aerobic capacity, flexibility, muscular strength, and muscular endurance. FitnessGram focuses on criterion-referenced standards that were developed by the FitnessGram Advisory Board. The physical fitness performance tests that were used were the Progressive Aerobic Cardiovascular Endurance Run (PACER), curl-up, trunk-lift, shoulder stretch, and push-up. Each assessment has a healthy fitness zone or needs improvement/at-risk zone. The district's physical education specialist administers the FitnessGram physical education assessment in September and March. The participating school district provided the anonymized scores for fourth-grade students who attended the participating schools in 2019-2020. FitnessGram National Test scores were collected and analyzed to determine if there is a difference in physical fitness performance between the two groups.

Statistical Analysis

An ANCOVA was used to determine if there were significant differences in physical fitness between fourth-grade students that have participated in a regularly scheduled exercise program and fourth-grade students that have not participated in a regularly scheduled exercise program after controlling for pre-existing differences. The alpha level set at $<.05$.

Summary

Chapter Three presented the methodology that includes the sample population, instrumentation, data collection, and analysis. Chapter Four will present the results of this study.

CHAPTER IV

RESULTS

Introduction

The purpose of this study is to determine if there is a difference in physical fitness performance between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program. This chapter will present the results of the analysis of covariance (ANVOCA) that was used to accept or reject the null hypotheses of this study.

Findings and Discussion Related to the Null Hypotheses

H1. Null Hypothesis: There is no significant difference in performance on the FitnessGram push-up test between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. An ANVOCA was used to analyze the data. The level of significance was set at .05. The results are presented in Table 1.

Table 1

FitnessGram Physical Fitness Test - Push-ups

Group	n	M	SD	F	P
Group 1	64	11.31	9.001	4.842	0.03*
Group 2	63	7.92	5.332		

*p < 0.05

The results suggest that the fourth-grade students that participated in a regularly scheduled exercise program scored significantly higher on the FitnessGram push-up test than the fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. Therefore, the null hypothesis was rejected.

H2. Null Hypothesis: There is no significant difference in performance on the FitnessGram curl-up test between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. An ANVOCA was used to analyze the data. The level of significance was set at .05. The results are presented in Table 2.

Table 2

FitnessGram Physical Fitness Test - Curl-ups

Group	n	M	SD	F	P
Group 1	64	23.55	14.773	0.849	0.359
Group 2	63	24.62	13.138		

The results suggest that there is no significant difference in performance on the FitnessGram curl-up test between the fourth-grade students that participated in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. Therefore, the null hypothesis was accepted.

H3. Null Hypothesis: There is no significant difference in performance on the FitnessGram trunk-lift test between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences.

An ANVOCA was used to analyze the data. The level of significance was set at .05. The results are presented in Table 3.

Table 3

FitnessGram Physical Fitness Test - Trunk-lift

Group	n	M	SD	F	P
Group 1	64	11.91	0.344	3.349	0.07
Group 2	63	11.71	0.831		

The results suggest that there is no significant difference in performance on the FitnessGram trunk-lift test between the fourth-grade students that participated in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. Therefore, the null hypothesis was accepted.

H4. Null Hypothesis: There is no significant difference in performance on the FitnessGram PACER test between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. An ANVOCA was used to analyze the data. The level of significance was set at .05. The results are presented in Table 4.

Table 4

FitnessGram Physical Fitness Test – PACER

Group	n	M	SD	F	P
Group 1	64	19.62	10.629	3.2	0.076
Group 2	63	15.25	8.42		

The results suggest that there is no significant difference in performance on the FitnessGram PACER test between the fourth-grade students that participated in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. Therefore, the null hypothesis was accepted.

Summary

Chapter Four presented the results of the ANCOVA that were used to accept or reject the null hypothesis of this study. Chapter Five will present the conclusions, implications, and recommendations for further research.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The purpose of this study was to determine if there are differences in physical fitness performance between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program. Chapter Five presents conclusions, implications, and recommendations for further research.

Conclusions

An ANCOVA was used to determine if there was a significant difference in physical fitness performance between fourth-grade students that participate in a regularly scheduled exercise program and fourth-grade students that do not participate in a regularly scheduled exercise program after controlling for pre-existing differences. The alpha level was set at <.05. The results of the analyzes showed no significant differences in the FitnessGram curl-ups, PACER, and trunk-lift tests between the two groups of students. However, the results showed a significant difference between the two groups in the FitnessGram push-up test in favor of the students that participate in the regularly scheduled exercise program.

Implications

The results underscore the findings of a study by Faigenbaum, Bush, McLoone, Kreckel, Farrell, Ratamess, and Kang (2015). The study was conducted in a New

Jersey urban public school. The purpose of this study was to determine the effects of a regularly scheduled exercise program on the physical fitness of students. The authors wanted to see if adding a formal fitness program to the first 15 minutes of a regularly scheduled PE class would show improvement in the FitnessGram National Test for Physical Education. The 8-week program was conducted twice a week and included 6-7 physical exercise stations involving 30-second increments with a 30-second break in-between each station. After the rotations were complete, the students participated in a regularly scheduled physical education activity. The authors chose two fourth-grade classes with a total of 41 students. One group of fourth-grade students participated in the FIT program and the other did not participate in FIT. The latter group participated in the regularly scheduled PE class. The authors used the FitnessGram National Test for Physical Education to measure growth in the progressive aerobic cardiovascular endurance run (PACER), curl-up, and push-up test to measure muscular fitness. There was a pre and post-test for both the control group and the group that incorporated FIT into the PE time. The overall finding showed significantly greater gains among students who participated in FIT (Faigenbaum, 2015). This study as with others such as Faigenbaum (2015) reinforce the need to emphasize more physical skill activities in physical education classes that may include a dedicated amount of time, of at least 15 minutes, two days a week to skills such as curl-ups, trunk-lifts, PACER, and push-ups.

Recommendations for Future Research

Future research on the effects of physical education in an elementary school setting may include the following:

1. Conduct a quantitative study where students participate in a regularly scheduled physical education program with at least 15 minutes each session dedicated to state required skills.
2. Conduct a quantitative study to determine if the grade level of the students is a factor that affects physical fitness performance.

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