

Running head: PHYSICAL ACTIVITY

Physical Activity and Childhood Obesity

School Improvement Plan

Southeastern Louisiana University

Abstract

The purpose of this study is to determine if there is a direct correlation between increased amounts of time a student spends in physical education class and childhood obesity by lowering BMI scores of 5th grade students. The change in students' BMI scores was used to establish the successfulness of this study. Students in the treatment group received eighty minutes of physical activity class per week. Students in the comparison group received the regular forty minutes of physical activity class per week. Both groups participated in the President's Fitness Challenge over the six week time frame. This challenge consisted of five events measuring a child's heart and lung endurance, upper body strength, abdominal strength, flexibility, speed, and agility. After the six weeks of training for the President's Fitness challenge BMI scores were again measured. The treatment group demonstrated an average decrease of .473 in BMI scores, but the comparison group demonstrated an average decrease of .618 in BMI scores. Although the results did not support the original hypothesis, the importance of physical education is still evident. Health and physical fitness instruction should be placed at a high priority in a school's curriculum. The

engagement and education of physical activity is imperative to the health and well being of today's children.

Physical Activity and Childhood Obesity

Introduction

As a Physical Education teacher, assessing the students' BMI (body mass index) as an introduction to a healthy lifestyle was part of the curriculum. Promoting the idea that nutrition and exercise go hand in hand and that one was as important as the other was also imperative. In doing this, an extremely large amount of students fell into the category of being overweight or at risk for obesity. The prevalence of the problems surrounding a healthy lifestyle has led to an interest in the issue of childhood obesity.

It is through the school's Physical Education program and through the cafeteria that educators can begin to make a huge difference in our children leading a healthier lifestyle. Students can be educated on the importance of being active and eating healthy. By doing this, the enormous amount of children in the United States who are considered overweight can be reduced.

Rationale

From fast food to electronics, quick and easy seems to be the mindset of many people, young and old, in the new millennium. Helping children lead healthy lifestyles begins with you, the parent, the teacher, and leading by example. The percentage of overweight children in the United States is growing at an alarming rate. It is unfortunate that the children of our nation now, more than ever, are sedentary; children spend more time playing with electronic devices, from computers to handheld video game systems, than actively playing outside (Kids Health.org).

Research Question

Will an increased amount of physical activity from 40 minutes to 80 minutes a week lower the BMI of students in the fifth grade at Martha Vinyard Elementary School who are at risk of being overweight or obese?

Review of Literature

For many years, the United States has been combating the battle of obesity among children. In the year 2004, 9 million young children in the United States were considered overweight according to Body Mass Index-for-age percentiles (Van Staveren & Dale, 2004). This figure has approximately doubled since the 1970s. According to one research group, overweight among young Blacks and Hispanic children of school-age are becoming more and more common

(von Hippel, Powell, Downey, & Rowland, 2007). Doctors set apart being overweight and being obese by calculating body mass index(BMI). The BMI is calculated using a person's height and weight, and then comparing it to the BMI of other people of the same age and sex. According to the American Academy of Pediatrics they define a child with a body mass index at or above the 95th percentile for age and gender as overweight or obese. Children with a BMI between the 85th and 95th percentiles are considered to be at risk for overweight (Harper, 2006). Obesity is considered a consequence of a sedentary lifestyle (Yaussi, 2005). While the causes of obesity are still somewhat unclear, the principal contributors of this epidemic are primarily from an insufficient amount of physical activity and improper diet (Stewart, Dennison, Kohl, & Doyle 2004).

Researchers believe that schools are the suitable waterway for obesity prevention. The prevention methods schools have established for taking responsibility for the ongoing obesity problem are providing nutrition and physical activity education (Baranowski, Cullen, Nicklas, Thompson, & Baranowski, 2002). According to several articles, in order to educate children about a healthy lifestyle, the amount of time in school must be available. In order to give children the opportunity to be physically

active, the time in school must be available. In order for children to be knowledgeable of the importance of a healthy lifestyle and being physically fit, the time for an adequate physical education program must be in place. The reason for this is schools reach the greater part of children in the United States for a large number of days each year. It is believed that schools have opportunities (time) and resources (trained educators) to be victorious. Schools control food choices through the cafeteria, time spent in physical activity through P.E. classes, and chances to educate and inform through health classes (Van Staveren & Dale, 2004). "For this reason, the Centers for Disease Control and Prevention (CDC), the National Association for Sport and Physical Education (NASPE), and the American Heart Association all recommend comprehensive daily physical education for children K-12. Schools that promote physical activity may have a significant impact on reducing childhood obesity, chronic disease, and, ultimately, adult mortality (Summerfield, 1998)." What these associations suggest is that schools expand opportunities for all children to engage in at least 30 minutes of moderate to vigorous physical activity each day. They should offer physical education classes that last 30 to 60 minutes each day. If the opportunity for vigorous

activity isn't allowed more schools are going to continue to see obesity-related illnesses such as hypertension, type 2 diabetes, movement disorders, and asthma (Budd & Volpe, 2006). In addition to this, it is believed that school health services should measure each student's weight, height, and body mass index (BMI) each year and provide the results to the students and their families. This information would help families become aware of any weight concerns and track their children's growth. In the state of Arkansas, state legislatures are already implementing this plan for children and their parents. This allows parents to play an active role in assuring their child leads an active healthy lifestyle (Morantz & Torrey, 2004; Krisberg, 2005).

One article written in 2006 heavily placed the blame of inactive children on today's technology and society. Today's child is spending an average of 4 hours a day in front of some type of screen-television, computer, or video game. In today's society, the factors that are contributing to inactivity among children are un-safe neighborhoods resulting in children staying indoors. Also, in today's society a majority of families have both parent's working; so, children often spend after-school time home alone and can't go outdoors (Harper, 2006).

According to one study, a recent survey in 2001 found that parents blame schools for the insufficient amount of physical and health education for the rise in childhood obesity. As a result of this study, parent's dissatisfaction may help policy-makers increase the amount of time for physical education classes allowed in the school system (Child Obesity, 2001). In another study, it was presented that one extra hour of physical education in an elementary site compared with the time allowed for a normal physical education program reduces BMI among students who were overweight or at risk for becoming overweight (Datar & Sturm 2004). Daily exercise and healthy eating habits are the reason it is important for children to know how to prevent heart disease, cancer, and diabetes. It is just as important that children learn about healthy eating and exercise as it is to learn geography (Krisberg, 2005).

There are many benefits associated with regular physical activity including: reduction of the risk for becoming overweight, diabetes, and other chronic diseases, assists in improved academic performance, helps children self esteem, reduces the chance for depression, helps children prepare to be productive, healthy members of society, and improves overall quality of life (Is it

physical, 2005). It is believed by the majority of researchers that the keys to combating obesity are straightforward: daily physical activity along with good nutrition (Yaussi, 2005). According to an article by Kretchmar, if you ask any parent what they wanted most for their child they would say a happy, healthy, and well-adjusted child. Well, obesity creates both health risks and adjustment problems for children. So as educators of Physical Education the need for focusing on health and fitness is utmost important for the well being of our students (Kretchmar, 2006). And because almost all children spend significant amounts of time at school, increasing the amount of time spent in physical education class is one way to begin the fight for the current epidemic of childhood obesity that threatens the health and life span of our nation (Harper, 2006).

Operational Definitions

The measurement used to identify change in students' health will be the Body Mass Index. The Body Mass Index is used to assess a child's risk of being overweight or underweight. The calculation is made utilizing the height and weight of each student. The physical activity the students will be engaged in is preparation for the

President's Challenge. The President's Challenge is a program that encourages all Americans to make being active part of their everyday lives. No matter what your activity and fitness level, the President's Challenge can help motivate you to improve. The activities included in this challenge are the one mile run, shuttle run, pull ups, curl ups, and the V sit reach.

Goals and Objectives

The goals and objective for this study relate to improving the health and physical fitness of fifth grade students. The goals are: 1) to implement an increased amount of physical activity which will have an impact on lowering body mass index scores of fifth grade students at Martha Vinyard Elementary School, and 2) Fifth grade students at Martha Vinyard Elementary School will utilize knowledge gained about a healthy lifestyle and continue throughout their life. The objective is: 1) Students will demonstrate a lower Body Mass Index score on their posttest due to the increase amount of physical activity.

Methodology

Research Design

This study used the nonequivalent control group design. The researcher administered the treatment of extra physical activity to the treatment group. Intact groups

(pre-assigned classrooms) of students were used. A comparison group was used. The independent variable is the amount of time students will participate in physical education class each week. The levels of the independent variable are 40 minutes of physical education class and 80 minutes of physical education class. The dependent variable is body mass index.

Sample

A convenience sample of 51 10 to 11 year old students was used for this study. Two 5th grade classes from Martha Vinyard Elementary School will be chosen from a list obtained from the school. This is a public elementary school with an enrollment of 700 fifth and sixth grade students. The school is located in a rural area. Sixty percent are considered to be economically "at risk." The ethnic make-up of students is approximately 70 percent white, 29 percent black, and less than one percent Hispanic/Asian. Within the school, several students have been officially diagnosed with ADHD or ADD; many have 504 plans, while even more have Individual Evaluation Plans.

The students who were used for comparison were members of these two classes. Group 1 received the treatment of 80 minutes of physical activity per week. Eleven students in this group were considered at risk or

overweight at the beginning of the study. These are the students who were used for comparison to determine if there was a significant change in BMI with extra physical education time. Group 2 received the regular forty minutes of physical education. There were also 11 students who were considered at risk or overweight in this group. These students were also used to compare if a greater change in BMI occurred as a result of additional physical education.

Instrumentation

The researcher used Body Mass Index as the instrument for this study. A child's BMI is used to assess his or her risk of being overweight or underweight. Test-retest of students BMI was used for this study to determine reliability. Students measured and weighed themselves to calculate their BMI. Three scales and three height devices were validated prior to the study. In addition, students used the same scales and height devices for pre-test and post-test. Body Mass Index PowerPoint, Pre-test, post-test, weekly food log, pictures of students participating, and the President's fitness test scorecard are the artifacts included in this school improvement plan.

Procedures

This study was conducted in an elementary classroom during a normal physical education class. Two 5th grade classes consisting of 50 10 to 11 year old students was used for this study. At the beginning of class, an explanation of the study was given to the students. Students were informed that the study would begin with a pre-test on the computer. Before students were able to take the pre-test they weighed themselves on a digital bathroom scale and measured themselves using a height chart. Once students had this information, they went to the computer and logged on to the following website to calculate their body mass index:

http://www.kidshealth.org/parent/nutrition_fit/nutrition/bmi_charts.html.

For the next 8 weeks one group of students prepared for and participated in the President's Challenge by attending physical education classes for 80 minutes per week. The other group prepared and participated in the President's Challenge while attending physical education class for only 40 minutes per week. The President's Fitness Challenge consists of five events measuring the following: quickness, agility, speed, upper body strength, flexibility, and heart and lung endurance. At the end of the 8 weeks, students again measured themselves and weighed themselves using the same weight and height devices they

used for the pretest. Last, students utilized their new measurements to take a posttest at the same website to calculate their BMI. Eating habits of students cannot be controlled, but students were asked to keep a food journal during the study.

Timeline for Data Collection and Project Milestones	
Week	Activities
1	Introduce students to project; Begin pretest
2	Continue and Complete pretest
3	Stretch and Begin President's Fitness one mile run and shuttle run
4	Stretch and President's Fitness curl-ups, pull-ups and running
5	Stretch and President's Fitness v-sit and test one mile run
6	Stretch and retest President's Fitness v-sit and running
7	Stretch and retest curl ups, pull-ups and shuttle run
8	Stretch and retest the one mile run
9	Complete Posttest; Brief students on results
10	Analyze Results and Complete Portfolio

Results

The information collected from this study concerning the increased amount of physical activity from 40 minutes to 80 minutes indicated a decrease in BMI scores for both the treatment group and the comparison group. The comparison group demonstrated a greater change in the lowering of BMI scores. The average change for the treatment group of lowering their BMI scores was $-.473$. The average change for the comparison group in the lowering of their BMI scores was $-.618$. The BMI scores for the

treatment group decreased by 1.82 percent while the BMI scores for the comparison group decreased by 2.38 percent.

Table One illustrates the average change in BMI scores for the Treatment Group. Table Two illustrates the average change in BMI scores for the Comparison Group. Chart One illustrates the pre- and post-BMI scores of students in the At Risk and Obese category for the treatment group. Chart Two illustrates the pre- and post-BMI scores of students in the At Risk and Obese category for the comparison group.

The largest change in BMI score for all students was in the treatment group. One individual lowered her BMI by 2.5 points. This illustrates a decrease in BMI of 10.08 percent.

Discussion

Among the treatment group, seven students lowered their BMI scores, one student's score remained the same, and three students BMI scores increased. Because a majority of these students demonstrated a decrease in BMI scores, the extra amount of physical activity did prove to make a difference. However, the comparison group showed a greater change in BMI scores with half the amount of physical activity time. Among the comparison group, seven students lowered their BMI scores, three students remained the same, and one student's BMI score increased. In the comparison

group, there were more students who were considered overweight on the pre-test than in the treatment group. The treatment group consisted of six students in the at-risk category and five students in the overweight category. The comparison group consisted of four students in the at-risk category and seven students in the overweight category. Therefore, the amount of weight to lose plays a significant role in this study. Other factors that could have affected student's decrease in BMI were attendance, eating habits, prior fitness level, activity experience, home support, and student motivation. Another factor that could play a part in the outcome of this study is the small amount of time for the study. A healthy amount of weight loss to lower BMI should be seen over a longer period of time versus a high weight loss in a short amount of time.

Although the amount of change in this study was more evident in the students from the comparison group, there was still a noteworthy amount of change in students BMI scores, resulting in the importance of an adequate physical education program. As stated by Van Staveren & Dale (2004) schools control food choices through the cafeteria, time spent in physical activity through P.E. classes, and chances to educate and inform through health classes. Krisberg (2005) declared that a child learning about

healthy eating and exercise was as important as learning about geography.

With the overwhelming amount of research suggesting that daily physical activity and healthy eating habits reduce the risk of obesity, my study proved true. Even though my comparison group had a greater amount of BMI change than my treatment group, being physically active caused a change in BMI scores. Even though this study did not prove true to my research question: Will an increased amount of physical activity from 40 minutes to 80 minutes a week lower the BMI of students in the fifth grade at Martha Vinyard Elementary School who are at risk of being overweight or obese?, it did confirm that obesity is a consequence of a sedentary lifestyle. For some of these children PHYSICAL EDUCATION classes are the only means to physical activity they receive, which makes it so important. Children are at school a large number of days throughout the year. This makes the schools, and its educators, partially responsible for the well being of a child. Educating children about health and fitness and engaging them in physical activity are ways to empower children to feel victorious in becoming a child that continues to lead an active healthy lifestyle.

At the end of this investigation, there were a few factors that could have been done differently. The amount of time in which the study was carried out was limited and the students were not receiving physical activity every day. Students received PHYSICAL EDUCATION only once or twice per week. A different result may have been found over a longer study time frame and with more days of physical education. Once again, although the actual data did not support the research question, it is extremely important to have students in physical education as much as possible to promote healthy living and a healthy lifestyle.

Principal Acknowledgement

Sandra Johnson, Principal at Martha Vinyard Elementary, sent a letter as requested acknowledging her awareness of this project. You may reach her at 985-386-6364. See attached.

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Appendix

Table Three: Average Change in BMI Scores

Average Change in BMI Scores for Treatment and Comparison Group	
Average change in BMI scores for Treatment Group	-.473
Average change in BMI scores for Comparison Group	-.618