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Influence of Teacher Participation on Student Fitness and Student Participation in Physical Education

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Abstract

Physical activity plays a key role in the health of children. Childhood obesity is increasing in the United States, and children are spending less time being physically active. Active participation by a physical education (PE) teacher in physical activities has been suggested as a means of promoting student fitness. The purpose of this quasi-experimental quantitative study was to determine whether modeling of physical activity by a PE teacher would increase student participation and physical fitness. Bandura's social learning theory provided the theoretical framework for the study. Participants included 311 4th and 5th grade elementary students enrolled in physical education classes. One group of students experienced PE teacher modeling in physical education class activities and the other group experienced no PE teacher modeling. Participation grades in physical education were used for participation scores, while the FITNESSGRAM was used to measure student physical fitness. Independent samples *t* tests were used to compare students' fitness and participation levels between the two groups. Results indicated no significant differences in fitness or participation between the groups based on teacher modeling. This study promoted positive social change by providing initial research findings to the local site on encouraging physical activity through teacher participation, which may be used to further examine student participation in physical activity.

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Section 1: Introduction to the Study

Childhood obesity is becoming a serious concern for U.S. youth (Griffiths, Gately, Marchant, & Cooke, 2013). An estimated 13.9% of 2 to 5 year olds, 18.8% of 6 to 11 year olds, and 17.4% of 12 to 18 year old children in the United States are considered overweight (Daniels, Jacobson, McCrindle, Eckel, & Sanner, 2009). According to Ogden and Carroll (2010), 16.9% of children between the ages of 2 and 19 years are considered obese, which equals roughly more than 12 million children in the United States (F as in Fat, 2010). The Centers for Disease Control and Prevention (CDC, 2012b) stated that in 2010, no state in the country showed a prevalence of adult obesity less than 20%. If such abnormal weight gain is not managed in childhood, it leads to obesity in adulthood, which can cause serious health risks and mortality (Levy & Petty, 2008). The U.S. Department of Health and Human Services (HHS) (2010) estimated that 112,000 deaths may occur each year due to obesity. An estimated $147 billion was spent on medical costs for obesity in 2008 (Hammond & Levine, 2010). Over the past 20 years, the rising number of children who are obese has been a cause for local, national, and international focus (Bromfield, 2009). According to Bromfield (2009), obesity is being viewed as an epidemic worldwide.

According to Levy and Petty (2008), over the past 30 years, the number of U.S. children ages 6 to 11 who are considered obese has tripled while the number of preschoolers who are obese has doubled. Approximately nine million (15%) children over the age of 6 are considered obese (Levy & Petty, 2008). Childhood obesity has been linked to several health conditions in adults (e.g., hypertension, diabetes, and

cardiovascular disease). Bromfield (2009) noted that, in childhood, obesity could cause sleep disorders, asthma, and type 2 diabetes. Anderson and Phelps (2009) stated that obesity has risen to 17% in the child population. In the past 40 years, childhood obesity rates have more than tripled (Anderson & Phelps, 2009). According to Anderson and Phelps, "overweight can no longer be viewed as a *state or condition*. Obesity has emerged as a *recalcitrant eco-biopsychosocial interaction*" (p. 750). In other words, obesity is affecting the biological, psychological, and social aspects of a person's life.

The number of overweight and obese children in the United States is also a serious concern for the state of Georgia. Georgia ranks 17th nationally for the number of obese children (Georgia Department of Public Health, 2013). According to Powell et al. (2009), 52% of fifth and seventh grade students in Georgia did not meet the standards for aerobic capacity while 30% were not in the healthy range for BMI. The rural county in Northeast Georgia in which this study took place had an obesity rate of 28.9% in 2011 (CDC, 2014). In 2016, there was a diabetes rate of 13% and an inactive, or no exercise, rate of 29% (The University of Georgia, 2016). There was also a low-income preschool obesity rate of 19.7% (City-Data, 2013).

In Georgia, students in grades kindergarten through fifth are required to take 90 hours of physical education (PE) (National Association of State Boards of Education [NASBE], 2013). PE must be made available for middle school students, and high schools students must take one health and PE course to graduate. This means that elementary school is, largely, the only time students are involved in PE. In the county used in this study, there was a reported 3.8% of students in Grades 1 through 8 and 3.5%

of students in Grades 9 through 12 enrolled in a private school (City-Data, 2013). Therefore, a vast majority of the students are enrolled in a public school and are only required to take PE in elementary school and once in high school (NASBE, 2013).

Although much research has been conducted on childhood obesity, very little has linked it to PE. It has been demonstrated that physical activity has a positive impact on a person's health (Barton, 2012), but little research has shown that PE has the same outcome. Even less research has been conducted on teacher participation in PE. It has been recommended for PE teachers to act as health role models for their students (National Association of Sport and Physical Education [NASPE], 2011), but little has been written about participating in class, and what has been reported is contradictory. For example, Sather (2009) stated that teachers should not participate in class due to the lack of supervision of students, lack of ability to provide feedback, and the increased danger of injuring a student. However, Rink, Hall, and Williams (2010) argued that PE teachers should lead by example, including participating in class.

Children need to be active to decrease their chance of becoming overweight or obese. Barton (2012) found that children who are inactive are more likely to be obese. Physical education class, for some, may be the only place students are active in their lives. Being active can help students develop motor skills and physical fitness (NASPE, 2001). Although much research has been conducted on childhood obesity, very little has linked it to PE.

Physical activity has a positive impact on a person's health, but little research has shown that PE has the same outcome. Even less research has been conducted on teacher

participation in PE. Some researchers have argued that physical educators should act as health role models for students, but little is known about the influence on student participation in class, and what has been reported is conflicting. This study was conducted to fill the gap in the current research by examining the influence of teacher participation in PE on students' health and students' participation in PE.

Problem Statement

Childhood obesity is a national problem and is on the rise. Karnik and Kanekar (2012) estimated that nearly 20% of U.S. children are overweight or obese. Being obese causes health problems for children and adults, as well as increases in health care costs (Trasande & Chatterjee, 2012). This needs to be addressed at a state and local level (Pelone et al., 2011). PE provides a great tool to get children to be physically active (Vale, Santos, Soares-Miranda, Silva, & Mota, 2011). However, research on the optimal role of PE teachers in promoting physical activity has not been conclusive. Active participation by PE teachers in physical activities has been suggested as a means of promoting student fitness, but research is needed on the impact of this teaching method on student participation and physical fitness.

Research Questions and Hypotheses

This study addressed the following research questions (RQs) and hypotheses. Directional hypotheses were tested for each research question.

RQ1: What is the effect of teacher participation in physical education on student participation?

H_o1: Higher levels of student participation in physical activity as measured by participation grades are not observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

H_a1: Higher levels of student participation in physical activity as measured by participation grades are observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

RQ2: What is the effect of teacher participation in physical education and students' fitness?

H_o2: Greater pre-to-post increases in levels of student fitness as measured by the FITNESSGRAM are not observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

H_a2: Greater pre-to-post increases in levels of student fitness as measured by the FITNESSGRAM are observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

Purpose of the Study

The purpose of this quasi-experimental study was to determine whether, as predicted by the theory of observational learning, modeling of physical activity by a PE teacher increases the participation of students in PE class and increases their physical

fitness. The dependent variable was teacher participation in physical education class activities. The independent variables were student participation in physical activities during PE, as measured by participation grades, and students' health, as measured by the FITNESSGRAM.

Theoretical Framework

Observational learning theory, or social learning theory, provided the framework for this study. Bandura (1971) proposed that people learn new behaviors by watching or observing other people's behaviors. These behaviors are then followed by a good or bad consequence. When a behavior has had a good consequence, it is more likely to be repeated. Bandura (1971) stated

> when novel forms of behavior can be conveyed only by social cues, modeling is an indispensable aspect of learning. Even in instances where it is possible to establish new response patterns through other means, the process of acquisition can be considerably shortened by providing appropriate models. Under most circumstances, a good example is therefore a much better teacher than the consequences of unguided actions. (p. 5)

When behavior is based on a person's ordeals, it is based on the rewards and consequences of the person's actions.

Bandura (1971) stated that behaviors are often unknowingly performed based on consequences, and therefore the affiliation between the activity and the aftermath is never really known. There are also consequences and rewards that are known, and past doings can motivate behavior based on these outcomes. According to Bandura, because of prior

experiences, people know what to expect. For example, some actions will give desirable outcomes while other actions will give undesirable outcomes. Therefore, actions are regulated by the outcomes people expect from their actions (Bandura, 1971).

The second part of observational learning theory is learning through observation of others (Bandura, 1971). Behaviors may be learned intentionally or unintentionally. Imitative learning occurs when there is a motivation given to encourage the observer to imitate the behavior (Miller & Dollard, 1941). Positive reinforcement is the driving force behind this process. Skinner (1953) introduced the operant conditioning analysis for modeling. This is composed of three parts: cue, response, and reinforcement. There is no motivational portion (Skinner, 1953). Skinner, like Miller and Dollard (1941), tried to show how imitated behavior is based on reinforcement; however, it is not truly defined by observation.

Bandura (1971) stated that four processes drive observational learning theory. The first process is attention. According to Bandura, attention is what draws a person to learn by observation. Attention is also what keeps the person repeating the action, as in rewarding experiences. Retention is the second process Bandura discussed. Observing and learning from a behavior serves no major purpose if the behavior cannot be retained long term. The third process is motor reproduction. Bandura stated that it is not enough to be able to observe and retain what has been observed; it must be reproduced, as well. What was observed must be reproduced and practiced to be considered modeling. The fourth and final process is reinforcement and motivation. This is the driving force behind observational learning theory.

According to Bandura (1971), observing others and direct experience can influence a person's behavior. In my study, student participation could be influenced by teacher participation in PE. If students observe the PE teacher being physically active during class, it could motivate them to do the same. Bandura also stated that "most behaviors that people display are learned, either deliberately or inadvertently, through the influence of example" (p. 5). Through leading by example, PE teachers may motivate students to participate in physical activities during class. If the students participate in physical activity, it can lead to health benefits. Therefore, it could be said that teacher participation in physical activity during PE could have an impact on students' health.

Definitions

Body mass index (BMI): BMI is a tool used to determine whether a person is overweight or obese. It is calculated using height and weight. BMI for children is calculated differently than it is for adults. An age appropriate and sex specific percentile is used for children (CDC, 2012a).

Childhood obesity: Having a BMI at or above the 95th percentile for children of a certain age and sex (CDC, 2012a).

Epidemic: Sudden, widespread occurrence of a particular undesirable phenomenon (Oxford Dictionary, 2012).

FITNESSGRAM: Fitness assessment and reporting programs for youth. FITNESSGRAM includes a variety of tests to assess aerobic capacity, muscular strength and endurance, flexibility, and body composition. Scores from the tests are compared to healthy fitness zone standards. The FITNESSGRAM is used to determine students'

overall physical fitness. It is also used to identify areas that need improvement (FITNESSGRAM, 2012).

Physical activity: Bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above a basal level (CDC, 2011b).

Physical education: Instruction in the development and care of the body ranging from simple callisthenic exercises to a course of study providing training in hygiene, gymnastics, and the performance and management of athletic games (Merriam-Webster, 2012).

Physical fitness: The ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure time pursuits. Physical fitness includes aerobic power, muscle endurance, strength and power, flexibility, body composition, balance, speed, and reaction time (CDC, 2011b).

Overweight: Having a BMI at or above the 85th percentile, but below the 95th percentile in children for a specific age and sex (CDC, 2012a).

Assumptions, Limitations, Scope, and Delimitations

Assumptions

I assumed that the two schools examined were equivalent in terms of demographic characteristics. I also assumed that the two schools were equivalent in the level of physical activity in the PE classes. In addition, I assumed that the PE teachers were using the same criteria for assessing classroom participation. Lastly, I assumed that the PE teachers were monitoring and assessing the FITNESSGRAM in the same manner.

Limitations

One limitation was that random assignment to condition was not possible. The sample consisted of students enrolled in PE, and therefore participants could not be chosen randomly. Because preexisting differences between the two schools could not be ruled out, I conducted a pre- and posttest of the FITNESSGRAM. If pretest scores obtained for both schools did not differ, but significantly higher posttest levels of participation and fitness were observed in the teacher participation school, the possibility that the findings were attributable to preexisting differences could be ruled out. One final limitation was the inability to control for confounding variables, such as environment and behaviors.

Scope

The study included fourth and fifth grade students enrolled in a PE class. The study took place at two rural elementary schools over a nine month period with a sample size of 132 students in the no-participation condition and 179 students in the participation condition. This made the total number of students 311. Independent variables were student participation and student health, and the dependent variable was teacher participation.

Delimitations

The boundaries for the study were two rural elementary schools in Northeast Georgia. The age of the students ranged from 5 to 12. The total number of students was 1,051 between the two schools.

Significance of Study

In 2007, the adult obesity rate for the rural county in Northeast Georgia, where this study took place, was 25.9% (Georgia Department of Community Health, 2010). According to the Helping Hands Outreach, a nonprofit organization in Georgia (as cited in Georgia Department of Community Health, 2010), diabetes, stroke, heart disease, and high blood pressure can all be caused by childhood obesity. Additionally, 25% of children under the age of 10 have been diagnosed with high blood pressure or high cholesterol (Georgia Department of Community Health, 2010).

Helping Hands Outreach (2010) focused on helping low income families receive health care and education. Helping Hands Outreach reported that, in 1968, 80% of children played sports daily. Today that number is 20% (Helping Hands Outreach, 2010). According to the CDC (2011a), children are not getting the recommended amount of daily physical activity (60 minutes). One reason for this may be that only 26.1% of students in Grades 9 to 12 in Georgia are physically active, meaning they exercise regularly (CDC, 2010b), and only 30.3% of high school students attend daily physical education classes (CDC, 2010a).

Childhood obesity is a national and local epidemic. The rate at which the percentage of children who are obese is rising is alarming. According to Helping Hands Outreach (2010), 15.5% of adolescents and 15.3% of children are obese, and childhood obesity rates have tripled in the last 40 years. Along with the increasing number of children who are obese is an increasing number of children with health issues. Li and Hooker (2010) reported that childhood obesity is linked to obesity in adulthood. Heart

disease and type 2 diabetes are being diagnosed in overweight and obese children (Li & Hooker, 2010). According to Shaya, Flores, Gbarayor, and Wang (2008), childhood obesity is the leading cause of pediatric hypertension. It is also a cause of orthopedic problems and stress of weight bearing joints (Shaya et al., 2008). Not only does childhood obesity affect physical health, it can affect a child's psychosocial and psychological health by contributing to low self esteem, peer rejection, and discrimination (Shaya et al., 2008).

Over the past 20 years, hospital costs for diseases or conditions related to childhood obesity have dramatically risen (Shaya et al., 2008). Childhood obesity is a strain on social and economic development (Li & Hooker, 2010). According to Li and Hooker (2010), the cost of childhood obesity in 2003 was approximately $139 billion. With childhood obesity being a cause for concern socially and economically, change needs to take place to help the children and thereby help the economy. Physical activity plays a big role in the prevention of childhood obesity (NASPE, 2001).

With childhood obesity on the rise, physical activity in children needs to increase. The CDC (2011a) recommended 60 minutes of physical activity each day for children and adolescents. However, the American Cancer Society (ACS), American Diabetes Association (ADA), and American Heart Association (AHA) (2008) recommended only 30 minutes of physical activity every day. PE is a required part of a child's education, but is not always a daily requirement (NASPE, 2010). If children are being inactive outside of school and at home, school may be the only place they are physically active. According to NASPE (2001), PE is important in "educating the whole student" (p. 1).

NASPE stated that children who engage in physical activity daily have better physical fitness, better performance in school, and better attitudes about going to school.

However, just because students are involved in a PE class does not necessarily mean that they are being physically active or meeting the recommended 60 minutes per day. PE teachers have to find a way to motivate students and get them interested in becoming physically active. One way to do this may be through teacher participation. According to Rink et al. (2010), teachers should lead by example. Rink et al. explained that a PE teacher could be a positive influence by being physically fit and physically active. By making the most of physical activity during PE, the PE teacher can be a big influence on the physical activity levels of students. If children are being more physically active, their health will benefit. According to NASPE (2001), benefits from physical activity include disease prevention, a better quality of life, increased mental health, and a decrease in mortality.

If students can be more engaged in physical activity, it can possibly help to decrease childhood obesity rates. PE is a great tool to engage students in physical activity. If teacher participation can increase student participation, perhaps more children will enjoy physical activity inside and outside of school. This can contribute to positive social change by having an impact on childhood obesity and the community.

Summary

Childhood obesity is on the rise in the United States (Daniels et al., 2009). To combat childhood obesity, lifestyle changes must be made, including increasing physical education (Steglin, 2008). Due to the fact that children spend over half their day at

school, this may be the best chance at fighting childhood obesity (Torre, Akrè, & Suris, 2010). Physical education plays a key role in the battle against childhood obesity (Green & Reese, 2007).

According to NASPE (2001), PE gives children a chance to develop motor skills and learn lifelong skills to develop healthy lifestyles. The CDC (2011a) recommended 60 minutes of physical activity every day for children. PE can be a great tool but does not automatically ensure that students are meeting the 60 minutes of recommended physical activity. PE teachers must get students motivated to participate. One way to do this is by leading by example and participating in class. In Section 2, I review the literature pertaining to obesity, teacher participation, and observational learning theory.

Section 2: Literature Review

This section includes a review of literature on obesity and childhood obesity. I also address the effects of physical activity, physical education, and teacher participation on childhood obesity. In addition, I explain how observational learning theory relates to this study, and provide a review of fitness testing and grading in physical education. Key terms used to identify pertinent studies included *obesity*, *childhood obesity*, *physical activity*, *physical education*, *teacher participation*, *teachers as role models*, and *observational learning theory*. The information for this literature review was found using the Walden University library databases, as well as local college libraries.

Obesity

The World Health Organization (WHO) (2013) defined overweight and obesity as a larger than normal amount of fat that can be harmful to a person's health. The WHO, like many other organizations, used BMI to classify someone as overweight; a BMI greater than 30 is considered obese. The BMI calculations are the same for male and female adults. According to the WHO, the cause of obesity is consuming too many calories without spending the calories consumed. People are consuming food high in fat and doing less physical activity to burn the calories taken in with the foods.

Obesity can lead to many health problems, including cardiovascular disease, diabetes, arthritis, and some cancers (WHO, 2013). The WHO (2013) estimated that obesity has doubled worldwide in the past 20 years. In 2008, 200 million men and 300 million women were considered obese (WHO, 2013). Obesity is the fifth leading cause of

death worldwide (WHO, 2103). Even with these risk factors for diseases and death, obesity can be prevented with diet and exercise.

During the 1960s and 1970s, obesity rates changed very little, but rose from 13.4% in 1980 to 34.3% in almost 30 years (HHS, 2010). Obesity is linked to an estimated 112,000 deaths per year, and has been linked to high blood pressure, sleep apnea, stroke, and gallbladder disease. The non-Hispanic Black and Hispanic populations have a higher obesity rate than the non-Hispanic White population. Obesity is also more prevalent in people with mental illnesses (HHS, 2010).

According to the HHS (2010), poor diet and lack of exercise are not the only factors contributing to obesity. Genes, environment, and metabolism are also contributing factors. The keys to combatting obesity include changes in diet, exercise, and behavior. Increasing physical activity can lower the chance of obesity and related diseases (HHS, 2010). Educating children early about diet and physical activity may help to prevent obesity, and the diseases related to it, later in life.

The obesity epidemic is not only affecting the health of the nation, but the economy as well. Because obesity is linked to diabetes, heart disease, and more, the medical spending on these conditions has risen with the levels of obesity (Hammond & Levine, 2010). Thompson, Edelsberg, Colditz, Bird, and Oster (1999) observed the relationship between obesity and the following five diseases: high blood pressure, high cholesterol, diabetes, coronary heart disease, and stroke. Thompson et al. estimated the future risks of the five diseases, the life expectancy, and the medical costs associated with obesity and the five diseases. Men and women ages 35 to 64 were classified based on

their BMI as healthy, overweight, obese, and severely obese. Thompson et al. found that the risk of high blood pressure was two times higher for the obese participants as it was for the healthy participants. Thompson et al. also found that the risk of coronary heart disease over a lifetime was 6.9% higher in obese men and 7.4% higher in obese women.

Gorsky, Pamuk, Williamson, Shaffer, and Koplan (1996) performed hypothetical cohorts of 30,000 women. This means that a cohort was not actually performed, but in theory, these women could have participated. Three cohorts were hypothetically performed, including obese, overweight, and healthy weight. The cohorts included women at age 40. Gorsky et al. estimated the medical costs of the women being obese for 25 years. Gorsky et al. found that the obese women would have medical costs of approximately $53 million, while the overweight women's medical costs would be approximately $22 million. Gorsky et al. used these figures to estimate the national medical costs from 1996 to 2021 to be $16 billion.

Children are also contributing to the obesity related medical costs for the United States. Medical care directly related to childhood obesity costs the United States approximately $14.3 billion per year (Hammond & Levine, 2010). Lightwood et al. (2009) estimated that from 2020 to 2050, obese adults ages 35 to 64 will incur an estimated $54 billion in medical care.

Childhood Obesity

Obesity is a global concern for all age groups, but the rise in the number of children who are obese has caused global concern (Bromfield, 2009). In the United States, childhood obesity rates have risen greatly in the past 33 years (WHO, 2013).

Commonly diagnosed between the ages of 5 to 6 years, the American Academy of Child and Adolescent Psychiatry (AACAP) (2016) estimated that 16% to 33% of children and young teens are obese. This percentage has nearly tripled since 1963. The number of 6 to 11 year olds suffering from childhood obesity has doubled in the past two decades (Li & Hooker, 2010). The percentage of 12 to 19 year olds who are obese has tripled in that same amount of time (Li & Hooker, 2010).

Obesity in children and adolescents has increased internationally. In the United States, girls have been more affected than boys (Deckelbaum & Williams, 2001). For example, Deckelbaum and Williams (2001) found that in a period of over 20 years, the number of obese girls doubled while the number of obese boys increased by less than 25%. Deckelbaum and Williams also found that Mexican-American boys and girls tend to be more overweight, while non-Hispanic White children had the lowest percentage. In addition to sex and ethnicity, socioeconomic status was related to overweight and obese children due to possible interactions between genes and nutrients (Deckelbaum & Williams, 2001).

Mississippi is the most problematic state in the nation, with a childhood obesity rate of 21.7% (Levi, Rayburn, Segal, & Martin, 2015). South Carolina follows closely with a childhood obesity rate of 21.7% (Levi et al., 2015). The Southern United States is considered the most severe region with 7 out of the top 10 states for childhood obesity (Levi et al., 2015).

In 2003, Georgia was the 26th most obese state for childhood obesity, and 23rd in 2005 (KIDSCOUNT, 2006). According to the Georgia Department of Human Resources

(2005), the percentage of obese children aged 2 to 5 has risen 5% in 9 years. Obesity in Georgia is more prevalent in African American males ages 11 to 14 years (Georgia Department of Human Resources, 2005).

The county in which this study took place has an obesity rate of 27.5% (FindtheBest, 2013). This county also has a physical inactivity rate of 25.3%, as well as a diabetes rate of 10% (FindtheBest, 2013). According to the National Initiative for Children's Healthcare Quality (2010), the percentage of low income preschool children who are obese is 19.7%. The county ranks 13th in the state for obesity (National Initiative for Children's Healthcare Quality, 2010).

According to the AACAP (2016), if a child has a parent who is obese, the child has a 50% chance of also being obese. The chance of the child being obese increases to 80% if both parents are obese (AACAP, 2016). Childhood obesity can be linked to many things, including overeating, little to no exercise, family history, and depression (AACAP, 2016). Moreover, children who are obese have a 70% chance of being obese as an adult, and an 80% chance if one or more parent is obese (Bishop, Middendorf, Babin, & Tilson, 2005). The AACAP (2016) stated that "obesity is among the easiest medical conditions to recognize but most difficult to treat" (para. 1). Managing childhood obesity can be accomplished through a variety of options, including changing eating patterns and increasing exercise (AACAP, 2016).

Lifestyle and environment seem to be the two major causes of childhood obesity (Dehghan, Akhtar-Danesh, & Merchant, 2005). According to Dehghan et al. (2005), food has become more of a low cost convenience and pleasure rather than a source of

nourishment. Dehghan et al. stated that it would take a large amount of vigorous physical activity to counteract a small amount of unhealthy, low nutrient food. A decrease in physical activity can be linked to an increase in childhood obesity. Dehghan et al. found that parents sometimes support an inactive lifestyle for their children. Furthermore, this may be why children who are overweight, with overweight parents, will become overweight adults (Dehghan et al., 2005).

Gollust, Niederdeppe, and Barry (2013) explored how the general public viewed obesity prevention. Gollust et al. stated that, traditionally, Americans viewed obesity as a personal problem, not a government problem. Therefore, the responsibility for reducing childhood obesity falls on the parents, not the schools or food and drink companies (Gollust et al., 2013). Gollust et al. used a control group and a treatment group for their study. Gollust et al. showed the groups messages about the consequences of obesity and then compared the attitudes that the groups had toward the messages. Gollust et al. found that the group's attitudes supported government intervention, due to the costs of health care related to childhood obesity.

Wang and Lim (2012) studied the current prevalence of childhood obesity, as well as the trends over time. Wang and Lim estimated that 1 in 10 North American children ages 5 to 17 were overweight or obese. In 2006, 28% were considered overweight and 10% obese (Wang & Lim, 2012). In 2009, 31.8% were overweight while 16.9% were obese (Wang & Lim, 2012). These statistics were from the United States alone. Childhood obesity rates are rising worldwide, as well.

Wang and Lim (2012) estimated that obesity is responsible for 10% to 13% of deaths in parts of Europe. By 2030, Wang and Lim projected the deaths to reach 17% in the United States. The childhood obesity rate increased globally from 4.2% to 6.7% between 1990 and 2010 (Wang & Lim, 2012). Wang and Lim estimated that the global rate could reach 8.6% by 2020. Because of this, Wang and Lim stated that childhood obesity needed to be seen as high priority in national prevention programs.

Richards et al. (2013) described the need for change in childhood obesity. Richards et al. stated that the annual cost for medical care associated with childhood obesity in the United States is over $147 billion, with over $470 million of this being in Hawaii alone. Richards et al. stated that although Hawaii is considered to be one of the healthier states, it still has a childhood obesity rate of 13.4%. Although Hawaii has somewhat lower childhood obesity rates than other states, Richards et al. argued there was a need for government intervention to encourage change. The Childhood Obesity Prevention Task Force was created on July 6, 2012 (Richards et al., 2013). The task force focused on four areas to affect change: education, community, business, and health care. The ultimate goal of this task force was to make healthy living a normal way for the people of Hawaii to live their lives by incorporating changes to every day routines (Richards et al., 2013).

Childhood obesity is a worldwide epidemic with the United States having a rate of 18% compared to 20% to 30% in European countries (Flynn, 2013). Between 1990 and 2010, the global obesity rate rose by 2.5% to reach 6.7% and is expected to reach 9% by 2020 (Flynn, 2013). Childhood obesity can cause health issues, including type 2

diabetes and hypertension. Flynn (2013) studied hypertension rates in children over time. Flynn found that from 1974 to 2012, the percentage of children with hypertension was 2% to 3.5%. More recently, the rates have been 4% to 5% (Flynn, 2013). The increase, according to Flynn, is due to the increase in childhood obesity. Flynn predicted that as obesity rates increase, early onset adult cardiovascular disease would begin to increase, as well.

Pelone et al. (2011) stated that childhood obesity is a challenge of the twenty-first century. Not only does childhood obesity have an impact on health, it has an impact on economics, as well. Pelone et al. described direct economic consequences as medical costs. Indirect consequences are absenteeism to work or school. In the United States, health care costs related to obesity and its related diseases reached approximately $147 billion in 2008 (Pelone et al., 2011).

Severe obesity rates in children ages 2 to 19 have risen more than 300% in the United States (Flores & Lin, 2013). Flores and Lin (2013) defined severe obesity as having a BMI of over the 99th percentile for a person's age and sex. Severe obesity was linked to high cholesterol, high blood pressure, and abnormal glucose levels (Flores & Lin, 2013). Flores and Lin reported that severely obese children had a greater chance of being absent from school than normal weight children. Absenteeism rates were reported as being as high as 11% greater (Flores & Lin, 2013).

Obesity in children can lead to diabetes, high blood pressure, and trouble sleeping (Daniels, 2006). Emotional problems may also occur, including low self esteem, anxiety, obsessive compulsive disorder, and depression (AACAP, 2016). Adolescents who are

considered obese were found to be more likely to have suicidal thoughts than those of a normal weight, and 13.3% of obese teens were found to have had suicidal thoughts (Royal College of Psychiatrists, 2008).

According to Herouvi, Karanasios, Karayianni, and Karavanaki (2013), adolescence is a very important time when obesity can develop. Herouvi et al. stated that this is due to the regulation of sex steroids during puberty. Childhood obesity is linked to many cardiovascular diseases that can carry over into adulthood. These may include hypertension, type 2 diabetes, and atherosclerosis. Herouvi et al. stated that 37% of children who are hypertensive, or have high blood pressure, are obese. Because these diseases can persist into adulthood, Herouvi et al. suggested interventions for a lifetime, including diet, physical activity, and weight control starting as early as adolescence.

Childhood obesity can cause immediate and delayed consequences. Immediate consequences may be physical (gallstones, sleep apnea, hepatitis) or psychological (teasing, discrimination) (Must & Strauss, 1999). Obesity in children can cause orthopedic, neurological, and other bodily diseases and issues. Blount's disease, or bowing of the legs, can occur due to excessive weight gain in children (Must & Strauss, 1999). Must and Strauss (1999) found that most gallstone cases in children that are not linked to another medical condition are caused by childhood obesity. It has been observed that females who are obese before 10 years of age experience menarche early. However, some obese females may experience late or absent menarche, along with insulin resistance and acne (Must & Strauss, 1999). Must and Strauss have found that children who are overweight have been described as "lazy, lying, cheating, sloppy, dirty, ugly, and

stupid" (1999, p. 4). Furthermore, Must and Strauss found that children with low self esteem tend to have lower academic achievement. However, it has also been found that there is a correlation between physical activity and health benefits, physically and mentally, including increased academic performance (Kohl and Cook, 2013).

Effects of Physical Activity and Physical Education

According to the ACS, the ADA, and the AHA (2008), PE should be an important part of students' daily lives (2008). A PE program can help prevent the epidemic of childhood obesity (American Cancer Society, 2008). The ACS, ADA, and AHA recommended that children spend at least 30 minutes of everyday in physical activity. Because children spend over half of their day in school, the ACS, ADA, and AHA believed it is reasonable to require the school to provide the children with these 30 minutes. However, according to the ACS, ADA, and AHA, only 3.8% of elementary, 7.9% of middle, and 2.1% of high schools provide PE classes daily. To help combat this, the ACS, ADA, and AHA believed legislation should consider requiring all school districts to develop a PE curriculum for K through 12, assure PE programs have adequate equipment, make sure students are meeting the recommended amount of physical activity time, and require PE to graduate.

Torre et al. (2010) stated that to have an impact on childhood obesity, schools needed to be involved because schools come in contact with so many children for long periods of time. According to Torre et al., schools should make sure school food is nutritional, have students participate in 30 minutes of activity daily, promote after school activities, and involve school health services to prevent obesity. However, school can

encounter barriers to these recommendations. These barriers are structure constraints and stakeholder views. Stakeholders can include parents, students, vendors, et cetera. Torre et al. studied stakeholders in Swiss schools about their perceptions of these recommendations.

Qualitative research, primarily focus groups, was used to study the perceptions of stakeholders (Torre et al., 2010). The stakeholders were comprised of school directors, PE teachers, caterers, nurses, parents, and adolescents. The focus groups discussed strategies on promoting healthy eating, physical activity, and obesity prevention. Torre et al. (2010) found that there was a strong desire for obesity prevention in the schools.

Shaya et al. (2008) studied the school-based interventions on childhood obesity. These interventions had been focused on dietary guidelines of meals and increasing physical activity. These interventions varied from school to school. Shaya et al. conducted a literature review based on the length, type, and outcome of the interventions. The primary purpose for the research was to offer suggestions for future school-based interventions.

The result of this research found that most of the schools using physical activity geared toward decreasing obesity had high success rates (Shaya et al., 2008). However, there were economic limitations to the long term success of these programs. Budget cuts often called for the decrease of PE and after school physical activity programs. Shaya et al. (2008) also found that educating about dietary guidelines had positive short term rewards. Even so, economic problems may cause schools to have the less expensive unhealthy foods over the healthier foods for their menus. Shaya et al.'s results found that

these short term interventions were not enough to successfully have a school-based intervention program to combat obesity. More long term interventions were needed to make a difference.

Schools can be an ideal place to address healthy living with children because they spend most of their time at school (Shofan, Kedar, Branski, Berry, & Wilschanski, 2011). Shofan et al. (2011) designed a school-based intervention program to help prevent childhood obesity. The program consisted of increased PE and physical activity, as well as advice on healthy eating habits. Shofan et al. studied children, ages 9 to 11, who received nutrition advice and double PE weekly for two years. These children were compared to a group of children, the same age, which received the normal PE time weekly with no nutritional advice. Shofan et al. found that the boys in the control group not receiving the extra PE gained excessively more weight than the experimental group. There was no significant change for the girls. Therefore, Shofan et al. believed increases in physical activity at school could help to decrease childhood obesity.

Janssen (2014) described childhood obesity intervention as being insufficient thus far, and believed this is due to an inadequate amount of physical activity. According to Janssen, children should be involved in active play (child led games and activities) rather than strictly physical activity. Janssen felt that since active play is where most children get their exercise, it should be considered as a tool in the childhood obesity interventions. Janssen studied the number of calories an average Canadian child would expend doing the following physical activities: organized sports, PE, and active play. Janssen found that active play expended the most calories per day. In parts of Canada, PE is not required

daily, and organized sports had a lot of sedentary time. Janssen believed active play could be a great tool for decreasing childhood obesity rates and needs to be incorporated in and out of schools.

According to Barton (2012), exercise is one of the key components to combating obesity. The health benefits associated with physical activity are numerous. These benefits include lower blood pressure and lower fatty tissues. A lack of exercise has even been linked to premature aging (Barton, 2012). Barton stated that physical activity needed to be a part of a child's daily life in order to prevent childhood obesity. Prevention falls into the hands of parents, schools, governments, and health professionals.

Guinhouya (2012) stated that physical activity has many positive effects on health, including reducing childhood obesity. Physical activity is comprised of many things, including fidgeting to playing, and can be performed in many ways, such as sports, PE, exercise, and gardening. According to Guinhouya, childhood is the time when most physical activity occurs and starts to decline during adolescence. Guinhouya stated that it is important to continue the physical activity through this time as adipose tissue levels can rise during puberty. Guinhouya also found that role modeling played a part in whether children stayed active. Children that had physically active parents were six times more likely to engage in physical activity than those children who had inactive parents (Guinhouya, 2012). One other factor Guinhouya found that kept children active was enjoyment. If children enjoyed the activity, and felt like they were good at it, they were more likely to continue being physically active (Guinhouya, 2012).

Inactivity can be linked to health related diseases in youth and adulthood (Vale et al., 2011). Vale et al. (2011) noted that preschool aged children typically had low physical activity levels. Controlling the physical activity levels at such a young age, according to Vale et al., could play an important part in the health of their adulthood. Vale et al. studied the physical activity levels of preschool aged children, including kindergarteners, and compared the activity levels on days of PE to days without PE. During the PE days, the children's physical activity levels were significantly higher. Vale et al. suggested the need for PE as a means to provide physical activity, even for as young as preschoolers.

Preventing diseases at an early age is important. According to Timpka, Petersson, Rylance, Kedza, and Englund (2012), PE is a primary place for prevention. Not only can PE help in school to combat diseases, but it can also carry over outside of school in ways such as involvement in sports throughout adolescence. Timpka et al. (2012) was interested not only in how PE could affect a child's health, but how it could affect an adult years later. Timpka et al. performed a cohort study that lasted for more than thirty years. The subjects of the study were students who graduated, in Sweden, from 1974 to 1976 with a grade in PE. Along with their PE grade, Timpka et al. reviewed three of their health impairments between the years of 2003 to 2007: number of times student visited physician, number of times student was in hospital, and number of times student was absent from work due to sickness. Timpka et al. found that the female students with a low grade in PE visited their physician more and had more days out of work due to sickness. No real patterns were found for the male students. Timpka et al. stated that, due to the

findings, early prevention is needed, like PE, to start combating diseases before adulthood.

Only 3.8% of elementary schools in the U.S. provide daily PE for students (Green, Riley, & Hargrove, 2012). According to Green et al. (2012), school can be a primary force in preventing childhood obesity. School wide programs need to be established that include PE teachers, administrators, nurses, counselors, and classroom teachers. Green et al. stated that the programs should focus on exercise classes, nutrition, and counseling. A main focus point in the program was daily PE to increase physical activity for all students. Green et al. stated that teaching children to maintain their health by engaging in physical activity is as important as literacy. Cutting PE to improve test scores will only add to the epidemic (Green et al., 2012).

Although the United States, as a whole, values being thin, being physically attractive, and being athletic (Steglin, 2008), this is also a time when childhood obesity is on the rise. Steglin (2008) suggested that schools and families are the two most important factors in combating this disease. According to Steglin, schools come into contact with millions of children daily, so they could be a huge help in combating childhood obesity. Many children eat their meals at school, and spend most of their time at school, making most of their time awake spent away from home. Teachers and families must work as a team to help prevent obesity in the children.

There are three areas, according to Steglin (2008), that the schools and families should be focusing on: (1) nutrition, (2) physical activity, and (3) psychological support. Healthy meals should be served and the families should be educated about the food being

served. Physical activity needs to be increased daily for the students. Finally, psychological needs need to be met in order to address depression and low self esteem that can go along with childhood obesity (Steglin, 2008). Schools and homes must work together.

PHIT America (2013), a not for profit educational campaign, stated that children are 50% more likely to be sedentary at home if they do not have PE, and two to three times more likely to be active at home and in sports if they have PE at school. According to PHIT America, an estimated 48% of all U.S. high schools do not provide PE. PHIT America related students in PE and their activity at home to a child learning to read. For example, a child not only reads at school, but at home as well. The motor skills and physical play taught at school can be taken home and applied to lifelong activities (PHIT America, 2013). PHIT America believed that parents, teachers, and administrators should work together to make sure PE is a daily part of their children's lives in order to fight the obesity epidemic, the sedentary lifestyles, and the rising health care costs associated with each.

Gordon-Larsen, McMurray, and Popkin (2000) stated that the U.S. adolescents have a serious problem: overweight and obesity. This is even truer for minority groups due to the fact that they have higher inactivity levels and lower physical activity levels; even more so for female minorities (Gordon-Larsen et al., 2000). Gordon-Larsen et al. investigated the patterns of physical activity and inactivity in U.S. adolescents based on environmental and sociodemographic factors. A questionnaire was used to determine hours of inactivity and hours spent per week engaging in moderate to vigorous physical

activity, including PE. Moderate to vigorous physical activity is defined as five to eight metabolic equivalents (METs) (Gordon-Larsen et al., 2000). Higher intensity activities, such as skating, dancing, and sports, would be considered moderate to vigorous physical activity.

The adolescents who participated in PE had a higher chance of engaging in moderate to vigorous physical activity (Gordon-Larsen et al., 2000). However, high levels of inactivity were not found to be linked to inactivity. Gordon-Larsen et al. (2000) also found that younger children had a higher frequency of PE that decreased with age and decreased even more if they were females. The highest number of inactivity and low participation in PE was made up of non-Hispanic Black and Hispanic adolescents (Gordon-Larsen et al., 2000).

Li and Hooker (2010) conducted a study that consisted of phone interviews of 12,800 randomly selected 6 to 11 and 12 to 17 year olds, asking for BMI information, as well as sex, age, language spoken, poverty level, school, and sports played. Li and Hooker found that the BMIs of children attending public schools were higher than the children attending private schools. Children with lower socioeconomic status had a larger chance of having a higher BMI (Li & Hooker, 2010). Because of the fact that public schools seem to have a higher rate of overweight adolescents, public schools need to take steps to fight this epidemic. Li and Hooker (2010) stated, "…schools as a major setting of student life need to become actively involved in developing obesity prevention programs" (p.102) and "teachers should also set a good example for children through their own diet and exercise patterns" (p. 102).

Effects of Teacher Participation

Green and Reese (2007) believed that PE plays a key role in battling childhood obesity. A quality PE program that includes nutrition and exercise is needed to reduce the number of obese children (Green & Reese, 2007). The team at the school, focusing on decreasing obesity, should also include school nurses, administration, and parents. However, the PE teacher plays the most vital role. According to Green and Reese, the PE teacher must design the class in a way in which all students will want to participate. Some examples include making sure the entire class is busy so that no students are sitting around, gearing activities toward specific abilities, and the use of a food diary (Green & Reese, 2007).

NASPE (2011) had a position statement for the code of conduct for all PE teachers, Grades P through 12, to follow. The code of conduct was made up of several core values for the profession including "nurturing students' development, collaborating with others to expand physical activity opportunities for all members of the school community, showing dedication to personal growth and to the profession, and exhibiting personal and professional integrity" (NASPE, 2011, p. 1). According to NASPE, PE teachers should provide a safe environment at all times, differentiate lessons based on ability levels of students, and use research based strategies. The PE teacher should be the exercise leader of the school by coordinating physical activity events, engaging school staff, and incorporating physical activity into the classrooms. The code of conduct also states for the PE teacher to dress in active wear that is appropriate for exercise and to "serve as role models by participating regularly in health-enhancing physical activity"

(NASPE, 2011, p.3). In a different position statement for all physical activity professionals, including PE teachers, coaches, etc., NASPE (2010) says that promoting fitness and physical activity is a key role in the profession.

Rink et al., (2010) stated that it is not feasible to believe that every child will obtain the recommended 60 minutes of physical activity every day, and even less feasible to believe that schools can offer the 60 minutes to every child every day. Rink et al. believed that this is where the PE teacher should try to provide as much physical activity time as possible when the students are in PE. The students need to be active for over half of the time in class, and learning should occur while the students are being active (Rink et al., 2010).

Not only is it important that the students be active in PE, it is important that they be active at home. Rink et al., (2010) suggested that the PE teacher teach the students activities that can be carried over into their home lives, or lifelong skills. Encouragement and motivation is also an important role in the physical educator. Rink et al. stated that physical educators need to lead by example and be a positive influence. A PE teacher should be physically active and physically fit, and use this to influence students' physical activity levels (Rink et al., 2010).

Observational Learning Theory

Parcel and Baranowski (1981) explained that health education could be influenced by social learning theory. Parcel and Baranowski stated that observation tells us what to do as well as how to do it. Videotapes and role playing can be used for demonstrations. Behaviors can be observed and learned. In health education, observational learning

theory allows for observation, practice, and performance (Parcel & Baranowski, 1981). Parcel and Baranowski also stated the importance of the model being identifiable to the observer, as well as the techniques or parts easily explained and demonstrated. According to Parcel and Baranowski, if a behavior is complicated, observation alone is probably not enough to learn it. Techniques to practice the behavior would have to be introduced. Each part of the behavior needs to be broken down, demonstrated, and explained. This way, each step can be learned before moving on to the next (Parcel & Baranowski, 1981).

Horn and Williams (2004) argued that demonstration is the most important stage of teaching a skill in PE. Horn and Williams defined this demonstrator and observer relationship as copying. The observer copies what he has seen and tries to recreate it. According to Horn and Williams, observational learning is different than copying. With observational learning, the observer takes what he has seen, copies it, recreates it, and then adapts it for lifetime behavior. For PE, it is not enough for the students to copy, but to copy and repeat across time.

Fitness Testing

There are two types of fitness tests: norm referenced and criterion referenced (Keating & Silverman, 2009). Keating and Silverman (2009) stated that, when given a choice, most PE teachers would choose a norm referenced fitness test, such as the President's Challenge. However, health organizations recommended using the criterion referenced fitness tests, such as the FITNESSGRAM. Fitness testing can serve several purposes in PE. For example, it can be used as a tool for teaching health related fitness, motivate children to be active, and as a tool for teachers and parents to view fitness

related information about students (Welk, 2008). However, a downfall could be if too much focus is placed on the outcomes. Fitness testing, according to Welk (2008), has long been the primary tool for evaluation in PE, but that assessing physical activity may actually provide more substantial data. Physical activity can be assessed through the use of heart rate monitors, pedometers, and self report instruments, such as diaries or checklists (Welk, 2008). Welk suggested using the FITNESSGRAM, which can measure and record both.

Due to the epidemic of childhood obesity, many states have started requiring a BMI screening for students (Linchey & Madsen, 2011). In fact, approximately 25% of all states have started requiring screening in schools (Linchey & Madsen, 2011) through the use of fitness assessments. Linchey and Madsen (2011) conducted phone interviews with all 50 states to determine if a school based fitness assessment, or BMI assessment, was required for each state. Linchey and Madsen found that there were several fitness tests used by the schools, including Adapted Physical Education Assessment Scale, Brockport Physical Fitness Test, FITNESSGRAM, and President's Challenge. The President's Challenge is the only assessment that does not assess BMI (Linchey & Madsen, 2011). Linchey and Madsen's interviews revealed that 20 states required BMI testing, with seven of those states requiring full fitness testing. The only test required by any state was the FITNESSGRAM. Only four states required the use of, and three states recommended the use of the FITNESSGRAM (Linchey & Madsen, 2011). All other states had a choice of which fitness test to use.

Wiersma and Sherman (2008) believed that fitness testing could be a positive tool for PE by helping to motivate students to be more physically active. For students to perform well, they must first be motivated to perform well on these tests. Wiersma and Sherman discussed three theories to motivation. Goal orientated motivation was one theory given. Some students may be motivated to perform well by competing against ranks, classes, or even personal scores from previous tests. Competences motivation, according to Wiersma and Sherman, means that mastering the activities motivates the students. The mastery of an activity serves as the reward for performing well. The final motivational theory was cognitive evaluation. Positive and negative feedback about ability can have positive and negative effects on motivation. In this regard, Wiersma and Sherman stated that results from norm referenced fitness tests might have different effects on motivation than criterion referenced tests. Wiersma and Sherman stated that fitness testing should be criterion referenced in order for results to be related to healthy standards and not related to a normative rank or percentile, as is with a norm referenced fitness test.

Lindsey et al. (2014) defined physical fitness testing as assessing at least one of the following components: muscular strength, muscular endurance, flexibility, and cardiovascular endurance. Fitness tests are considered norm referenced if they compare results to data from groups of the same age. Criterion referenced fitness tests give results based on health standards. According to Lindsey et al., the norm referenced physical fitness tests do not allow for results based on health and focuses on performance. Therefore, criterion referenced tests, such as the FITNESSGRAM, are more commonly being used (Lindsey et al., 2014).

According to Fjørtoft, Pederson, Sigmundsson, and Vereijken (2011), most physical fitness tests offered today are tailored for adults rather than children. These tests focus on muscle strength and endurance and cardiovascular endurance, with each one being tested individually. Fjørtoft et al. tested a new test battery for children's physical fitness that focused on a combination of skills, such as agility, balance, and muscular strength and endurance. The test was designed to include common child's play activities so as to make it easy to administer and as a motivational tool for the children.

Elementary school was the target population for Fjørtoft et al.'s (2011) study, including 195 children aged 5 to 12. The test battery was comprised of nine tests, all made up of jumping, running, climbing, or throwing. Some examples of the tests included throwing a tennis ball for distance, shuttle run, and standing broad jump (Fjørtoft et al., 2011). Through Fjørtoft et al.'s research, they discovered the test battery was age appropriate and difficult for every level. The test was easy to administer for small and large groups. The finding was that the results warranted further research into the new test battery, as it could be a great tool to measure physical fitness in children.

Grading in Physical Education

In PE, students are expected to be physically active. PE teachers typically assess, or grade, students on the effort they put forth in being physically active (Baghurst, 2013). Baghurst (2013) questioned this method of grading in PE, as well as a few others. Baghurst stated that some PE teachers grade on effort and participation rather than skill. This leaves the students with possibly never mastering a skill, but receiving a grade for putting forth minimal effort. Baghurst also questioned PE teachers grading on behavior

and dressing out or in correct attire. For the subject of PE to be taken seriously, the assessments of the subject itself needs to be taken seriously, and rather than grading on effort and behavior, one should grade on mastery and skill proficiency (Baghurst, 2013).

Arem (2009) suggested that assessing a class at the end of a segment is the ideal way to view any improvements in their physical abilities in PE. Competency in PE is defined as having an 80 to 85% success rate at mastering a skill (Arem, 2009). Determining beginning skill levels can be a joint task between teacher and student. As students are performing in PE, they are working towards mastering skills. At the end of a segment, the PE teacher assesses the abilities and skills to see signs of improvement, giving you pretest and posttest scores for grading (Arem, 2009).

Summary

In 1997, obesity was declared a global epidemic by the WHO (Spruijt-Metz, 2011). Now, more than a decade later, obesity rates are still on the rise. Spruijt-Metz (2011) stated that childhood obesity can carry over into adulthood, and estimated that 80% of obese 10 to 15 year olds would be obese at age 25. Obesity had been linked to many health related issues, many being life threatening. Childhood obesity increased by 10% from 2003 to 2007 in the United States alone (Singh, Siahpush, & Kogan, 2010) and has tripled over the past 30 years (Spruijt-Metz, 2011).

Physical activity can help to combat childhood obesity. It can lead to weight loss, as well as decrease blood pressure and increasing self esteem (American Academy of Pediatrics, 2006). The American Academy of Pediatrics (2006) stated that PE curriculums should include skills on how to acquire and maintain a healthy lifestyle of

behavioral skills and physical activity for a lifetime. PE could and should be used as a tool to help combat childhood obesity, but more research needs to be done to show that it can actually be useful. Specifically, research is needed that would use the FITNESSGRAM as a tool to measure the relationship teacher participation in PE can have with students' fitness, as well as using participation grades to determine if teacher participation in PE has an effect on student participation. Findings from research utilizing that methodology would be useful because the health of our children is important. For some, PE is their only chance to be physically active. If they are not participating, they are missing out on a chance to do something beneficial for their health. PE teachers need to be role models, and participating with their students is the first step. The following section is a description of the research method used in this doctoral study. It will contain sections pertaining to the setting and sample, instrumentation and material, data collection and analysis, and the measures to protect participants.

Section 3: Research Method

This research study focused on two questions. First, is there a difference in student PE participation between students of teachers who do and do not participate in the activities required of students in their classes? Second, is there a difference in student fitness between students of teachers who do and do not participate in the activities required of students in their classes? Students' health was based on the results of the FITNESSGRAM (Human Kinetics, 2012) administered in the fall of 2012 and again in the spring of 2013. A quantitative design was appropriate for answering these research questions because pretest and posttest instruments were used to test hypotheses (Creswell, 2009). Because this study addressed the effect of an independent variable (teacher participation versus no teacher preparation) on two dependent variables rather than covariation of two continuous variables, a correlational design was not appropriate (Privitera, 2013). The Walden IRB approval number for this study was 12-18-14-0150960.

The preferred means of assessing the impact of an independent variable manipulation is an experimental design (Collins, Dziak, & Li, 2009). However, in this study random assignment to conditions was not possible because preexisting groups from two schools were studied, one with a PE teacher participating in class, and one with the teacher not participating in class. When random assignment is not possible, quasi-experimental designs are recommended for assessing between-group differences (Gribbons & Herman, 1997). For this study, the type of quasi-experimental design that was most appropriate was the nonequivalent control group design. This design involves a

causal comparative (ex post facto) design that is used to assess the treatment effects on different groups. Participants were not randomly assigned to conditions.

A causal comparative research design is used to test for a cause and effect relationship between groups (Gay, 1987). This design focuses on the comparison rather than the relationship. Causal comparative research starts with the effect and tries to find the cause. This is also known as an ex post facto design because the researcher has no control over what occurred in the past (Gay, 1987). A weakness with this design is the lack of randomization (Fraenkel & Wallen, 2006). A strength is that relationships can be studied at a later time (Fraenkel & Wallen, 2006). As a means of accounting for the potential effects of preexisting differences, Muijs (2010) recommended assessing pre- and post differences in the dependent measures. This is because without using pretests, it is possible that between-group differences found on dependent measures may be due to preexisting differences rather than the effect of the treatment.

Setting and Sample

The population for this study was elementary students from two Title 1 K through 5 schools located in a rural county in Northeast Georgia. School 1 (referred to as FES) was established in 1938 and serves approximately 460 students. School 2 (referred to as CES) serves approximately 640 students, including two preK classes. The following tables represent the demographics for the elementary schools used in this study. Table 1 includes student demographics and Table 2 includes teacher demographics.

Table 1

Demographic Information for Students

Characteristic	FES	CES
Male	226	299
Female	209	317
Free or Reduced Lunch	50.57%	85.39%
Hispanic	23	299
American Indian	0	0
Asian	5	37
Black	2	25
Pacific Islander	0	1
White	383	118
Two or More Races	12	32

Note. Adapted from Georgia Department of Education (2015a).

Table 2

Teacher Demographics

Characteristics	CES	FES
Avg. Annual Salary	53,393.64	52,018.62
Full Time Staff	44	32
Part Time Staff	1	2
Male	1	2
Female	44	32
Bachelor's Degree	10	8
Master's Degree	20	17
Specialist Degree	15	9
Ph.D. Degree	0	0
Hispanic	1	0
American Indian	0	0
Asian	1	0
Black	0	0
Pacific Islander	0	0
White	43	34
2 or More Races	0	0
Avg. Years Experience	15.62 (SD)	15.32 (SD)

Note: Adapted from M. Vignati (personal communication, June 25, 2015).

Convenience sampling was used to choose the sample from the population. Convenience sampling is used when participants are chosen because they are available to be studied (Creswell, 2005). This type of sampling worked well for this study because the

sample was composed of fourth and fifth grade elementary students who were available at the testing sites. One stipulation for participation was the students had to be enrolled in and participate in fourth and fifth grade PE classes. The PE teachers were assigned using convenience sampling as well. The two teachers used in this study were already employed by the schools being studied.

Not all students enrolled at FES and CES take PE due to medical reasons. Approximately four students between the two schools did not take PE. Additionally, some students did not take PE in fourth and fifth grade, but did so in lower grade levels. Approximately 30 students between the two schools attended PE with different grade levels. Examples of these students would be the children in self-contained classrooms. The self-contained classrooms were composed of children who had been diagnosed with autism spectrum disorder, emotional and behavioral disorders, mild intellectual disability, moderate intellectual disability, and other health impairments (Georgia Department of Education, 2015b).

Teacher Participation

FES had a PE teacher who participated in class, and CES had a PE teacher who did not participate in class (M. Batson, personal communication, August 5, 2014). Participation, for the purpose of this study, was defined as being involved in the physical activities during class. Both teachers gave oral instructions and verbal praise to the students. Both teachers demonstrated exercises, and skills for the purpose of teaching. However, the PE teacher at FES also participated with the students throughout the class

period. This participation included such activities as running, stretching, playing games and sports, dancing, and more.

PE classes were 55 minutes at both schools and were held two to three times per week. This meant the PE teacher at FES was active for approximately 40 to 45 of the 55 minutes of class, minus the time for taking attendance, teaching the lesson, and leaving class. The PE teacher at FES had always participated with the students, and the PE teacher at CES did not (M. Batson, personal communication, August 5, 2014). I did not have to ask the CES teacher not to participate; it occurred naturally.

The PE teachers at CES and FES had paraprofessionals who were also part of the class. The paraprofessionals' jobs were to help the teachers in any way, including observation, demonstration, cleaning, and so on. Neither paraprofessional participated in physical activities with the classes. When the PE teacher at FES was absent, a substitute teacher would fill in for the day. On these days, the paraprofessional would participate with the classes at FES.

Power Analysis

A power analysis was conducted to determine the appropriate sample size for the study. Statistical power is defined as the probability that the null hypothesis will be rejected when a between-group treatment effect exists (Gravetter & Wallnau, 2009). Cohen (1965, 1977) recommended obtaining a minimum power level of .80. With that amount of statistical power, the probability of failing to reject the null hypothesis when an effect of the independent variable manipulation is present (a type II error) would be .20 (Gravetter & Wallnau, 2009). In addition to sample size, power is affected by effect

size, alpha level, the standard error of the dependent measure, and the decision to use a one- or two-tailed test of significance (Keppel, 1982). Using an online power analysis calculator (Lenth, 2009), with a FITNESSGRAM *sigma* of 8.05, I determined that a sample of 116 in each condition was required to provide a detectable between-group difference of 2.0 with a power level of .80. FES and CES had a combined population of 1,051 students in 2012, with 435 enrolled at FES and 616 at CES. The present study had a sample size of 132 students in the no-participation group and 179 students in the participation group, meeting the threshold required for the desired level of statistical power.

Instrumentation and Materials

There were two instruments used to collect data for this study. Participation grades were used to determine whether there was a difference between teacher participation and student participation. The participation grades were based on three subparts: wearing correct PE attire, behavior, and effort. All three subcategories made up the participation grade for PE. Correct PE attire included wearing tennis shoes and shorts or pants. When students did not wear the correct PE attire, they could not participate in PE for that day. Therefore, participation grades were dependent on wearing correct PE attire, showing good behavior, and putting forth effort during class. Participation grades were numerical and based on 100 points per day. The 100 points per day included the three subcategories having their own numerical values. Wearing correct PE attire was worth 50 points, behavior was worth 25 points, and effort was worth 25 points. Scores on this measure could range from 1 to 50 for dress, and 1 to 25 for behavior and effort. The

participation grades collected were entered into the grading software used by the board of education in the county where this study took place. Behavior was assessed using criteria such as following directions, good sportsmanship, and respect for equipment and others. Effort was assessed on the basis of students trying to participate in given activities. A student must attempt to perform the activity for effort to be considered given. Training provided by the school district on the criteria to be used to assess PE participation grades ensured that all PE teachers assigned these grades in the same manner. A copy of the sheet used to collect participation grades is included in Appendix A.

Assessing and grading in PE has always posed problems. Labindao (2009) stated that assessment in PE has always been criticized because it is seen as a lower subject, especially when compared with subjects such as math or science. Grading in PE must be discussed and decided upon by the PE teacher, administrator, and school system, if needed (Labindao, 2009). In the county studied, all elementary PE teachers had been trained by the director of elementary schools for the county to grade the same way with participation being based on effort, dress, and behavior. Effort was defined as a student showing an attempt at physical exertion in the activity being performed. Behavior was defined as a student showing good sportsmanship and respect for self, students, and staff. No data on interrater or test-retest reliability was available for PE grades. However, because reliability reflects the amount of error variance included in scores on a given measure (Davidshofer, Murphy, & Charles, 2005), training provided by the district on the criteria to be used to assess PE participation grades minimized error and maximized reliability.

The second instrument used was the FITNESSGRAM to determine whether teacher participation had an effect on student fitness. The FITNESSGRAM is an assessment taken annually in Grades 1 through 12. This test is a requirement for all PE classes in the state of Georgia. Individual results are sent to Georgia's Depart of Education (Human Kinetics, 2012). This served as a pretest-posttest measure. As a means of accounting for preexisting differences in fitness between the two classes studied, pre-to-post changes in FITNESSGRAM scores for each student were examined.

The FITNESSGRAM is used to test students in five categories. Aerobic capacity was measured by using the progressive aerobic cardiovascular endurance run (PACER) test (Human Kinetics, 2012). Curl ups and 90 degree push ups were used to measure muscular strength and endurance. Back-saver sit and reach was used to measure flexibility. Lastly, body composition was tested by BMI. Numerical scores were recorded for each student. These scores could range from 1 to 75 for push ups and curl ups, and 1 to 12 for back-saver sit and reach. For the PACER, students run as many laps as possible without quitting or making a mistake. BMI is determined by using age percentile charts for gender. Each score for each category is compared to a standard for that child's age and gender. Results of the FITNESSGRAM can be used to determine whether students fall into the healthy fitness zone (HFZ) (Human Kinetics, 2012). Based on students overall FITNESSGRAM score, there are three zones that students may fall into: HFZ, Needs Improvement Some Risk, and Needs Improvement High Risk. HFZ scores are different for each gender and based on age. Therefore, there are not set scores, but different scores for different students. The scores from the various fitness tests are

combined into a continuous ratio-level score. This score is generated by the FITNESSGRAM software and then categorized to make reporting of the outcomes easier. Each student at each school was coded by a number. This number was used when entering data into Statistical Package for the Social Sciences (SPSS).. A copy of the sheet used to collect FITNESSGRAM scores is available in Appendix B.

A board of scientists developed the FITNESSGRAM (Plowman & Meredith, 2014). The FITNESSGRAM uses criterion referenced health standards to help the students understand their fitness results. Many associations have partnered with the FITNESSGRAM, including the President's Council on Fitness, Sports, and Nutrition, American Alliance for Health, Physical Education, and Dance, the CDC, Amateur Athletic Union, and NASPE (Plowman & Meredith, 2014). All 50 states and 14 countries are currently using the FITNESSGRAM. California, Delaware, Georgia, and Texas all require this testing as part of their PE curriculum (Plowman & Meredith, 2014).

Independent Variable Manipulation

During the time data were being collected, the PE teacher at FES participated with the students while the teacher at CES did not participate. Participation during class included, but was not limited to, stretching, running, and playing games with the students. Games included such activities as basketball, dodgeball, floor hockey, volleyball, jump rope, soccer, and more. The PE teacher at FES participated every day that she was present. A substitute teacher was brought in for three days throughout the school year when the teacher was absent. Each PE teacher at each school had a paraprofessional in the gym for assistance. When the teacher was absent, the paraprofessional would

participate instead. This was to ensure that an adult was participating with the students every day. Since the PE teacher as FES was the researcher, participation in class was guaranteed.

The PE teacher at CES did not participate with the students. The only physical activity that occurred by the teacher was for teaching and demonstration purposes. The PE teacher was absent two days during the school year, and a substitute teacher was used. The paraprofessional at CES helped to ensure that the substitutes did not participate. I spoke with the PE teacher at CES weekly to ensure nonparticipation.

Data Collection

This study made use of archived data collected from August 2012 until May 2013. During this time, the PE teacher at FES participated daily in the physical activities with the students during class while the PE teacher at CES did not. The PE teacher at each school collected participation grades throughout the nine month period.

The FITNESSGRAM was assessed twice during a nine month period, once at the beginning and once at the end. As described in the Instrumentation section above, the students were coded through numerical referencing in order to assess their change in fitness. I administered the FITNESSGRAM during PE at FES, and it was administered by the PE teacher at CES. Data were collected and entered into the FITNESSGRAM software. The results were based on individual student scores, based on age and gender. The information from the pretests was compared to the information from the posttests in order to see if there was a change in the number of students in the HFZ at each school.

Data Analysis

The hypotheses were tested as follows using the SPSS, version 21.

H_o1: Higher levels of student participation in physical activity as measured by participation grades will not be observed among students who have a physical education teacher who participates in physical activities with the class than those with a physical education teacher who does not participate in physical activities with the class.

H_a1: Higher levels of student participation in physical activity as measured by participation grades will be observed among students who have a physical education teacher who participates in physical activities with the class than among those with a physical education teacher who does not participate in physical activities with the class.

An independent-sample *t* test was used to test this null hypothesis. This analysis was selected because two separate samples are being used, and therefore, the mean difference between two populations can be evaluated (Gravetter & Wallnau, 2009). Some assumptions underlying the use of an independent-sample *t* test include dependent variables being measured on a continuous scale; independent variable is consisted of two categorical groups, and independence of observation (Laerd Statistics, 2013). The independent variable was defined as teacher participation in physical activities in PE. Participation and nonparticipation make up the categorical groups. The dependent variable was defined as student participation in physical activities in PE. Student participation was measured numerically by participation grades. Participation grades were on a continuous scale of 1 to 100. There was no relationship between the two schools, keeping observations independent. No student or teacher was at both schools.

H_o2: Greater pre-to-post increases in levels of student fitness as measured by the FITNESSGRAM will not be observed among students who have a physical education teacher who participates in physical activities with the class than among those with a physical education teacher who does not participate in physical activities with the class.

H_a2: Greater pre-to-post increases in levels of student fitness as measured by the FITNESSGRAM will be observed among students who have a physical education teacher who participates in physical activities with the class than among those with a physical education teacher who does not participate in physical activities with the class.

An independent-sample *t* test was used to determine if the pre-to-post increase in FITNESSGRAM scores (derived by subtracting pretest scores from posttest scores) were greater in the teacher participation condition. The independent variable was defined as teacher participation in physical activities in PE. The dependent variable was defined as students' fitness and was assessed using the FITNESSGRAM.

Measures to Protect Participants

Names were removed from the archival FITNESSGRAM scores and participation grades at FES before being shared with me. This way the students were anonymous due to the fact that I was the PE teacher at FES. Scores and grades from CES were delivered in a private envelope to FES so that only the tester and I saw the data. As a result, letters of cooperation providing permission to access the data set were required, but documentation of parental consent and student assent were not needed.

Summary

Data collection took place over a nine month period at FES and CES. Fourth and fifth grade students participated in the FITNESSGRAM assessment. This assessment occurred twice as a pretest, posttest. Also during this nine month timeframe, the PE teacher at each school collected participation grades.

Section 4: Results

In this section, I describe the sample, address the research questions and hypotheses, and report the findings. The purpose of this quasi-experimental quantitative study was to determine whether modeling of physical activity by a PE teacher would increase the participation of students in PE class activities, and increase their physical fitness in the process. Observational learning provided the theoretical framework. This study included fourth and fifth grade students in PE at two elementary schools. One school, FES, had a PE teacher who participated in physical activities, while the other school, CES, had a PE teacher who did not participate. Participation grades in PE from the 2012-2013 school year, as well as students' scores from the FITNESSGRAM assessment taken that same year, were analyzed using one-tailed independent-sample *t* tests.

The use of a one-tailed test is justified if prior research supports the use of a directional hypothesis (Ruxton & Neuhäuser, 2010). Numerous studies have shown that student participation in physical activity can decrease childhood obesity and positively affect health (Shaya et al., 2008; Shofan et al., 2011). I expected an increase in student participation and a positive influence on student health. Another justification of the use of a one-tailed test is that a finding of a difference in the opposite direction would be treated in the same way as a finding of no differences between the groups (Ruxton & Neuhäuser, 2010). For example, findings of higher student participation and FITNESSGRAM student scores in the teacher nonparticipation group would result with the same outcomes.

Because nonparticipation by teachers is the norm, a support of that approach would not change how PE is taught.

Data Collection

Archived data from 2012 to 2013 were used for this study. During this time, participation grades in PE were collected weekly. The PE teachers at FES and CES assessed participation in PE based on three subcategories: wearing correct PE attire, behavior, and effort. The grades were collected and stored in the grading software used by the board of education. During this time period, the FITNESSGRAM physical fitness assessment was also measured. This test was taken twice throughout the school year as a pretest and posttest. The FITNESSGRAM was administered in early 2012 and late 2013. Each PE teacher assessed and collected the scores. Data were then entered into the FITNESSGRAM website. Data were analyzed to assess students' change in fitness.

Data Analyses

Data were analyzed using the SPSS, version 21. Participation grades for PE and the FITNESSGRAM scores were analyzed using independent-sample *t* tests. Participation grades were collected to determine whether teacher participation in PE would have an effect on student participation in PE. Participation grades were based on three subcategories: behavior, effort, and wearing correct PE attire. Grades were collected for fourth and fifth grade students at FES and CES from 2012-2013. The null hypothesis stated that higher levels of student participation in physical activity as measured by participation grades are not observed among students who have a physical education

teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

Table 3 presents independent-sample *t* tests for the PE participation grades at FES and CES. FES had a PE teacher who had participated in daily physical activities; the CES teacher did not participate. As shown in Table 3, the mean participation grade obtained in the no participation condition was significantly higher than the mean grade obtained in the participation condition. The partial eta squared effect size for this independent-sample *t* test was .012, which indicates that approximately 1% of the variance in participation grades can be accounted for by the teacher participation manipulation. Consistent with the directional null hypothesis, higher levels of student participation in physical activity were not observed among students who have a physical education teacher who participates in physical activities with the class. As a result, despite the significant between-group difference obtained for the measure of student participation, H_o1 could not be rejected.

Table 3

Mean Scores for Participation Grades in PE

Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Participation	132	99.8	.412	-1.80	192	0.03
No Participation	179	99.9	.234			

The FITNESSGRAM was given as a pretest, posttest at both FES and CES. The FITNESSGRAM was used to test students in five areas: aerobic capacity, flexibility, muscular strength, muscular endurance, and body composition. Student scores in these

areas were used to determine whether students fell into the HFZ (Human Kinetics, 2012). Fourth and fifth grade students were tested twice from 2012 to 2013, and the number of HFZ categories they fell into provided the data for this study. The changes in the number of HFZ categories for each student were compared from pretest to posttest. The null hypothesis stated that greater pre-to-post increases in levels of student fitness as measured by the FITNESSGRAM are not observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

Table 4 provides data collected for H_o2. Changes in pre-to-post test scores for the FITNESSGRAM were used to run an independent-sample *t* test. Mean FITNESSGRAM change scores for both groups were nearly equal, which resulted in a one-tailed $t(156)$ value of .07 that did not exceed the threshold for statistical significance. As a result, H_o2 could not be rejected.

Table 4

Mean Scores for FITNESSGRAM HFZ

Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Participation	101	.198	1.12	.070	156	.470
No Participation	296	.189	.989			

Summary

This causal-comparative study focused on how teacher participation in PE could impact student participation in PE. The study also focused on how teacher participation could influence students' fitness. Archived data collected from 2012 to 2013 were used from two elementary schools. Higher levels of student participation in physical activity

were not observed among students who had a physical education teacher who participated in physical activities with the class. To the contrary, higher levels of participation were observed in the no-participation condition. As a result, H_o1 could not be rejected. An independent-sample *t* test was conducted to determine changes in pre-to-post test scores for the FITNESSGRAM, as well. Because the mean scores for both schools were almost equal, this resulted in a $t(156)$ value of .07, which did not exceed the threshold for statistical significance, $p = .470$. Therefore, H_o2 could not be rejected. Section 5 contains a summary and interpretation of the findings, implications for social change, and recommendations for action.

Section 5: Summary, Conclusions, and Recommendations

The purpose of this causal-comparative quantitative study was to determine whether there was a difference in student PE participation between students of teachers who do and do not participate in the activities required of students in their classes. The second purpose was to determine whether there was a difference in student fitness between students of teachers who do and do not participate in the activities required of students in their classes. The rising rate of childhood obesity, along with a decrease in physical activity in children, provided the background for the study. This study was conducted using archived data from 2012 to 2013. Participation grades in PE were collected weekly. The FITNESSGRAM was used to assess student fitness twice as a pretest, posttest. Fourth and fifth grade students from two rural elementary schools in Northeast Georgia were used. At one school, the PE teacher participated in physical activities with the students, and at the other school the PE teacher did not participate.

The participation grades for PE and the FITNESSGRAM scores were analyzed using independent-sample *t* tests. For the PE participation grades, there was not a statistically significant difference between the two schools. This indicated that the first null hypothesis could not be rejected. The FITNESSGRAM pretest, posttest scores provided mean scores that were nearly equal from both schools. This resulted in a value that did not exceed the threshold for statistical significance, and resulted in the second null hypothesis not being rejected. In this section, I present the interpretation of findings, implications for social change, recommendations for action, and recommendations for future research.

Interpretations of Findings

This study addressed the following research questions and hypotheses. RQ1 asked the following: What is the effect of teacher participation in physical education on student participation? The null hypothesis stated that higher levels of student participation in physical activity as measured by participation grades are not observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities. RQ2 asked the following: What is the effect of between teacher participation in physical education and students' fitness? The null hypothesis stated that greater pre-to-post increases in levels of student fitness as measured by the FITNESSGRAM are not observed among students who have a physical education teacher who participates in physical activities compared to those with a physical education teacher who does not participate in physical activities.

The results did not show a statistically significant difference between the two groups based on PE participation grades. Higher levels of student participation in physical activity were not observed among students who had a PE teacher participating in physical activities compared to those with a PE teacher who did not participate. This indicated that the H_o1 could not be rejected.

The results of the second part of this study showed no statistically significant difference between the two groups based on FITNESSGRAM scores. An independent-sample *t* test was used to analyze changes in pre-to-post test scores for the FITNESSGRAM. The mean scores for each group were nearly equal, which meant that

greater pre-to-post increases in levels of student fitness were not observed among students who had a PE teacher who participated in physical activity compared to those who did not have a PE teacher who participated. Therefore, H_o2 could not be rejected.

The ACS, the ADA, and the AHA (2008) reported that PE is an important aspect of a child's life and physical activity can combat childhood obesity. Because children spend most of their time in schools, it can be a great place for students to be physically active (Shofan et al., 2011). Jansen (2014) found that active play, like that in PE programs, resulted in the highest number of calories expended per day, and therefore could make a positive impact on student health.

Research on the effects of teacher participation in PE is inconclusive. According to Green and Reese (2007), the PE teacher is the most important part of a PE program by creating an environment that makes the students want to participate. PE teachers should be role models (NASPE, 2010) and lead by example by being physically active and physically fit (Rink et al., 2010). Teachers should always have students in front of them so they are able to view the whole class at one time, making it almost impossible for them to participate in activities (PECentral.org, 2015).

I found that teacher participation in PE did not help to increase student participation in physical activity in class. This could be due to insufficient variability in participation grades for each school. No child, at either school, received a grade below a 97 in PE for that year. Although the students may have participated less, the grades did not reflect it. Moreover, the higher participation grades reported in the no participation condition could be due to grading inconsistencies between the two schools. Although the

PE teachers were trained on how to grade, the shoes allowed in PE were left to the teachers' discretion. The participation condition only allowed tennis shoes to be worn during PE. The no participation condition allowed any shoes that had rubber soles and closed toes, not just tennis shoes (M. Batson, personal communication, August 5, 2014). Therefore, more students were able to participate in the no participation condition. Furthermore, the grading instrument used to assign participation grades relied heavily on attire rather than actual physical participation. Finally, this study only addressed participation during class and not physical activity outside of school. Although PE could be an excellent opportunity to promote health, students who participate in class when the teacher participates may not realize a significant impact on their health if they are not active outside of class.

Observational learning theory provided the theoretical framework for this study. People learn new behaviors by watching other people (Bandura, 1971). Bandura (1971) stated that people's behaviors are learned by following examples. Considering the results of this study, it is possible the students saw the teacher being active and were motivated to do the same, but the data did not support it. Bandura's (1978) reciprocal determinism states that there are three factors that influence a person's behavior: the environment, the individual, and the behavior itself. The students' behaviors (participation in physical activity) were influenced by the social and physical surroundings in PE, by their own personal characteristics (attributions, goals, etc.), and the actions of the other students. Therefore, teacher participation may not have been the only influential factor on student participation. This could explain why participation was not higher at the school where

there was teacher participation. The students may have enjoyed PE more with the teacher not participating. It is also possible that students observed other students in the class being active, and that motivated them to participate.

Implications for Social Change

Childhood obesity is an epidemic at the national and local level. Rates of childhood obesity have tripled in the past four decades (Helping Hands Outreach, 2010). Obesity at a young age can cause hypertension, heart disease, type 2 diabetes, and low self esteem (Shaya et al., 2008). These problems can even carry over into adulthood (Li & Hooker, 2010). Not only does childhood obesity affect a person's health, it has an effect on society, as well. Hospital costs related to childhood obesity have risen (Shaya et al., 2008). Children who are physically active have a better chance of being healthy (NASPE, 2001). PE is a could be a tool to promote physical activity in children.

This study contributes to positive social change by providing additional analysis of the effect of teacher participation on student PE participation and student health. Its findings indicate means by which the effects of this practice can be assessed more effectively. Findings may be used by other researchers to investigate the effects of PE teacher participation on student participation and fitness. Although my findings did not indicate a positive impact on student fitness, prior research has shown that physical activity, in general, can help improve a person's health. With more children being physically fit, perhaps a change could be seen in the reduction of medical costs related to childhood obesity. Healthier children may grow into healthier adults (National Research Council, 2004). Future researchers may mitigate the limitations of the present study and

may detect increases in student health and PE class participation as a result of teacher participation, which could lead to positive health outcomes for both children and adults.

Recommendations for Action

Although data from this study did not indicate greater pre-to-post increases in levels of student health in the participation group compared to the no participation group, previous research showed that PE could be used to help prevent childhood obesity (Timpka et. al, 2012). Many students spend most of their day at school, making it the perfect opportunity to help combat childhood obesity (Steglin, 2008). However, according to Green et al. (2012), only 3.8% of U.S. elementary schools offer PE daily. Because schools come in contact with children frequently, they should be charged with helping children be healthy. More PE time for elementary school students, as well as middle and high school students, should be considered nationally and locally. In a time when childhood obesity is on the rise, state representatives should do more to ensure kids are offered PE daily. Local school boards and principals need to make sure the students are actually receiving the recommended or mandated PE. Most importantly, PE teachers need to do their best to promote high levels of physical activity before, during, and after school (Rink et al., 2010).

Data from this study did not indicate higher levels of student participation in the class in which the PE teacher participated in physical activities. Previous research has not shown a link between teacher participation and student participation. Organizations such as NASPE (2011) have encouraged PE teachers to be role models for their students. Even though the findings from this study suggest that teacher participation does not help

increase student participation, PE teachers could, and should, participate more with their students. Teachers need to be role models for their students (Rink et al., 2010).

Recommendations for Future Research

Children are becoming more obese, and schools should be charged with helping combat this epidemic. Physical education can be used to promote physical activity and health. Previous research has shown that PE is not always mandatory, or offered, in elementary schools across the country (Green et al., 2012). Future research should address ways to increase PE time in schools, as well as the benefits of having daily PE. This study resulted indicated that teacher participation in PE does not affect student fitness. Research has shown that teacher participation should be influential to students (NASPE, 2011), but may not always be. This study was conducted at two rural elementary schools. Future researchers may examine more than two schools for a longer period of time. Also, participation grades were used to measure student participation in this study. Further researchers could find a better way to measure student participation. For example, rather than using a grade that is based in part on a student's adherence to a dress code, future researchers could use direct observation to measure student participation.

More research is needed that addresses the variables used in this study. In future studies, participation grades should have a greater range of scores. This could be possible if participants took more time to collect scores, or if more than two schools were used. Also, participation grades could be based on something other than appropriate dress. A

true measure of participation could be used, such as a checklist or tally marks for every minute a child is participating. For this study, random assignment was not possible.

Pedometers can be used to track physical activity in PE. Benefits of using pedometers include low cost, comfort, and immediate feedback (Morgan, Pangrazi, & Beighle, 2003). Teachers could use pedometers to track the steps taken during PE. Over time, data may show whether students increased or decreased their steps in PE, indicating how active they were during class. According to Morgan et al. (2003), daily PE could increase an elementary student's steps by an average of 134,000 per school year. This is approximately 38 to 63 miles walked per year. In turn, a child could burn an additional 6,300 calories per year (Morgan et al., 2003).

As previous research has shown, physical activity in and out of PE is beneficial to a child's health (Timpka et. al, 2012). It would be beneficial for future research to address whether teacher participation in PE has any influence on student participation in physical activity after school. Also, researchers could examine whether students involved in after school activities experienced an increase in health. Additional research on teacher participation in physical education is worthwhile. However, future researchers would need to use better ways to measure student participation. One final recommendation for future research would be to use another fitness assessment besides the FITNESSGRAM. Perhaps using a different assessment might deliver different results that are not based on body composition, aerobic capacity, flexibility, or muscle strength and endurance.

Conclusion

This causal-comparative quantitative study was used to determine whether there was a difference in student PE participation and student fitness between students of teachers who do an do not participate in the activities required of students in their classes. Archived data from 2012-2013 from fourth and fifth grade students in two rural elementary schools in Northeast Georgia were used for this study. Participation grades were used to measure student participation and the FITNESSGRAM was used to measure student fitness. Participation grades and FITNESSGRAM scores were analyzed using independent-sample *t* tests. There was not a statistically significant difference between the two schools in terms of participation grades, and the first null hypothesis could not be rejected. Future research should find a better way to measure participation grades, as well as examine more than two schools and for a longer period of time. The FITNESSGRAM scores from each school were nearly equal. This resulted in a value that did not exceed the threshold for statistical significance. Therefore, the second null hypothesis could not be rejected. Future research should focus on ways to measure student fitness other than the FITNESSGRAM.

References

American Academy of Child and Adolescent Psychiatry. (2016). Obesity in children and teens. Retrieved from http://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/Obesity-In-Children-And-Teens-079.aspx

American Academy of Pediatrics. (2006). Active healthy living: Prevention of childhood obesity through increased activity. *Pediatrics*, *117*(5), 1834-1842. http://dx.doi.org/10.1542/peds.2006-0472

American Cancer Society, American Diabetes Association, & American Heart Association. (2008). *Physical education in schools- Both quality and quantity are Important.* Retrieved from https://www.heart.org/idc/groups/heart-public/@wcm/@adv/documents/downloadable/ucm_446067.pdf

Anderson, L. M., & Phelps, L. (2009). School-wide healthy weight behaviors: Promoting universal longevity via school-family ecologies (PULSE). *Psychology in the Schools*, *46*(8), 748-755. http://dx.doi.org/10.1002/pits.20413

Arem, G. L. (2009). Three strategies for grading on improvement in physical education. *Kappa Delta Pi Record*, *45*(3), 132-134. http://dx.doi.org/10.1080/00228958.2009.10517303

Baghurst, T. (2013). How physical education teachers undermine the profession by grading effort and participation. *Oklahoma AHPERD*, *50*(3), 51-55. Retrieved from http://ojs.library.okstate.edu/osu/index.php/OAHPERD/article/view/1479/1313

Bandura, A. (1971). *Social learning theory*. New York: NY, General Learning Press.

Bandura, A. (1978). The self system in reciprocal determinism. *American Psychologist*, *33*(4), 344-358. http://dx.doi.org/10.1037/0003-066X.33.4.344

Barton, M. (2012). Childhood obesity: A life-long health risk. *Acta Pharmacologica Sinica*, *33*(2), 189-193. http://dx.doi.org/10.1038/aps.2011.204

Bishop, J., Middendorf, R., Babin, T., & Tilson, W. (2005). *ASPE Research Brief: Childhood obesity*. Retrieved from http://aspe.hhs.gov/health/reports/child_obesity/index.cfm

Bromfield, P. (2009). Childhood obesity: Psychosocial outcomes and the role of weight bias and stigma. *Educational Psychology in Practice*, *25*(3), 193-209. http://dx.doi.org/10.1080/02667360903151759

Centers for Disease Control and Prevention. (2010a). State indicator report on physical activity, 2010 national action guide. Retrieved from https://www.cdc.gov/physicalactivity/downloads/PA_State_Indicator_Report_2010_Action_Guide.pdf

Centers for Disease Control and Prevention. (2010b). State indicator report on physical activity, 2010. Retrieved from http://www.cdc.gov/physicalactivity/downloads/PA_State_Indicator_Report_2010.pdf

Centers for Disease Control and Prevention. (2011a). Childhood obesity causes & consequences. Retrieved from http://www.cdc.gov/obesity/childhood/problem.html

Centers for Disease Control and Prevention. (2011b). Glossary of terms. Retrieved from http://www.cdc.gov/physicalactivity/everyone/glossary/index.html

Centers for Disease Control and Prevention. (2012a). Defining childhood obesity. Retrieved from http://www.cdc.gov/obesity/childhood/basics.html

Centers for Disease Control and Prevention. (2012b). U.S. obesity trends. Retrieved from https://www.cdc.gov/obesity/data/databases.html

City-Data. (2013). Habersham County, Georgia. Retrieved from www.city-data.com/county/Habersham_County-GA.html

Cohen, J. (1965). Some statistical issues in psychological research. In B.B. Wolman(Ed.). *Handbook of Clinical Psychology*. New York, NY: McGraw-Hill.

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences* (Rev. ed.) New York, NY: Academic Press.

Collins, L. M., Dziak, J. J., & Li, R. (2009). Design of experiments with multiple Independent variables: A resource management perspective on complete and reduced factorial designs. *Psychol Methods*, *14*(3), 202-224. http://dx.doi.org/10.1037/a0015826

Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (2nd ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Daniels, S. R. (2006). The consequences of childhood overweight and obesity. *Future Child, 16*(1), 47-67. http://dx.doi.org/10.1353/foc.2006.0004

Daniels, S. R., Jacobson, M. S., McCrindle, B. W., Eckel, R. H., & Sanner, B. M. (2009). American heart association childhood obesity research summit report. *Journal of the American Heart Association*, *119,* 489-517. http://dx.doi.org/10.1161/Circulationaha.109.192216

Davidshofer, K., Murphy, R., & Charles, O. (2005). *Psychological testing: Principles and applications* (6th ed. ed.). Upper Saddle River, NJ: Pearson/Prentice Hall. ISBN 0-13-189172-3

Deckelbaum, R. J., & Williams, C. L. (2001). Childhood obesity: The health issue. *Obesity Research*, *9*(4), 239-243. http://dx.doi.org/10.1038/oby.2001.125

Dehghan, M., Akhtar-Danesh, N., & Merchant, A. T. (2005). Childhood obesity, prevalence and prevention. In R.S. Ahima (Ed.), *Childhood obesity: Prevalence, pathophysiology, and management*. Oakville, ON: Apple Academic Press.

F as in Fat 2010 Georgia Press Release. (2010). *New Report: Georgia ranks 17th most obese state in the nation*. Retrieved from http://healthyamericans.org/reports/obesity2010/release.php?stateid=GA

FindtheBest. (2013). Habersham County, GA: Health Information 2008. Retrieved from diabetes-obesity.findthebest.com

FITNESSGRAM. (2012). What is FITNESSGRAM? Retrieved from http://www.fitnessgram.net/parents-students.asp#a01

Fjørtoft, I., Pederson, A. V., Sigmundsson, H., & Vereijken, B. (2011). Measuring physical fitness in children who are 5 to 12 years old with a test battery that is functional and easy to administer. *Physical Therapy*, *91*(7), 1087-1095. http://dx.doi.org/10.2522/ptj.20090350

Flores, G., & Lin, H. (2013). Factors predicting severe childhood obesity in kindergartners. *International Journal of Obesity*, *37*(1), 31-39. http://dx.doi.org/10.1038/ijo.2012.168

Flynn, J. (2013). The changing face of pediatric hypertension in the era of the childhood obesity epidemic. *Pediatric Nephrology*, *28*(7), 1059-1066. http://dx.doi.org/10.1007/s00467-012-2344-0

Fraenkel, J. R., & Wallen, N. E. (2006). *How to design and evaluate research in education* (6th ed.). Boston: McGraw-Hill.

Gay, L. R. (1987). *Educational research: Competencies for analysis and application* (3rd ed.). New York: Merill.

Georgia Department of Community Health. (2010). *Georgia adult obesity by county*. Retrieved from https://dph.georgia.gov/sites/dph.georgia.gov/files/2007%20Obese%20Adults%20in%20Georgia%20by%20County.pdf

Georgia Department of Education. (2015a). Enrollment by Ethnicity/race, gender and grade level (PK-12*)*. Retrieved from: https://app3.doe.k12.ga.us/ows-bin/owa/fte_pack_ethnicsex.entry_form

Georgia Department of Education. (2015b). Student enrollment by disability. Retrieved from: https://app3.doe.k12.ga.us/ows-bin/owa/fte_pack_swd_enroll_pub.entry_form

Georgia Department of Human Resources. (2005). *Overweight and obesity in Georgia*. Retrieved from https://dph.georgia.gov/sites/dph.georgia.gov/files/2005%20Overweight-Obesity.pdf

Georgia Department of Public Health. (2013). Georgia children no longer second most obese in nation. Retrieved from https://dph.georgia.gov/press-releases/2013-09-04/georgia-children-no-longer-second-most-obese-nation

Gollust, S., Niederdeppe, J., & Barry, C. (2013). Framing the consequences of childhood obesity to increase public support for obesity prevention policy. *American Journal of Public Health*, *103*(11), 96-102. http://dx.doi.org/10.2105/ajph.2013.301271

Gordon-Larsen, P., McMurray, R. G., & Popkin, B. (2000). Determinants of adolescent physical activity and inactivity patterns. *Pediatrics*, *105*(6), 1-8. http://dx.doi.org/10.1542/peds.105.6.e83

Gorsky, R., Pamuk, E., Williamson, D., Shaffer, P., & Koplan, J. (1996). The 25-year health care costs of women who remain overweight after 40 years of age. *American Journal of Preventative Medicine*, *12,* 388-394. Retrieved from www.ncbi.nlm.nih.gov/pubmed/8909650

Gravetter, F. J., & Wallnau, L. (2009). *Statistics for the behavioral sciences* (8th ed.). Belmont, CA: Wadsworth.

Green, G., & Reese, S. A. (2007). Childhood obesity: A growing phenomenon for physical educators. *Education*, *127*(1), 121-124. Retrieved from http://eyzin.minedu.gov.gr/Documents/Physical%20Education%20programmes-obesity.pdf

Green, G., Riley, C., & Hargrove, B. (2012). Physical activity and childhood obesity: Strategies and solutions for schools and parents. *Education*, *132*(4), 915-920. Retrieved from http://sfxhosted.exlibrisgroup.com/waldenu?url_ver=Z39.88-2004&ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&rft.object_id=960238587212&sfx.request_id=7672465&sfx.ctx_obj_item=0

Gribbons, B., & Herman, J. (1997). True and quasi-experimental designs. *Practical Assessment, Research, & Evaluation*, *5*(14). Retrieved from http://PAREonline.net/getvn.asp?v=5&n=14

Griffiths, C., Gately, P., Marchant, P. R., & Cooke, C. B. (2013). A five year longitudinal study investigating the prevalence of childhood obesity: comparison of BMI and waist circumference. *Public Health, 127*(12), 1090-1096. http://dx.doi.org/10.1016/j.puhe.2013.09.020

Guinhouya, B. (2012). Physical activity in the prevention of childhood obesity. *Paediatric and Perinatal Epidemiology*, *26*(5), 438-447. http://dx.doi.org/10.1111/j.1365-3016.2012.01269.x

Hammond, R. A., & Levine, R. (2010). The economic impact of obesity in the United States. *Diabetes, metabolic syndrome, and obesity: Targets and therapy*, 285-295. http://dx.doi.org/10.2147/dmsott.s7384

Helping Hands Outreach. (2010). *Georgia's obesity statistics*. Retrieved from http://helpinghandsga.com/ObesityStatistics.aspx

Herouvi, D., Karanasios, E., Karayianni, C., & Karavanaki, K. (2013). Cardiovascular disease in childhood: The role of obesity. *European Journal of Pediatrics*, *172*(6), 721-732. http://dx.doi.org/10.1007/s00431-013-1932-8

Horn, R. R., & Williams, A. M. (2004). Observational learning. In Williams, A. M. & Hodges, N. J. (Eds.), *Skills acquisition in sport: Research, theory, and practice* (pp. 175-203). Retrieved from https://books.google.com/books?hl=en&lr=&id=Tm-BAgAAQBAJ&oi=fnd&pg=PA175&dq=Horn,+R.+R.+%26+Williams,+A.+M.+(2004).+Observational+learning&ots=Yu20deuGMS&sig=2qH_pSaPtCLwMcW0_Kgj7dkB2T0#v=onepage&q&f=false

Human Kinetics. (2012). Why FITNESSGRAM? Retrieved from http://www.fitnessgram.net/teachers.asp#a01

Janssen, I. (2014). Active play: An important physical activity strategy in the fight against childhood obesity. *Canadian Journal of Public Health*, *105*(1), 22-27. http://dx.doi.org/10.1016/j.jcjd.2015.01.032

Karnik, S., & Kanekar, A. (2012). Childhood obesity: A global public health crisis. *International Journal of Preventive Medicine*, *3*(1), 1-7. http://dx.doi.org/10.1201/b18227-3

Keating, X. D., & Silverman, S. (2009). Teachers' use of fitness tests in school-based physical education programs. *Measurements in Physical Education and Exercise Science*, *8*(3), 145-165. Retrieved from http://sfxhosted.exlibrisgroup.com/waldenu?sid=google&auinit=XD&aulast=Keating&atitle=Teachers%27+use+of+fitness+tests+in+school-based+physical+education+programs&id=doi:10.1207/s15327841mpee0803_2&title=Measurement+in+physical+education+and+exercise+science&volume=8&issue=3&date=2004&spage=145&issn=1091-367X

Keppel, G. (1982). *Design and analysis: A researcher's handbook* (2nd ed.). Engelwood Cliffs, NJ: Prentice Hall.

KIDSCOUNT. (2006). Children and teens overweight or obese by gender. http://datacenter.kidscount.org/data/tables/27-children-and-teens-overweight-or-obese-by-gender?loc=12&loct=2#detailed/2/12/false/1021,18,14/14,15,16/296

Kohl, H. W., & Cook, H. D. (2013). *Educating the student body: Taking physical activity and physical education to school*. Washington, DC: National Academic Press

Labinadao, M. C. (2009). *Assessment and grading in physical education*. Retrieved https://www.scribd.com/doc/34410580/Assessment-and-Grading-in-Physical-Education

Laerd Statistics. (2013). *Independent t-test using SPSS statistics*. Retrieved from http://statistics.laerd.com/spss-tutorials/independent-t-test-using-spss-statistics.php

Lenth, R. V. (2009). *Java applets for power and sample size (Computer software)*. Retrieved from http://www.stat.uiowa.edu/~rlenth/Power

Levi, J., Rayburn, J., Segal, L. M., & Martin, A. (2015). *The state of obesity: 2015*. Retrieved from stateofobesity.org/files/stateofobesity2015.pdf

Levy, L. Z., & Petty, K. (2008). Childhood obesity prevention: Compelling challenge of the twenty-first century. *Early Child Development and Care*, *179*(6), 609-615. http://dx.doi.org/10.1080/03004430600852072

Li, J., & Hooker, N. H. (2010). Childhood obesity and schools: Evidence from the national survey of children's health. *Journal of School Health*, *80*(2), 96-103. http://dx.doi.org/10.1111/j.1746-1561.2009.00471.x

Lightwood, J., Bibbins-Domino, K., Coxson, P., Wang, C., Williams, L., & Goldman, L. (2009). Forecasting the future economic burden of current adolescent overweight: An estimate of the coronary heart disease policy model. *American Journal of Public Health*, *99*(12), 649-658. http://dx.doi.org/10.2105/ajph.2008.152595

Linchey, J., & Madsen, K. A. (2011). State requirements and recommendations for school-based screenings for body mass index or body composition, 2010. *Preventing Chronic Disease*, *8*(5), 1-7. Retrieved from http://www.cdc.gov/pcd/issues/2011/sep/11_0035.htm

Lindsey, A. R, Hongu, N., Spears, K., Idris, R., Dyrek, A., & Manore, M. M. (2014). Field assessment for obesity prevention in children and adults: Physical activity, fitness, and body composition. *Journal of Nutrition Education and Behavior*, *46*(1). http://dx.doi.org/10.1016/j.jneb.2013.03.013

Merriam-Webster (2012). Retrieved from http://www.merriam-webster.com/dictionary/physical%20education

Miller, N. E., & Dollard, J. (1941). *Social learning and imitation.* New Haven, CT: Yale University Press.

Morgan, C. F., Pangrazi, R. P., & Beighle, A. (2003). Using pedometers to promote physical activity in physical education. *Journal of Physical Education, Recreation & Dance*, *74*(7), 33-38. http://dx.doi.org/10.1080/07303084.2003.10609235

Muijs, D. (2010). *Doing quantitative research in education with SPSS (2nd* ed). Thousand Oaks, CA: SAGE Publications.

Must, A., & Strauss, R. S. (1999). Risks and consequences of childhood and adolescent obesity. *Journal of the International Association for the Study of Obesity, 23*(2), 2-11. http://dx.doi.org/10.1038/sj/ijo/0800852

National Association for Sport and Physical Education. (2001). *Physical education is critical to a complete education*. Retrieved from http://www.cfsd16.org/schools/canyonview/files/pe/PEIsCritical.pdf

National Association for Sport and Physical Education. (2010). *A philosophical position on physical activity and fitness for physical activity professionals: A position statement*. Retrieved from

http://www.shapeamerica.org/advocacy/positionstatements/sports/loader.cfm?csModule=security/getfile&pageid=4604

National Association for Sport and Physical Education. (2011). *Code of conduct for p-12 physical education teachers*. Position Statement. Retrieved from https://classdat.appstate.edu/CHS/RMPE/townsndjs/4420%20-%20Practicum/Season%20Instructional%20Materials/Badminton/Administration%20Materials/Code-of-Conduct-for-PE.pdf

National Association of State Boards of Education. (2013). State school health policy database. Retrieved from http://www.nasbe.org/healthy_schools/hs/map.php

National Initiative for Children's Healthcare Quality. (2010). *Healthy lifestyles in Habersham County, Georgia*. Retrieved from https://dl.dropboxusercontent.com/u/19550741/Georgia/GA_Habersham_factsheet.pdf

National Research Council (US), & Institute of Medicine (US). (2004). *Children's Health, the nation's wealth: Assessing and improving child health.* Washington, DC: National Academies Press.

Ogden, C., & Carroll, M. (2010). *Prevalence of obesity among children and adolescents: United States, trends 1963-1965 through 2007-2008*. Retrieved from http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm

Oxford Dictionary. (2012). Epidemic. Retrieved from http://oxforddictionaries.com/definition/American_english/epidemic?region=us?q=epidemic

Parcel, G. S., & Baranowski, T. (1981). Social learning theory and health education. *Health Education*, *12*(3), 14-18. http://dx.doi.org/10.1080/00970050.1981.10618149

PECentral.org. (2015). *Teaching tips for beginning PE teachers*. Retrieved from www.pecentral.org/climate/teachingtips.html

Pelone, F., Specchia, M., Veneziano, M. Capizzi, S., Mancuso, A., ... de Belvis, A. (2011). Economic impact of childhood obesity on health systems: A systematic review. *Obesity Reviews*, *13*(5), 431-440. http://dx.doi.org/10.1111/j.1467-789x.2011.00968.x

PHIT America. (2013). New research: PE ignites sports participation outside of school. Retrieved from www.phitamerica.org/News_Archive/PE_Ignites_Sports_Participation.htm

Plowman, S. A., & Meredith, M. D. (2014). *FITNESSGRAM/ ACTIVITYGRAM reference guide.* Dallas, TX: The Cooper Institute.

Powell, K. E., Roberts, A. M., Ross, J. G., Phillips, M. A., Ujamaa, D. A, & Zhou, M. (2009). Low physical fitness among fifth- and seventh-grade students, Georgia, 2006. *American Journal of Preventative Medicine*, *36*(4), 304-310. http://dx.doi.org/10.1016/j.amepre.2008.11.015

Privitera, G. J. (2013). *Research methods for the behavioral sciences*. Thousand Oaks, CA: SAGE Publications, Inc.

Richards, K., Fuddy, L., Greenwood, M., Pressler, V., Rajan, R., Lowery, T., ... Irvin, L. (2013). The childhood obesity task force (ACT 269): Recommendations for obesity prevention in Hawai'i. *Hawai'i Journal of Medicine & Public Health*, *72*(3), 102-106. Retrieved from www.ncbi.nlm.nih.gov/pmc/articles/PMC3602950/

Rink, J., Hall, T., & Williams, L. (2010). The role and responsibilities of the physical education teacher in the school physical activity program. In Quinn, S., Feld, M., Brito, R., & Sexton, J. (Eds.), *Schoolwide physical activity: A comprehensive guide to designing and conducting programs.* Retrieved from http://www.humankinetics.com/excerpts/excerpts/the-role-and-responsibilities-of-the-physical-education-teacher-in-the-school-physical-activity-program

Royal College of Psychiatrists' Faculty of Child and Adolescent. (2008). Obese and overweight teenagers more likely to have considered suicide. Retrieved from http://www.medicalnewstoday.com/releases/121972.php

Ruxton, G. D., & Neuhäuser, M. (2010). When should we use one-tailed hypothesis testing? *Methods in Ecology and Evolution*, *1*, 114-117. http://dx.doi.org/10.1111/j.2041-210x.2010.00014.x

Sather, B. (2009). *Common mistakes by PE teachers*. Retrieved from http://www.unicommons.com/subjects/physical-activity/pedogogy/common-mistakes-pe-teachers

Shaya, F. T., Flores, D., Gbarayor, C. M., & Wang, J. (2008). School-based obesity interventions: A literature review. *Journal of School Health*, *78*(4), 189-196. http://dx.doi.org/10.1111/j.1746-1561.2008.00285.x

Shofan, Y., Kedar, O., Branski, D., Berry, E., & Wilschanski, M. (2011). A school-based program of physical activity may prevent obesity. *Journal of Clinical Nutrition*, *65*(6), 768-770. http://dx.doi.org/10.1038/ejcn.2011.25

Singh, G. K., Siahpush, M., & Kogan, M. D. (2010). Rising social inequalities in U.S. childhood obesity, 2003-2007. *Annals of Epidemiology*, *20*(1), 40-52. http://dx.doi.org/10.1016/j.annepidem.2009.09.008

Skinner, B. F. (1953). *Science and human behavior.* New York: MacMillan.

Spruijt-Metz, D. (2011). Etiology, treatment, and prevention of obesity in childhood and adolescence: A decade in review. *Journal of Research on Adolescence*, *21*(1), 129-152. http://dx.doi.org/10.1111/j.1532-7795.2010.00719.x

Steglin, D. A. (2008). Children, teachers, and families working together to prevent childhood obesity: Intervention strategies. *Dimensions of Early Childhood*, *36*(1), 8-15. Retrieved from http://southernearlychildhood.org/upload/pdf/Children_Teachers_and_Families_Working_Together_to_Prevent_Childhood_Obesity_Dolores_A_Stegelin_Vol_36_No_1.pdf

Thompson, D., Edelsberg, J., Colditz, G. A., Bird, A. P, & Oster, G. (1999). Lifetime health and economic consequences of obesity. *Archives of Internal Medicine*, *159*(18), 2177-2183. http://dx.doi.org/10.1001/archinte.159.18.2177

Timpka, S., Petersson, L., Rylance, R., Kedza, L., Englund, M. (2012). Performance in physical education and health impairment 30 years later- a community based cohort study. *Plos One*, *7*(4), e35718. http://dx.doi.org/10.1371/journal.pone.0035718

Torre, S. B., Akrè, C., & Suris, J. (2010). Obesity prevention opinions of school stakeholders: A qualitative study. *Journal of School Health*, *80*(5), 233-239. http://dx.doi.org/10.1111/j.1746-1561.2010.00495.x

Trasande, L., & Chatterjee, S. (2012). The impact of obesity on health service utilization and costs in childhood. *Obesity*, *17*(9), 1749-1754. http://dx.doi.org/10.1038/oby.2009.67

University of Georgia, College of Public Health. (2016). Community health needs assessment. Retrieved from http://www.habershammedical.com/fullpanel/uploads/files/habersham-chna-v5.24.2016-draft.pdf

U.S. Department of Health and Human Services. (2010). *The Surgeon General's vision for a healthy and fit nation*. Rockville, MD.

Vale, S., Santos, R., Soares-Miranda, L., Silva, P., & Mota, J. (2011). The importance of physical education classes in pre-school children. *Journal of Paediatrics and Child Health*, *47*(1-2), 48-53.. http://dx.doi.org/10.1111/j.1440-1754.2010.01890.x

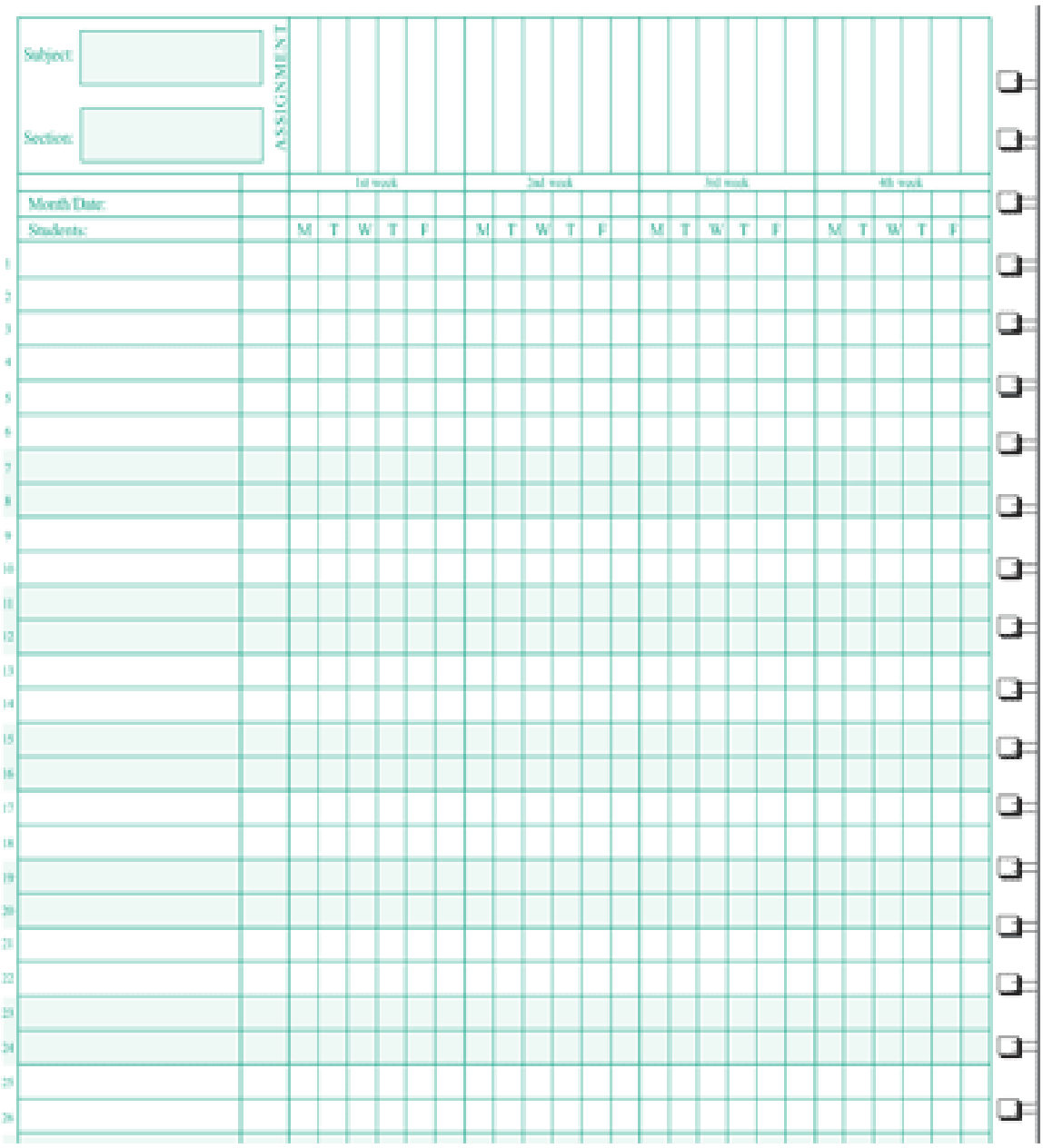
Wang, Y., & Lim, H. (2012). The global childhood obesity epidemic and the association between socio-economic status and childhood obesity. *International Review of Psychiatry*, *24*(3), 176-188. http://dx.doi.org/10.3109/09540261.2012.688195

Welk, G. J. (2008). The role of physical activity assessments for school-based physical activity promotion. *Measurement in Physical Education and Exercise Science*, *12*(3), 184-206. http://dx.doi.org/10.1080/10913670802216130

Wiersma, L. D., & Sherman, C. P. (2008). The responsible use of youth fitness testing to enhance student motivation, enjoyment, and performance. *Measurement in Physical Education and Exercise Science*, *12*(3), 167-183. http://dx.doi.org/10.1080/10913670802216148

World Health Organization (2013). *Obesity and overweight*. Retrieved from www.who.int/mediacentre/factsheets/fs311/en/#.UiNco2mlW4E.email

Appendix A: Grading Sheet



Appendix B: FITNESSGRAM Score Sheet

FITNESSGRAM Class Score Sheet

PE Teacher ____________________ Classroom Teacher ____________________

School ____________________ Grade Level ____________________

County ____________________ Assessment Date ____________________

	Name	Birthdate (mm/dd/yyyy)	Gender (M or F)	Height (ft.)	Height (in.)	Weight (lbs.)	PACER (# laps)	One-Mile Run (min: sec)	Curl-Ups (#)	Push-Ups (#)	Back-Saver Sit & Reach (in.) Left	Back-Saver Sit & Reach (in.) Right
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