

Honors Thesis Proposal

For

Analyzing the relationship between the quality of physical education programs provided by state departments of education, and obesity incidence and physical inactivity rates of children and adolescents

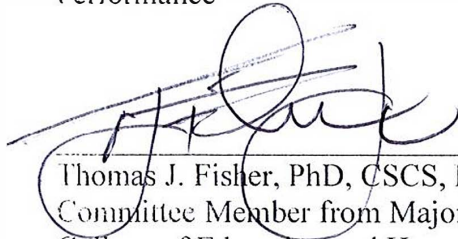
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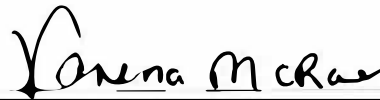
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## I. INTRODUCTION

### A. STATEMENT OF THE PROBLEM/QUESTION TO BE RESEARCHED

The following research seeks to determine the relationships between the quality of physical education (PE) programs outlined by state departments of education (DOE), obesity rates, and physical activity (PA) levels. Interest for this study came from the lack of physical activity in society and how its close connection with obesity has affected the health of today's children. Schools and the quality of their physical education programs were included in the study due to their importance in the community and in the lives of children.

The purpose of this study is to increase awareness to thoroughly implement policy to elevate the quality of PE programs in contrast to merely listing recommended guidelines or suggestions. In addition, the results of this study will highlight the individual guidelines where state DOE PE programs excel or fall short in quality. It is intended for parents, teachers, administrators, and students to recognize the assessment of their state policies and advocate to modify their policies and to better serve the health of their students.

The study is careful to only include the 2011 statistics on obesity incidence for 10-17 year olds and physical inactivity for 2011. Although there are more recent statistics on physical activity and inactivity, obesity incidence in 2011 is the most recent recorded for children ages 10-17. Information on school PE programs since 2011 were still included in the analysis; however, the small amount of policy that has been implemented since 2011 was considered minuscule and wouldn't affect the results. Other obesity and physical activity statistics specific to special populations including those considered low socioeconomic status and different ethnicities were not included in the study. Only the ten states with the highest and lowest percentages in

obesity and PA (potentially 40 states total) were chosen to have their statistics and state DOE PE program and PA efforts reported and assessed.

The target population for this study includes everyone involved in the life and health of children including but not limited to parents, administrators, teachers, students, doctors, and government officials. The overall purpose of this research is to improve the health of children through school policy, therefore the goal of this research is to make the conclusions of this data understandable to everyone involved and applicable to the realistic evaluation and improvement of school programs.

## **B. REVIEW OF THE LITERATURE**

### **Obesity: Rates, Prevalence, Incidence**

Obesity has become an epidemic in the United States at the same time that physical activity is at an all time low. Ogden et al. (2012) reported 16.9% of children and adolescents ages 2-19 were obese in 2009-2010 and 31.8% were either overweight or obese. In addition, their study reported 12.1%, 18.0%, and 18.4% obesity prevalence for children ages 2-5, 6-11, and 12-19 respectively. The later data is more concerning because it notes an increase in obesity prevalence with age, indicating that as people become older and perhaps busier, they participate in less physical activity or inherit unhealthy habits that lead to an increase in weight and obesity.

Regarding obesity incidence, Cunningham et al. (2014) published that obesity incidence was 14% annually for overweight children- meaning every year, 14% of the children who are overweight will become obese. This study described a pattern seen in their data that the obesity



incidence for children who were overweight commonly occurred early in elementary school and that obesity incidence for children who entered elementary school at a normal weight was significantly less than those who entered overweight. Another concerning statistic published by Cunningham (2014) states that by kindergarten, 12.4% of children in America are obese and 14.9% are overweight; considering the previous information, this means every year of elementary school, 14% of the 14.9% of students who are already overweight will become obese, a pattern which continues to increase the overall prevalence of obesity.

Data from the National Survey of Children's Health (NSCH) has documented the obesity rates by state for 2003, 2007, and 2011, which demonstrates no decrease in obesity levels from 2003. The CDC reported on the NSCH data and determined that overall rates and prevalence for both children and adults has not changed significantly. The continued rise and/or plateau of obesity amongst a society that is seemingly aware and putting forth efforts to combat the disease is concerning and descriptive of what may be ineffective policies or efforts. The ineffective efforts of society could be wasting money and resources without substantial results and thus is reason for more research to be done on assessing and evaluating such programs.

### **Obesity: Related Conditions**

While obesity alone is a terrible disease, there are multiple other health conditions and diseases that are correlated to obesity. Increased risk for hypertension and increased cholesterol levels were reported in the US Bogalusa Heart Study on obese adults. In addition, obese children were susceptible to even more conditions including type 2 diabetes, menstrual irregularities, steatohepatitis, asthma, musculoskeletal disorders, and psychological problems (Lakshman

2012). The CDC also lists heart disease, stroke, and some types of cancers as obesity-related conditions (CDC obesity data).

Type 2 diabetes is one of the most common obesity-related diseases; the Canadian Journal of Diabetes states there is an "urgent and increasing need... to invest in research ...to prevent and treat obesity and to encourage physical activity" (Canadian Journal of Diabetes 2013). The journal also describes the close relationship of metabolic syndrome and type 2 diabetes, correlating both diseases with obesity. Type 2 diabetes shares a lot of the same causes as obesity, but can cause your body to attack itself and end up an expensive and fatal disease if not treated properly. The process of treating and maintaining body function with type 2 diabetes can be very tedious and difficult for a child to properly administer, thus making obesity and type 2 diabetes extremely dangerous for a child to endure.

### **Physical Activity: Benefits and Role in Obesity Prevention**

As mentioned before in the Canadian Journal of Diabetes (2013), there is a strong need for governments to invest in research to create effective strategies for the purpose of not just obesity prevention but also to encourage physical activity. Physical activity plays a large role in the health of people, particularly in keeping a health weight, increasing bone density, and developing motor function in children. (Kushner & Bessesen, 2007) explains in the book, "Treatment of the Obese Patient," how physical activity is involved in the prevention and treatment of obesity. Although there is little data that supports significant correlation between PA alone and the reduction or prevention of obesity, the association of PA in the reduction of weight gain and prevention of other obesity-related diseases has been published; therefore this research recognizes PA as a method to aid in obesity prevention and reduction (Dwyer-Lindgren et al.

2013). Specifically with children and adolescents, decreasing sedentary behavior and increased PA can combat weight and fatness gains (Must & Tyber 2005). Independent of weight gain, other benefits of PA include decreased risk for cardiovascular disease and some cancers, increased bone and muscle strength, and improved mental health ("The Benefits of Physical Activity" 2015).

## **School Interventions/Programs**

### **Need for school intervention/programs**

Combining what is known about the rise and danger of obesity and sedentary behavior along with the role of PA in health, adequate physical education should be provided in schools to educate children on the issues associated with unhealthy behaviors and how they can participate in a lifestyle of healthy behavior. Due to the high amount of time U.S. children spend in schools, it is the ideal place to implement intervention strategies to prevent obesity and encourage participation in PA. Research involving PA and the school environments has recently recognized multiple intervention strategies that have proven beneficial and realistic in preventing obesity (Waters et al. 2011). Lakshman, Elks, and Ong (2012) also discusses the reported success of school-based intervention for obesity with the most promising interventions including PA.

In addition, research on obesity incidence has discovered that by age 5 a component of the course to obesity is already established, indicating the need implement and teach healthy behaviors early in educational settings (Cunningham et al. 2014). Buscemi et al. (2015) also published on the impact of early care and education policies among preschool-aged children; the statement mentions the need to address obesity prevention at a young age in early childcare settings, and mentions the importance of physical activity for other health benefits such as motor



development. It is clear that education has the greatest impact on children while they are in elementary school and early child care settings, but this is not the only time intervention, education, and PA should be offered to children. Lakshman, Elks, and Ong (2012) describes there is an increased risk for adolescents and children who are obese to continue to stay obese into the adult years, compared to normal weight teenagers who had less than a 5% chance of becoming obese. This means even after elementary and middle school, the weight of a teenager entering and during high school is often the weight they will stay at during adulthood. In order to make effective efforts decreasing obesity prevalence, high school programs should be just as involved if not more in teaching and providing PA opportunities and health education.

### **School Evaluation and Assessment**

Having the knowledge that obesity is bad, physical activity is good, and schools should include programs to prevent obesity and encourage PA is not nearly enough to make a serious effort in improving the health of children. Despite the inconsistency of the new and evolving analysis techniques used to evaluate health and/or PE programs, Lytle et al. (2002) published an article comparing various intervention strategies and their evaluations, studying the United States and European countries. One particular intervention in Crete was notably successful and included a high degree of parental participation, a health education program that included physical education classes that reported longer intervention hours than provided in American interventions, and a high level of teachers' compliance. Particular emphasis was granted to the length of interventions in how effective a school is at promoting health education as well as the length of a study that evaluates such programs. In addition, the approach to teaching a child should be considered before implementing a PE or health program. Maziah, Nooraziah, and Saemah (2015) reported the best teaching tool to educate young children (elementary-aged) on

PA includes child-friendly concepts that incorporate the child's surrounding environment and conceptual play activities. While this may seem obvious, current guidelines and/or mandates do not include this kind of detail in all states and thus is the reason why evaluation and assessment measures should be implemented and monitored.

Part of the current issue today is that too many school districts and DOEs are adding in PE programs or encouraging students to participate in PA just for show, but the true quality and effectiveness of the programs and efforts reveal poor quality and little outcome. Obesity has been on the rise since the early 2000's and current statistics report some states having up to 21.7% of children categorized as obese- not including those who are overweight ("Childhood Overweight and Obesity Trends" 2003, 2011). The CDC also reports that in 2013, only 29% of high school students attended PE class daily and 27.1% participated in the recommended amount of PA all 7 days prior to being surveyed. There is no doubt that evaluation and modification of current PE programs and DOE efforts to provide PA opportunities to students is necessary to seriously combat obesity and its related problems ("Physical Activity Facts" 2015).

### **Importance of Research**

Not only is society making little to no progress on decreasing prevalence, but tons of money and resources are also being spent on obesity awareness and programs that aren't showing promising results. Without quality programs with clear requirements and guidelines appropriate to the age group, society may get too comfortable with the trend of supporting obesity without efficiently and seriously working to fight the disease. Research on evaluation, assessment, program modification, and proper program development are necessary to actually make progress on this issue. Proper research and change can not only decrease obesity prevalence and increase



PA in children and adolescents but also decrease health care costs, decrease emotional stress on children who are constantly combating their obesity related diseases without any results, and increase the overall quality of children's lives by increasing their health through physical activity.

## **Data Collection Methods**

### **Subjects**

The population this study is focused on observing is children and adolescents, 10-17 years old. Obesity rates will be recorded for children ages 10-17; however, there is no recorded physical inactivity data for 10-17 year-olds per each state in the year 2011, so data for physical inactivity is collected for the state in general. Both obesity rates and PA rates are reported for the year 2011.

### **Instruments**

Computers were used to gather information regarding the various school PE programs and PA efforts from the websites of each state DOE. Statutes, Bills, Rules, Regulations, Standards, and Guidelines provided by the state DOE website were included in each state's assessment of their PE program.

A quantitative assessment of each state DOE was performed with a rubric. The rubric used for assessment was derived from the Let's Move Assessment Tool and modified with guidelines from the CDC in order to better assess the state DOE as a whole rather than each individual school (Table 1). The rubric listed nine guidelines and allowed a score from zero to three, three meaning all criteria was met for the guideline and zero meaning the guideline was

not met at all or there was no PE program to assess. The highest score possible on the assessment is 27 total points.

Mention the instruments used for statistical analysis and tests for significance once determined.

## **Procedures**

All data involving obesity rates and physical inactivity/activity are representative of the year 2011. Obesity rates for 10-17 year-olds were recorded from the State of Obesity Organization website. Only the ten states with the highest obesity rates and the ten states with the lowest obesity rates had their obesity rates recorded. Physical inactivity rates for the entire state were recorded for the ten states with the highest physical inactivity and the ten states with the lowest physical inactivity.

After obesity and physical inactivity data was recorded, each state's DOE PE programs and PA efforts were assessed. Information for each state's assessment came from the DOE website and any statute, code, bill, regulation, rule, standard, or guidelines was included in the assessment. It is important to note that information that was not described as "required" or "mandated" was still considered for assessment and regarded as part of the DOE's effort to increase PA. There is variability between each state DOE website and how policies are documented and published for the public to find; it is important that the researcher does a thorough job looking for every piece of information to properly assess the state to the best of their ability.

Once all data was collected from the assessment, relationships were considered between obesity and physical inactivity rates of each state and their scores on the assessment.

### III. Analysis of Data

Table 2. States with ten highest obesity rates for 10-17 year-olds

State	Mississippi	South Carolina	District of Columbia	Louisiana	Tennessee	Arkansas	Arizona	Kentucky	Illinois
Obesity Rate	21.7%	21.5%	21.4%	21.1%	20.5%	20.0%	19.8%	19.7%	19.3%

Table 3. States with the ten lowest obesity rates for 10-17 year-olds

State	Oregon	New Jersey	Idaho	Wyoming	Colorado	Washington	Vermont	Hawaii	Utah
Obesity Rate	9.9%	10.0%	10.6%	10.7%	10.9%	11.0%	11.3%	11.5%	11.6%

Table 4. States with the ten highest physical inactivity rates

State	Mississippi	Tennessee	West Virginia	Louisiana	Alabama	Oklahoma	Arkansas	Kentucky	Indiana
Physical Inactivity Rate	36.0%	35.2%	35.1%	33.8%	32.6%	31.2%	30.9%	29.4%	29.3%

Table 5. States with the ten lowest physical inactivity rates

State	Colorado	Utah	California	Oregon	District of Columbia	Vermont	Hawaii	Idaho	Minnesota
Physical Inactivity Rate	16.5%	18.9%	19.1%	19.7%	19.8%	21.0%	21.3%	21.4%	21.8%



Rate									
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Table 6. Total scores of state assessment

State	Total
Mississippi	17
South Carolina	16
New Jersey	23
Oregon	22

Figure 1. State assessment score by guideline

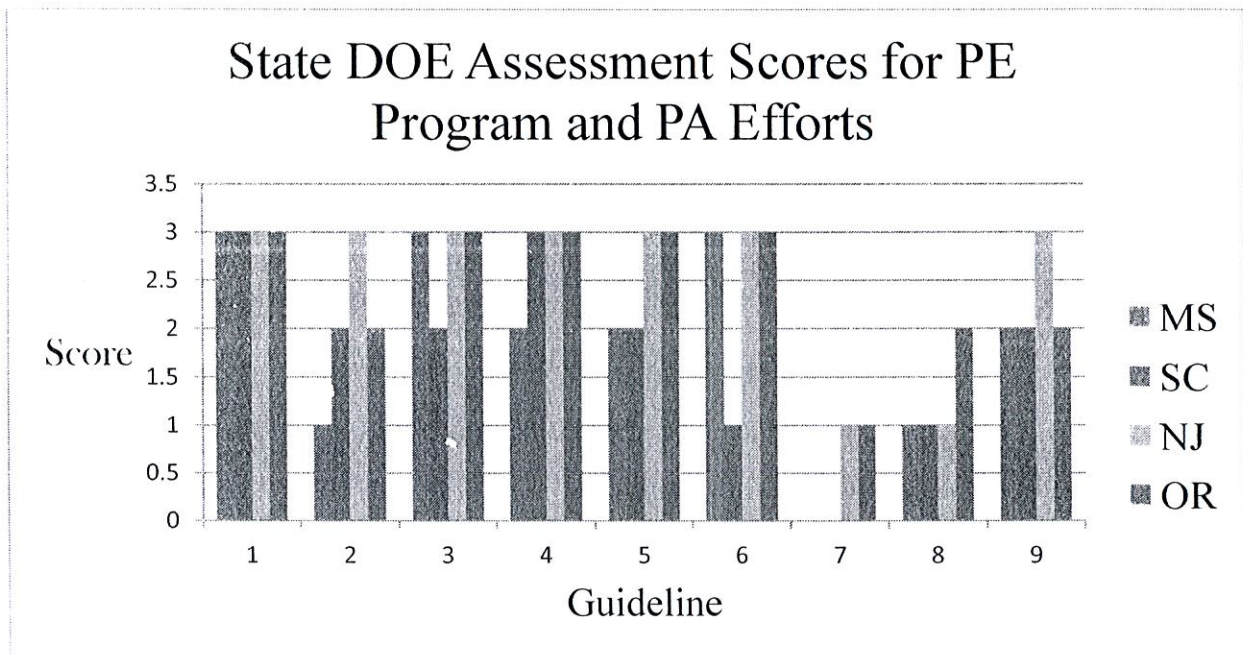
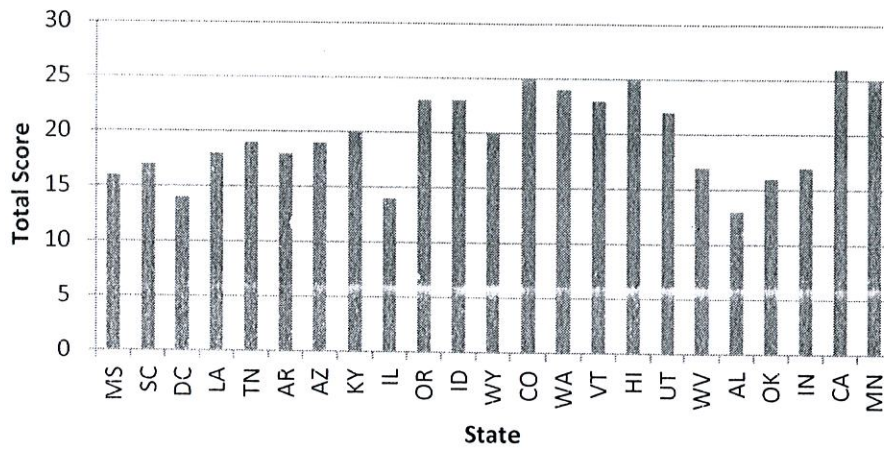


Figure 2. Total assessment score for each state

## Total assessment score for each state



## Appendix

Table 1. Assessment Rubric

Guidelines	3	2	1	0
ES: 150 minutes of physical education per week.	150 minutes per week	90-149 minutes per week	60-89 minutes per week	Fewer than 60 minutes per week
MS/HS: Years of required physical education	The equivalent of all academic years of PE (or 225 minutes per week)	The equivalent of at least one academic year but less than all academic years of PE	The equivalent of one-half academic year of PE	The equivalent of less than one-half academic year of PE, or no PE requirement at all
All PE teachers use an age-appropriate, sequential PE curriculum that is consistent with national or state standards for PE	All PE teachers use the sequential curriculum that is consistent with national or state standards	Some use a sequential PE curriculum, and it is consistent with state or national standards	Some use a sequential physical education curriculum, but it is not consistent with state or national standards	None do, or the curriculum is not sequential, or there is no PE curriculum
PE program	All 3	2 of the	1 of the	None of the



integrates components of the Presidential Youth Fitness Program or an equivalent	components	components	components	components
*Does the PE program use appropriate practices to include students with special health care needs	4-5 components are included	2-3 components are included	Only 1 component is included	No PE program or special needs program is offered
**School promotes or supports walking and bicycling to school in the following ways	5-7 of the recommended ways to involve walking or bicycling to school are used	3-4 of the recommended ways to involve walking or bicycling to school are used	1-2 of the recommended ways to involve walking or bicycling to school are used	None of the suggested ways to support walking or bicycling to school are used
***DOE supports /encourages PA before and/or after school through the following	The DOE supports /encourages 5-7 of the recommended	The DOE supports /encourages 3-4 of the recommended	The DOE supports /encourages 1-2 of the recommended	None of the recommended before or after school activities are supported or

recommendations	before/after school activities	before/after school activities	before/after school activities	encouraged by the DOE
ES: Students are provided at least 20 minutes of recess during each school day	20 minutes of recess is provided each school day	Recess is provided each day but for less than 20 minutes	Recess is provided but the amount of time and days required vary by district	Recess is not provided or required
****PE program uses methods to promote student participation in a variety of community PA options	All 4 recommended community PA opportunities are supported	2-3 recommended community PA involvement opportunities are supported	1 of the recommended community PA involvement opportunities are supported	There is no PE program or the DOE does not encourage/support PA in the community

\*Components of addressing special health care needs

- Students with special needs are still required to participate in PE program
- Students with chronic health conditions are still required to participate in PE program
- Modify PE programs to the individual with special needs or health conditions
- Require schools to have adapted PE equipment and/or facilities
- Use a second teacher, aide, physical therapist, occupational therapist, or other professional to assist with modified program

\*\*School supports walking and/or biking to school in the following ways:

- Safe routes are provided by the department of education, department of health, or department of transportation;
- The DOE provides resources about other organization that provide safe routes
- Participation in promotional activities such as International Walk to School Week, National Walk and Bike to School Week, etc.
- Secure storage facilities for bicycles and helmets are provided by the school
- Instruction on walking/biking safety is provided to students
- Walking school buses and other alternate transportation services that involve PA are encouraged and supported by the DOE
- Creation and/or distribution of maps around the school are provided by the DOE

\*\*\*Recommended before and after school activities (CDC comprehensive school physical activity programs: a guide for schools)

- Walking and biking to school program
- Physical activity clubs and intramural programs
- Informal recreation or play on school grounds
- Physical activity in school-based child care programs
- Integrating physical activity in homework during out of school hours
- Interscholastic sports
- Can be coordinated with community-based organizations

\*\*\*\*Opportunities to promote student participation in community PA



- The DOE is connected with community organizations to provide before/after school activities
- Interscholastic sports are offered to engage students with other schools in the community
- School facilities are open to community programs that allow student participation in PA
- The DOE lists community resources/facilities that allow student participation and PA

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