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# The Lack of Physical Activity in Children and the Associations with Childhood Obesity: An Overview of the Causes, Effects and Implications

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Running head: CHILDHOOD OBESITY

**The Lack of Physical Activity in Children and the Associations with Childhood Obesity:**

An Overview of the Causes, Effects and Implications

Kristen LeMay

Merrimack College

May 2012

A capstone project presented to the faculty of the Graduate School of Education

In the Community Engagement Program at Merrimack College

In partial fulfillment of the requirements for the degree of a

Master's in Education

**Acknowledgements**

I would like to dedicate this paper to the many people who have been with me throughout the year on my journey through this Master's Program at Merrimack College. I've had a very influential experience this past year and I wouldn't have been able to make it through without the help and support of my family, friends, peers, professors, and mentors.

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To my family and friends: I want to thank all my family and friends for being supportive of me and always being there for me when I needed to talk or vent. There have been many times this year when I was stressed out and just wanted to give up, but it was the positive, motivational comments I received from my family and friends that helped get me through the challenging times over the course of the year.

Thanks again everyone and I hope you enjoy reading this paper, as much as I enjoyed writing it!

## Executive Summary

For the capstone project, this paper will explain specific questions relevant to community engagement and the author has done extensive research to answer these questions in an extensive literature review of these findings. The fellowship experience this past year has been an amazing inspiration, and the author of this paper decided to link their experiences from this to the capstone. The childhood obesity epidemic, which is rampant in our society today, is the overarching topic of this capstone project.

### Areas of Research

Research Questions: What is the definition of obesity? What are the causes and effects of childhood obesity? Why are children today much more obese than in the past? What can be done in the near future to prevent childhood obesity? What are some recommendations for change?

There are two paths with extensive research that the author could have taken as an approach to this topic: children's nutrition or children's physical activity. The capstone paper will include a little bit of both, but is mainly focused on the issue of the amount of physical activity children in our society are getting on any given day, and the factors affecting this.

### General Overview

Childhood obesity has more than tripled in the past thirty years in the United States, while educational performance has decreased among the world rankings. There has now been an emphasis on personal fitness and education must be implemented on today's youth in order to

promote a healthier, educated population. This paper will seek to describe the main causes and effects of childhood obesity, while explaining the detrimental health risks, as well. There will be a general overview of the history of physical education in the United States from the very beginning up until today, to show how much it has decreased in school systems across the nation. There will also be a description of the trends in socioeconomic status, ethnicity, and the media, explaining some of the negative effects they have on children's physical activity.

The implications section will present initiatives that have been created to help prevent the problem of childhood obesity. Michelle Obama's "Let's Move" initiative, the NFL's "Play60," Dr. Kyle McInnis and Professor Kevin Finn's Active Achiever's program, and a proposal for a new initiative will be discussed. Correspondingly, changes in governmental regulations in school systems regarding childhood obesity will appear in this section as well.

The limitations of the research and areas that need more data collection or significant results will be included towards the end, and the conclusion will wrap up the findings of the entire capstone paper.

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The Lack of Physical Activity in Children and the Associations  
with Childhood Obesity: An Overview of the Causes, Effects and Implications

Researchers have recently noted that childhood obesity has become a major epidemic in the United States today. The United States has one of the highest rates of overweight and obesity in the world, ranking in the top three. Recent national data shows that 16% of U.S. children are obese (Sacheck & Clark, 2008). From 1980 to 2004, the prevalence of overweight and obesity in children has more than tripled, rising from 5% to 15% (ACSM, 2005). The percentage of children aged 6–11 years in the United States who were obese increased from 7% in 1980 to nearly 20% in 2008. Similarly, the percentage of adolescents aged 12–19 years who were obese increased from 5% to 18% over the same period (CDC, 2011).

The health and well-being of children across the U.S. is being threatened because of this issue. One of the leading causes of this significant increase in weight among children and adolescents is that there is an excess of caloric intake compared with calorie expenditure (Wechsler, McKenna, Lee, & Dietz, 2004). Along with their unhealthy eating habits, children are not getting enough physical activity. According to the Center for Disease Control, children should be getting at least sixty minutes of physical activity a day (2011). However, despite the many health benefits associated with regular physical activity, countless children and adolescents do not participate in physical activity for sixty minutes or more each day (CDC, 2011). There are many factors, such as: a lack of physical education in schools, a family's socioeconomic status, the role of the child's parents, and the role of the media and technology, that may be the underlying causes of the childhood obesity epidemic and each will be discussed further throughout this paper.

### *Methods*

This literature review was composed in order to show the dramatic change in physical activity in today's youth, compared to the past, but also to display the facts regarding why obesity is a major problem in today's society. The paper will focus on answering each of the following research questions: What does it mean to be obese? What are the causes and effects of childhood obesity? Why are children today much more obese than in the past? What can be done in the near future to prevent childhood obesity? What are some recommendations for change?

The literature found throughout this paper was extensively researched using Google Scholar. The Center for Disease Control and Prevention and the American College of Sports Medicine were two websites with comprehensive data that were used throughout this paper. In order to gain information and knowledge on the topics discussed in this literature review, some of the various themes that the author searched were, "childhood obesity," "childhood obesity and physical activity," "childhood obesity and socioeconomic status," "childhood obesity and the role of the media," "childhood obesity and the role of technology," "physical education in school systems across the United States," and "physical education and academic enhancement." Based on the research, there will be a proposal for change included at the end of the literature review. By using the websites mentioned above, along with searching the previously mentioned terms into Google Scholar, the author was able to produce an exemplary overview of the childhood obesity epidemic in the United States.

### *History of Physical Education in Schools*

There has been a drastic change in the prevalence of physical education programs in American schools beginning in the 1700's up to the year 2012. Originating in the late 1700's,



physical education was first introduced to the United States by three countries: Germany, Sweden, and England (Boyce, 2001). German immigrants conveyed the fitness aspect of physical education to Americans by pioneering the first gymnastic training routines, such as the side horse, parallel and horizontal bars. The Swedes brought a different approach to the table, engaging Americans in a system of exercises that promoted health through various movement patterns. The English had their own way of doing things, as well, as they stressed the importance of moral development through the participation in numerous sports and games (Boyce, 2001). Germany, Sweden, and England each had very different philosophies, but they were all utilized in the creation of the physical education program in the United States. These three countries greatly influenced America's physical education initiative, and the U.S. adopted ideas from each of them, which later became the foundation for the physical education program in the United States.

The 1800's marked the first point where physical education was included in schools across America. The Round Hill School, a private school established in 1823 in Northampton, Massachusetts, was the first to include physical education as a part of the curriculum (Boyce, 2001). Due to the European influence, physical education programs consisted of a series of structured exercises that children could perform in the classroom. Then, one year later, in 1824, Catherine Beecher, who was an advocate of promoting the inclusion of daily physical education in public schools, incorporated calisthenics in her school's curriculum becoming "the first American to design a program of exercise for American children" (Lumpkin, p. 202). A combination of games and calisthenics evolved and became the first scheduled physical education activity offered in some U.S. schools (Lee, 1983).

Throughout the 1800's and into the early twentieth century, physical education became very popular in American schools. Several educational psychologists, including John Dewey, supported the idea that physical activity played an important role in a child's ability to learn and develop. Dewey was an instrumental leader of the American education system in the twentieth century (Finn, 2012). He was well known for his support of integrating physical activity into learning and therefore was supportive of teaching games and sports in school (Dewey, 1944). Dewey argued that physical education contributed to the physical well-being of children, as well as to their social, emotional, and intellectual development (Dewey, 1944). Many educators came to realize that physical education not only benefitted the health and well-being of children, but it also assisted in the development of moral reasoning skills, which is why it became a significant component in schools across the United States. None of this evolution would have been possible without the influences of Germany, Sweden, and England, who propelled the United States in this direction. Because of this, in the 1920's, many states began passing laws requiring physical education in schools (Boyce, 2001).

The United States went through some difficult times in the early 1900's, with the Great Depression occurring and the various wars. The changes that transpired in society at this time were reflected in the physical activity programs because throughout World War II, the emphasis in physical education shifted from games and sports to physical conditioning, in order to prepare the nation's youth for combat (Boyce, 2001). By 1950, the President's Council of Physical Fitness had been created because there was a study done by Kraus-Weber, showing that American children were far less fit than European children (Boyce, 2001). The President's Council of Physical Fitness' mission, which is still in place today, is "to engage, educate and

empower all Americans across the lifespan to adopt a healthy lifestyle that includes regular physical activity and good nutrition” (PCFSN, 2012).

Today, many physical education programs emphasize overall fitness, which is often times referred to as wellness, as well as skill development (Finn, 2012). However, since the 1970’s the number of schools offering daily physical education has drastically decreased. Statistics from the Center of Disease Control (1995) show a major drop in daily physical education in schools across the United States, from 43% in 1991 to 25% in 1995. During the past decade, the number of U.S. high school students attending daily physical education classes dropped from 42% to 29% (Villaire, 2012). According to a study done by Lee, Burgeson, Fulton, & Spain in 2006, few schools were found to provide daily physical education for students in all grades in the school for the entire school year. The researchers found that 3.8% of all elementary schools, 7.9% of all middle schools, and 2.1% of all high schools provided daily physical education for students for the entire school year (Lee, et al., 2006).

#### *Physical Education in Schools Today*

Currently, many schools are faced with the challenge to improve standardized test scores in Mathematics, English, and Science. There is a constant pressure on teachers to prepare their students for tests, such as the MCAS or the SAT’s, which means that there is a generalized focus in these content areas (Finn, 2012). Because of this, physical education, recess, and physical activity breaks have been reduced and in some cases have been totally eliminated. In 2007, only 53.6% of U.S. high school students reported that they attended physical education class at least one day per week and less than 30% indicated that they participated in daily physical education (CDC, 2007). In 2006, only 57% of elementary school districts required schools to provide recess for students. According to Lee et al. (2006), only 16% of school districts required

elementary schools, 10% required middle schools, and 4% required high schools to provide regular physical activity breaks for students.

According to the National Association for Sport and Physical Education (NASPE), the nation's largest organization for physical education teachers, nearly half of all students and 75% of high school students do not attend any physical education classes (2009). Judith Young, who is the executive director of NASPE, asserts that schools cut gym classes for lack of funding, but these cuts can also result from time constraints that develop with the addition of new curriculum (2009). There has been a recent push for higher educational standards and in harsh economic times, physical education may be the first to go (Villaire, 2012). Unlike in the past, structured physical activity and physical education class is not as prominent in schools, which may be one of the leading factors in the childhood obesity epidemic.

#### *What is Obesity?*

According to the Center for Disease Control and Prevention, overweight is defined as “having excess body weight for a particular height from fat, muscle, bone, water, or a combination of these factors” (2011). Having a BMI at or above the 85th percentile and lower than the 95th percentile of the same age and sex classifies a child as overweight. The CDC defines obesity as “having excess body fat.” When a child has a BMI at or above the 95th percentile of the same age and sex, he/she is obese (CDC, 2011). A person whose weight is 20% or more above normal weight is considered obese, and unfortunately many children fall into this category. According to the American College of Sports Medicine, when a person consumes more calories than they are expending, this creates an energy imbalance, which causes people to become overweight and obese (2005). Therefore, when children are living a very sedentary lifestyle and not expending enough energy, to burn the excess calories through some form of

physical activity, this leads to an increased fat storage in the body (ACSM, 2005). Childhood obesity has become a major problem in the United States in the past few years. Researchers have come to the conclusion that there is now a generation of children who might not outlive their parents due to overweight and obesity, unless the trend is reversed (ACSM, 2005).

### *Health Risks*

Overall, being obese is not healthy. Poor nutrition and a lack of physical activity, along with other factors can cause a person to become obese. Not only can obesity affect a person's physical health, it can negatively impact their social, behavioral, and mental health, as well (Argon, Berends, Ellis, & Gonzalez, 2010). Obesity greatly affects children's health with complications that could lead to: high cholesterol, high blood pressure, type 2 diabetes, cardiovascular disease, sleep apnea, and orthopedic problems. In addition, psycho-social problems such as low self-esteem and teasing from peers can cause lifelong damage to children (ACSM, 2005). Obese children have a high risk of developing diabetes and cardiovascular disease when compared to children of normal weight (Sacheck & Clark, 2008). Overweight and obese children are also more likely to become overweight and obese adults. The odds of becoming an obese adult more than double for children under ten years old with one or more obese parents (Sacheck & Clark, 2008). When both parents are obese, the children have an 80% chance of being obese.

There are medical disorders that can cause obesity, but less than 1% of all obesity is caused by physical problems (AACAP, 2011). Some of the causes of childhood obesity include: poor eating habits, overeating or bingeing, lack of exercise, family history of obesity, medical illnesses (endocrine, neurological problems), medications (steroids, some psychiatric medications), stressful life events or changes (separations, divorce, moves, deaths, abuse), family

and peer problems, low self-esteem, and depression or other emotional problems (AACAP, 2011). Overweight adults can develop all of these same types of diseases and risk a high rate of mortality from the diseases.

It can be very stressful for a child to go through life being obese. There are not only health issues, but social issues, such as getting made fun of at school, having no friends, or not being physically able to participate with other peers during recess. Overweight and obese children are often targets for discrimination (Let's Move, 2010). The psychological stress of social stigmatization can cause low self-esteem which can also affect academic functioning (Let's Move, 2010). While research is still being conducted, there have been some studies done showing that obese children are not learning as well as those who are not obese (Let's Move, 2010).

On top of all the other health issues that can occur from being obese, stress can take a toll on the body. Having too much stress in life is not healthy, because stress causes a biological reaction, which turns on the sympathetic nervous system (Feldman, 2008). When certain stress hormones like cortisol, epinephrine, and norepinephrine are secreted by the adrenal glands, this causes a rise in heart rate, blood pressure, respiration rate, and sweating (Feldman, 2008). In his 2008 textbook, Feldman describes how with the continuous exposure to stressors, the body becomes more and more susceptible to being able to deal with stress.

There are many negative consequences of being overstressed. It has been proven that headaches, backaches, skin rashes, indigestion, chronic fatigue, and the common cold can result from being over stressed (Feldman, 2008). When the stress hormones are constantly being secreted, the heart, blood vessels, and other body tissues may deteriorate (Feldman, 2008). As a result, the immune system becomes weaker, more susceptible, and its ability to fight off germs

and infections declines. In their research, Sacheck and Clark found that severely obese children have been shown to be absent up to four times more often than healthy weight students (2008). The combination of being absent from class and being sick can lead to a decrease in academic performance and it has been shown that overweight youth have significantly lower test scores than healthy weight children (Sacheck & Clark, 2008). There are many health risks that could occur with being an obese child; however, they could all be prevented if the child ate healthy and was physically active.

### *Economic Afflictions*

Not only can obesity cause physical and mental health issues, it can create devastating economic problems. In 2000, the total cost of obesity, which included medical costs, the value of wages lost by employees who were unable to work because of illness, disability, or premature death, in the United States was a staggering \$117 billion (Wechsler et al., 2004). Health costs have skyrocketed in the past few years, which is not ideal for the future. As more and more people are becoming obese, medical costs will continue to increase. The national estimated cost for obesity-related hospitalization of children was \$127 million in 2008. Medical expenditures for overweight and obese children are \$180-\$220 more than expenditures for a healthy child. There was a study done on adolescents who were insured through North Carolina Medicaid, and their medical expenditures were 25% greater for obese adolescents and 33% for overweight adolescents, compared to those who were of healthy weight (Sacheck & Clark, 2008). People are spending large amounts of money on medical expenses now, and these costs are expected to increase with the growing prevalence of obesity in America in the future.

*Socioeconomic Status*

Socioeconomic status also plays a role in childhood obesity. The Robert Wood Johnson Foundation Center to Prevent Childhood Obesity found that low income people have a higher risk of obesity, overweight, and poor health because they are more heavily concentrated in environments that do not support healthy eating and physical activity (2007). Also, research has found that higher obesity is more prevalent among children living in poverty, on public health insurance, and among those who are Hispanic (Sacheck & Clark, 2008). In Massachusetts, a staggering 15% of children from low-income families are obese by the age of two and a half (Sacheck & Clark, 2008). Studies have shown that children living in poverty have limited access to healthy foods and greater exposure to high-calorie and fatty “junk” foods. Supermarkets are scarce in poor areas and the gap is usually filled with fast food restaurants and convenience stores (Kalanaj, 2010).

Researchers, Sacheck and Clark found that neighborhoods surrounding middle and high schools are 30% more likely to have a fast food restaurant or convenience store, which could also add to the obesity problem (2008). The availability and affordability of healthy food options is a challenge faced by people living in both rural and urban neighborhoods. In the study, residents from underserved neighborhoods in New York reported no fruit or vegetable intake in the past 24 hours (Sacheck & Clark, 2008). This type of living situation is strongly associated with poorer nutrition and higher rates of obesity and diabetes (Sacheck and Clark, 2008).

Another contributing factor to low socioeconomic status is the issue of the type of environment and surroundings that are present where the child lives. Poor areas may not be safe to go outside and play, making it very hard for children to be physically active. Often times, the environment the child is living in is not conducive for recreation, and there may not be



sidewalks, parks, or playgrounds for the child to be physically active (ACSM, 2005). An example of this type of living situation may be that there is a family of four living in a one bedroom apartment in the slums in New York City because of the sole reason that this is all they can afford. A problematic situation may arise because not only is it likely that they have little physical activity time at school (if they even attend school), but there is no space for the children to be active inside or outside their own homes. The children will continue in this vicious cycle of having a little to no physical activity day after day, and there is not much they can do about it.

Many poor cities or towns do not have the money to provide the services needed to live a healthy lifestyle. Often in these types of areas, schools lack the necessary facilities, have fewer organized sports, do not allow recess, and may have cut physical education out of the budget, which means that not only are the children inactive at home, they lack physical activity at school, as well, continuing along the cycle (Kalanaj, 2010).

Associated with low socioeconomic status, researchers have found that ethnicity is another factor that is correlated with the childhood obesity epidemic. According to the Robert Wood Johnson Foundation Center, “in every racial or ethnic group, health status improves as income increases,” (2007). Socioeconomic differences in health are related to differences in resources and opportunities that affect all racial or ethnic groups (2007). Children living below 200% of the federal poverty level are more likely to be obese, and black children are more likely to be overweight than Hispanic children, who are more likely to be obese than white children (Sacheck & Clark, 2008). It has been shown that 22.5 % of Mexican American boys, 23.2% of non-Hispanic black girls, and a significant amount of American Indian youth had higher rates of overweight (Wechsler, et al., 2004). In Sacheck and Clark’s study of childhood obesity in

Massachusetts, the researchers discovered that 45% of both low-income and Hispanic children are obese (2008).

Yoo, Lounsbury, Bungum, and Gast performed a study in 2010 to examine gender and ethnicity differences in adolescents' physical activity behavior and perceptions. There were 175 participants that completed their survey, which was designed to measure physical activity behaviors and perceptions. While no significant differences were found for vigorous physical activity between ethnic groups, there was significant differences between ethnic groups that were found for moderate physical activity, with Caucasian students being more likely to be active than Hispanics (Yoo et al., 2010). According to the Youth Risk Behavior Survey in 2005, Hispanic and African American high school students participated in vigorous or moderate physical activity at very low rates. The findings in this study correlate with the findings in the Youth Risk Behavior survey. The Hispanic population has also shown higher incidence of diabetes and is 1.5 times more likely to be obese than Caucasians (Youth Risk Behavior Survey, 2005).

As seen in the research done at the Robert Wood Johnson Foundation, more than 38% of Latino youth ages 2-19 in the United States are overweight and about 21% are obese, correlating with the fact that socioeconomic differences in health may be related to differences in resources and opportunities that affect all racial or ethnic groups (Nyberg, Ramirez, & Gallion, 2011). They also found that two of the main reasons for obesity among Latino youth are insufficient physical activity and excessive sedentary behavior. A survey conducted by the Center for Disease Control and Prevention indicated that Latino parents have more problems than white parents with transportation, neighborhood safety, and with the expense and availability of local recreational opportunities (Nyberg et al., 2011). As stated earlier, if the environment a child is living in is unsafe and there are no recreational areas, there is not much he or she can do to be

physically active, which would increase the risk of obesity. Studies have shown that Latino children are more likely to live in unsafe areas with poor street environments and less likely to get involved in organized physical activity, which are contributing factors that may lead to obesity (Nyberg, et al., 2011). The research has shown that Latino children are more at risk than white children in becoming obese.

### *Role of the Media and Technology*

It is evident that many children in the United States do not exercise enough. They are consuming too many calories and not burning enough energy because of a lack of physical activity. The media and technology play a big role in this epidemic because many children are on the computer, watching television, or playing video games, which are causing them to be inactive. The average child spends approximately five and a half hours each day watching television, which is very different than how it was in the past (Kaiser Family Foundation, 2004). Children today are incredibly technology savvy and new improvements in technology significantly affect their lifestyles, creating the inactivity, which can then lead to obesity.

There have been many studies done to understand the impact the media has on children. One overarching theme throughout multiple studies is that the time children spend using the media displaces the time they could be spending engaged in physical activity (Kaiser Family Foundation, 2004). Back in 1985, there was an analysis done by William Dietz and Stephen Gortmaker of 13,000 children who completed the National Health Examination Survey. They found significant associations between the amount of time children spent watching television and the prevalence of obesity (Kaiser Family Foundation, 2004). 29% of the cases of obesity could be prevented by reducing television viewing to zero to one hours per week (Kaiser Family Foundation, 2004). There have been many other statistically significant correlations between

how much television is being watched and the rates of obesity in children. However, no one study can prove a theory; they can only make correlations between the two variables. Extensive research must be done to ensure validity of the conclusions.

During the 1996-1997 school year, researchers at Stanford University conducted a randomized trial in which they reduced the amount of time a group of 100 third and fourth graders spent with T.V., videos, and video games. There was a control group and an experimental group that experienced a “turnoff” period of no use of media for ten days, which was then followed by limiting their television viewing to seven hours a week. Participants were also required to take a class learning media literacy skills to teach selective viewing. At the end of the 6 month, 18 lesson classroom curriculum, participants who received the intervention achieved statistically significant reductions in meals eaten in front of the television, as well as decreases in BMI, triceps skinfold thickness, waist circumference, and waist to hip ratio (Kaiser Family Foundation, 2004). Although, there were no findings of increased physical activity, the findings demonstrated the feasibility of decreasing body weight by decreasing time spent in front of the television.

Researchers hypothesized that the time spent in front of the television could result in a decrease in the time spent engaging in physical activities. However, there has not been any significant evidence to prove this hypothesis (Kaiser Family Foundation, 2004). Another possibility that has been posited is that the act of watching television decreases children’s metabolic rates, which would contribute to weight gain. One study found that television viewing decreased metabolic rates even more than resting or sleeping, but there have been several others that have found no such effect (Kaiser Family Foundation, 2004). There have

only been a few studies done on this topic, so more research needs to be done before a conclusion can be made.

Another hypothesis made by researchers is that the food advertisements children are exposed to on T.V. influence them to make unhealthy food choices. In the past, research indicates that children viewed a significantly lower amount of TV commercials than they do today. With the increasing number of cable channels and increasing amount of time spent in front of the television, the most recent estimates are that children view an average of more than 40,000 T.V. advertisements in a year (Kaiser Family Foundation, 2004). Health authorities believe that one of the main reasons children eat unhealthy food is because of the unhealthy messages they are receiving, while watching an average of fifteen food advertisements a day (Harris, Bargh, & Brownell, 2009). There has been less of a prevalence are fewer commercials for fruits and vegetables than there are for high-sugar cereals, fast food restaurants, and candy, which are communicated to children as “fun, happy, and cool” (Harris et al., 2009).

There was an experiment done by Harris, et al. with two groups of elementary school children (2009). One group watched a cartoon that contained food advertisements, and the other group watched the same cartoon with advertisements for other products. Both groups of children were given a bowl of goldfish to snack on if they chose to do so, while watching the cartoon. The researchers found that children consumed 45% more goldfish, when they were exposed to the food advertisements, meaning that this experiment proved the hypothesis that food advertisements cause children to make unhealthy choices to be true (Harris et al., 2009). It has been shown that television viewing and exposure to advertisements increases caloric intake and decreases diet quality in children and adolescents (Sacheck & Clark, 2008). Therefore, this correlation provides evidence to support the fact that although watching television does not take

away from time spent participating in physical activity, it validates the conclusion that watching television can prime eating behaviors, which can cause weight gain.

### *Initiatives to Help Change*

Physical activity is an essential component of a healthy lifestyle. With the growing popularity of childhood obesity, our society has recently been innovating new ideas to help stop the epidemic from getting any worse. If a solution is not implemented soon, one third of all children born in the year 2000 or later may very likely face obesity-related health problems such as: heart disease, high blood pressure, cancer, diabetes, or asthma (Partnership for a Healthier America, 2012). There has been quite a bit a research done on how to prevent obesity and how to fight it off.

### *Exergaming*

Because the role of the technology plays a significant part in the lives of young people today, researchers have been looking into a new type of physical activity that they are calling “exergaming,” (Fogel, Miltenberger, Graves, & Koehler, 2010). Exergaming is a technology that uses interactive video games to increase exercise behavior and it has been designed to try to capitalize on reinforcing the effects of video games (Fogel et al., 2010). Research has been done that shows that energy expended playing secondary video games is substantially less than the energy expenditure found when playing interactive video games (Fogel et al., 2010).

Fogel and her team of researchers conducted a study to evaluate the effects of exergaming on physical activity in a physical education classroom (2010). Four students (two girls and two boys), who were categorized as “inactive,” according to their definition, participated in their study. The research team allowed the entire physical education class to participate in the exergaming exercises, but only used the data from those four students. To

conduct the study, a classroom was converted into an exergaming lab in which there were nine stations with various equipment for the children to use. There was a “Dance Dance Revolution” station, there was Wii Baseball, Wii Tennis, Wii Boxing, there was a virtual biking game, and a few others that were used in this physical education class. They wanted to compare the effects of regular physical education class and exergaming on the duration of physical activity (Fogel et al., 2010).

The study yielded very positive results. They found that the exergaming condition resulted in higher levels of physical activity for all four participants than the normal physical education class. The exergaming condition resulted in an average of 9.2 minutes of physical activity; whereas, the normal physical education class resulted in an average of 1.6 minutes of physical activity (Fogel, et al., 2010). These results show that the exergaming condition allowed for the children to be significantly more physically active. Based on the data, exergaming produced six times the amount of physical activity than an everyday physical education class (Fogel, et al., 2010). This study capitalized on the significant use of video games, while simultaneously getting children more physically active, which could benefit in an initiative to fight childhood obesity. However, although, this seems like the perfect solution to get children more physically active, there are always limitations with every study. Future research may be needed to provide additional evaluations of the effects of exergaming on the physical activity levels in children and a larger population is needed to display significant results.

### *Let's Move!*

On February 9, 2010, First Lady, Michelle Obama launched her “Let’s Move!” campaign in an attempt to make steps toward solving the challenges of childhood obesity within a generation, so that children born today will grow up healthier and able to pursue their dreams

(Let's Move, 2010). "Let's Move!" is an initiative that was set up to increase opportunities for children to be physically active, both in school and outside of school, and also to create new opportunities for families to learn, grow, and develop together (Let's Move, 2010).

In an attempt to make a difference and a change in society, Michelle Obama has addressed governors, mayors, school groups, food makers, and other constituencies, urging them to build more bike paths and playgrounds, to serve healthier school lunches and to make and sell nutritious food (Huffington Post, 2011). She is doing everything she can to fight the childhood obesity epidemic. Her efforts over the past couple years, since the program started in February of 2010, have led to: schools planting fruit and vegetable gardens, schools opening salad bars in lunchrooms, and most notably, Walmart has cut the levels of salt, fat and sugar in their products (Huffington Post, 2011). She has been making remarkable steps in this metaphoric fight.

Let's Move! is dedicated to promoting healthy lifestyles among children and their families. The initiative focuses on creating a healthy start for children, empowering parents and caregivers, providing healthy food in schools, improving access to healthy and affordable foods, and increasing physical activity (Let's Move, 2010). Working to change policies and practices will enable more people to live healthier lives (Let's Move, 2010). Educating parents, teachers, or caregivers is important so that they know about the major issues that are going on in society today and how to keep their children healthy. Fostering environments that support healthy choices by providing nutritious foods in schools, as well as ensuring that every family has access to healthy affordable food, are two other functions of the Let's Move project (Let's Move, 2010). The importance of parental involvement seems to be paramount when addressing the epidemic that is currently taking place. The final vision of Let's Move is to help children become more physically active by reinforcing the physical activity guidelines in school systems and also by



partnering up with professional sports teams, so that children will have positive role models to follow (Let's Move, 2010).

Let's Move has partnered up with a number of different programs, which makes Michelle Obama's initiative even more successful. Along with the Partnership for a Healthier America, Let's Move has partnered up with the NFL's Play 60 campaign, which promotes physical fitness to children all over the United States (Let's Move, 2010). Let's Move has made a significant amount of progress since the initial idea, and as the popularity increases, it should begin to grow, affecting the greatest number of people possible.

#### *NFL's Play 60 Campaign*

Similar to Let's Move, the NFL's Play 60 campaign mainly focuses on the physical fitness aspect of healthy living. There are many professional athletic associations that have initiatives that promote children's physical activity as well, so the NFL's Play 60 program is not the only one. In accordance with the CDC's physical activity requirements, the NFL's "Play 60" program encourages children to go play for at least 60 minutes every single day (NFL Play 60, 2011). This initiative combines famous athletes with a generational push to be positive role models and encouragement for children to be active for a full hour each day.

Initiatives such as this use the media for a positive way to reach kids. Research has shown that children spend about 7.5 hours a day using media and technology (Let's Move, 2011). Along with this statistic, comes the idea that there is a lot of damaging and negatively influencing media promoting inactivity and unhealthy lifestyles (CDC, 2011). Often times, children do not have much exposure to positive media outlets. The NFL's Play 60 campaign makes being physically active seem fun, attractive, and "cool" when children see their favorite athletes getting involved in their communities to promote physical fitness (NFL Play 60, 2011).

It is extremely important that children see commercials like these, as well as promotions by the NBA and MLS, for example, showing them the positive, exciting side of being active.

The NFL's Play 60 initiative combined with the twenty other partnerships, allows for the promotion of physical fitness and healthy lifestyles to children, families, and communities (NFL Play 60, 2011). The American Heart Association has partnered up with the NFL's Play 60 campaign to teach educators and children to integrate health and fitness into daily classroom lectures (NFL Play 60, 2011). The National Dairy Council and the NFL have joined forces to make sure the children get all the nutrition they need, with an interactive program, where children are motivated to take control of their schools' focus on health and wellness (NFL Play 60, 2011). Along with "Let's Move!," the NFL has partnered with the President's Challenge Program, which challenges children to be physically active for 60 minutes a day, at least five days a week, for six out of eight weeks (NFL Play 60, 2011). Presidential Active Lifestyle Awards are given to those children who are able to complete this challenge. Some of the other partners include: the United Way, Action for Healthy Kids, Cartoon Network, Nike, Nickelodeon, The Boys and Girls Club of America, and KaBOOM! (NFL Play 60, 2011). All of the partnerships help popularize the promotion of physical fitness and healthy lifestyles across the United States by creating many different types of programs, which is one of the reasons why the NFL's Play 60 design has been so successful.

#### *Active Achievers*

Dr. Kyle McInnis and Professor Kevin Finn, at Merrimack College, have done extensive research on the associations between physical activity and academic achievement. A convincing body of growing research shows that physical activity not only improves health and reduces obesity, but it also effectively promotes optimal student academic success (Finn, 2012). Along

with the help of 5<sup>th</sup> and 6<sup>th</sup> grade science teachers from a the Lawrence school system, Professor Finn and Dr. McInnis created a seven week lesson plan integrating exercise activities and seven lessons of science content (Finn, 2012). Some of the ideas for the lessons and content were adapted from frameworks of the existing Science of Energy Balance and We Can! curricula developed by the National Institutes of Health (NIH) and National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The lessons introduced concepts of healthy lifestyles through regular physical activity and nutrition, while simultaneously teaching important principles in science, like analyzing data through graphs. In general, the lessons reinforced topics included as part of national and state science standards, such as structure and function in living systems, personal health, nutrition, and scientific investigation (Finn, 2012). Entitled “Active Achievers,” this program promotes physical activity, while enhancing academic achievement in students.

Last year, Professor Kevin Finn used this program design at Esperanza Academy, which is an all-girls school in Lawrence, Massachusetts. They incorporated physical activity into a science classroom, using pedometers, heart rate monitors, and accelerometers to track the girls’ data over a seven week period (Finn, 2012). There was a pre-test given at the beginning of the program to determine the knowledge of their science skills and then the same test was given at the end of the program to compare the results and see if there were any improvements. The findings from this study suggest that the Active Achievers framework helped to promote physical activity, facilitate student learning of science inquiry skills and content knowledge, and excite students about integrating physical activity into science lessons (Finn, 2012).

This past spring, along with a group of students from Merrimack College, Professor Finn and Dr. McInnis implemented the Active Achievers program into an afterschool setting, at the

YMCA in Lawrence, MA. Lawrence has the highest obesity rate in Massachusetts, notably among children and adolescents; therefore this program was utilized to help fight the epidemic (Finn, 2012). Similar to the program at Esperanza Academy, Professor Finn and his research team used the same type of design. Participants included ten males and six females, ranging in age from 11-13. The children were given a pre-test to evaluate their knowledge of basic science concepts. They were then asked to participate in physical activities for thirty minutes, two days a week, while wearing pedometers, heart rate monitors, and accelerometers to track their data. After the thirty minutes of activity, the children learned to record the data from their activity monitors in a notebook, and then would go down to the computer lab to answer some basic science content questions, on a website designed specifically for this project. At the end of the program, they will be given a post-test to see if their knowledge improved from the beginning of the program to the end. As the study is still taking place, the findings are not yet available; however, it is likely that the Active Achievers program will not only get the children physically active, but it will also help improve their science skills, as well.

### *Proposal for Change*

Based on the literature previously stated, this proposal will incorporate and encompass each of the major change initiatives, trying to combine them into one. Because of the major problem of childhood obesity in the United States, an intervention and outreach initiative needs to take place. Two of the most important populations this program should reach out to are students in the K-12 school systems and their parents. It is important to educate students and parents on the issues at hand because when people are knowledgeable of the problems that are going on, it is more likely for them to start an initiative. Not only educating the children, but education the parents is very important because they need to know about the causes of obesity so

that they can live a healthier lifestyle at home. If the program is powerful enough, the design may be powerful enough to change the world. If these two populations are well-educated on the issues of childhood obesity in our society, it could greatly benefit future generations because they will be the ones to start change.

Federal laws may need to be made to mandate a class teaching children in the K-12 school system about the issues with childhood obesity. The children will be required to learn about healthy living each year of school, so that it reinforces the facts that need to be learned and educates them about what the major issues of being unhealthy could lead to. The main topics of this class could be some of the same lessons that Professor Kevin Finn used in his Active Achievers Program, which included: learning about healthy eating, nutrition, calories, energy expenditure, how many steps an average child should take in a day to be healthy, the physical activity guidelines for healthy children, and also some of the new programs to help children become healthier.

It might be a challenge to educate the parents because they have their own busy lives and own opinions on the world already in place. For instance, parents may have full time jobs and a family, which would make it difficult for them to find the time to come to a parent education class, which would educate them on the issues at hand. It may be difficult to get parents to come in and sit through a class; however, it could be highly recommended that parents attend a parent education class at least twice a year. There are new laws beginning to surface, where parents have to go to a class in order for their child to get their license, so having a requirement for parents to attend at least two childhood obesity classes a year, in order for their child to pass to the next grade may be implemented.

It may also be a challenge to educate younger children because of the way this class is proposed to occur. Starting this program in the 6<sup>th</sup> grade and continuing it through the 12<sup>th</sup> grade, when children are beginning to grow and develop their own values, thoughts, and opinions may be best way to implement this initiative for change.

A school setting would be an ideal place to start an educational awareness of childhood obesity in our society. Students would be required to take a class during the day, for one semester, in which they would be educated about what is going on in the world. The main content and message of the class would be to teach students about the realities of our society and about how obesity is prevalent in their everyday lives. This class will demonstrate the importance of healthy living and encourage students to adopt values and actions that prevent unhealthy choices.

The classes will be discussion based because it is important for students to hear others' opinions and to talk through these issues amongst their peers. They will learn about various the various programs that are popping up around the nation and possibly be asked to join one of these initiatives for extra credit. It is important for students to reflect about how they feel about what they are learning. In order to assess their progress and knowledge, reflection papers will be due once a week. Each teacher will decide the length and what the content of the papers entail, but overall they will be used to help the students absorb the information being taught to them, and to connect it to what is happening in their everyday lives.

During the semester, the students will also be required to participate in a physical education class that will be held for sixty minutes each day, which meets the recommended guidelines for children and adolescents cited by the CDC (CDC, 2011). The children will wear heart rate monitors and pedometers, as like what they did in the Active Achievers program, to

track their physical activity data from the beginning of the semester until the end. Hopefully, the children will see improvements in their results from the beginning of this program until the end.

In the physical education class, there will be different exergaming stations set up that will be used to try to enhance the technology aspect of society. Children these days are very technology savvy and by using exergaming, it is a hope to get them excited about being physically active. Mimicking Fogel and her research team's experiment, the physical education classroom or gymnasium will be turned into an exergaming lab, with different stations that the children must go to within the sixty minutes of class (2010). Previous research has shown that exergaming resulted in higher levels of physical activity than normal physical education class (Fogel, et al., 2010). These results show that the exergaming condition allowed for children to be significantly more physically active. In an attempt to capitalize on the significant use of video games, while simultaneously getting children more physically active, this physical education class could be very beneficial in an initiative to fight childhood obesity. Hopefully, in participating in this physical education program, the classroom discussions and teachings will come alive for the students, reinforcing the concepts and benefits of healthy living and physical activity.

Throughout the semester there will also be guest speakers who come in and talk to the students about the childhood obesity epidemic and how important it is to live a healthy lifestyle, emphasizing physical activity and nutrition. The guest speakers will consist of real life people who are affected by obesity, either themselves or someone close to them and also possibly a famous professional athlete, from the NFL's Play 60 program. Doctors and dieticians will be asked to speak to the class, as well. The people that come in to talk to the students can explain their situation to them, how they feel about obesity, the importance of living healthy, and answer

any questions that the students may have. This will be of great significance because when the students listen to a firsthand account of a person who is personally affected by obesity or a professional athlete who is a role model to them, it will reinforce everything they have been learning throughout the semester. Guest speakers provide students with an entertaining form of interactional education, which will benefit their learning.

The guest speakers, the physical education class, the reflection papers, and the discussion-based class should keep students involved, attentive, and engaged in the class, which will promote academic achievement, and will hopefully plant seeds in their heads to begin to think about changing the way our society works one step at a time.

At the end of the semester, there will be a survey administered to every student in the class. There will be questions asking how much they learned from the class, if they liked the class, if they liked the teaching styles, what they learned from the program, if they will continue to try to be healthy after this class ends, and what they would like to see change about our program. The data will be collected and analyzed to see how much the students liked or disliked the class and what they learned from it. After conducting this type of class for a few years, a comparison can be done with the first year's data to the most recent year's data to observe and track any improvements.

In order to market this program to schools across the country, it will have to be sold to be successful and worthwhile. It will entice other schools because the cost can be kept relatively low. The only expenses that will need to be covered are the salaries for the teachers, the payments to the guest speakers, and purchasing the exergaming equipment. Hopefully, with the help of the right people this program could be government funded. This type of program is not looking to make a profit. The goal of this program is to educate the students and the parents, so



that they will take the initiative to help change our society in the near future and also, to make them aware of the childhood obesity epidemic that is occurring in America. People need to be shown that students will benefit and learn a great deal of information about our society from this class. If this program creates cultural awareness and teaches the students information about how they can get involved to help themselves and live a happier, healthier life, then it will be successful. Success will be measured by the answers we get from the surveys at the end of the semester.

Because of the technological world that society has become, it would probably be beneficial to market this program online. Videotaping the students in the physical education class, the guest speakers, and the discussions in class can show the world what type of events take place in the program. Using statistics of what it means to be obese, the physical activity guidelines that children should meet on a daily basis, the data from the physical education class, and statistics regarding the prevalence of childhood obesity in the United States can be very effective tools for selling the program. It is more beneficial for the students to see the effects of obesity happening in their own lives because then they will be able to relate to it, which is why marketing the program to school systems in locations where obesity is the most prevalent would be advantageous.

Overall, this program will be implemented for the good of our society. It will help students gain awareness and knowledge about issues happening right under their noses in society today. Hopefully, the class will teach students about how to live a healthy lifestyle, opening their eyes to new initiatives that should be taken to help solve the issues dealing with childhood obesity in the United States.

### *Limitations*

Further research may be needed to truly provide reasonable evidence on some of the topics mentioned throughout this paper. More research is needed on the effects of exergaming on children, possibly using a greater population to show significant results for this initiative. The role of the media yields both positive and negative results in the lifestyles of children; therefore, more research is needed to provide support for the hypotheses that were stated in this paper to be able to make conclusions. Although, this paper provides readers with comprehensive knowledge about the childhood obesity epidemic in the United States, and the lack of physical activities in schools, there is always room for further research.

### *Conclusion*

This significance of this paper was to teach readers about the problem of childhood obesity in the United States. The causes, effects, and health risks were discussed to give a general overview of the negative consequences obesity can have on people. The comparison of physical education in school systems from the very beginning of its existence up until now has dramatically changed and this is one of the prominent causes of childhood obesity. Along with poor nutrition, lack of exercise and leading a sedentary lifestyle can greatly provoke negative outcomes in children's overall health. Even though there has been a lack of physical education in school systems across the United States, there has also been a slight increase in the number of initiatives to help change this issue. In order to signify the importance to change the way our society is, this capstone paper was written in an attempt to educate readers on the initiatives for changing the childhood obesity epidemic in America. Michelle Obama's "Let's Move!" initiative, the NFL's Play60, the Active Achiever's program, and a new proposal for change were all discussed to provide readers with possible positive outlooks on the issues described

previously in the paper. If a change is not made in the near future, there will be a generation of people that may not outlive their parents. The childhood obesity epidemic is a huge issue in America, but overall, as shown through the research within the paper, there has been a greater push forward in the fight with childhood obesity.

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