

Childhood Obesity: Preventable?

Danielle Guidi

Anna Maria College

Author's Note

This thesis paper was prepared for Dr. Blais in the Liberal Arts Department at Anna Maria College and for Dr. Ciance in the Nursing Department at Anna Maria College.

Abstract

Obesity is a pandemic currently happening in countries all over the world. Obesity has numerous health consequences that have both immediate and long-term effects on the body. Children are now being diagnosed with obesity at much younger ages than in past years. Childhood obesity impacts children and families everywhere and can have numerous causes. This research thesis will go into further research about certain causes of obesity in children. A research study was conducted at a local elementary school in Worcester, Massachusetts. This study utilized a pre- and post- assessment questionnaire to gather data regarding the education level of the students. The results of the study show that there is a lack of education in students when it comes to nutrition and physical activity. It is important to educate both children and adults the importance of leading a healthy lifestyle. The health consequences are much greater later in life if obesity goes untreated.

Childhood Obesity: Preventable?

Part 1

Seventy million children around the world will be obese in 2025 (World Health Organization, 2000). Obesity simply is linked to two factors: lack of exercise and a diet high in saturated fats, sugars, and carbohydrates. When the issue of diet arises a lot of people jump to the conclusion of poverty. Poverty does contribute to lack of adequate food however, other factors exist. According to the article, *Poverty, Obesity, and Malnutrition: An International Perspective Recognizing the Paradox* (2007), food insecurity is directly linked with both hunger and obesity. Food insecurity stems from the issue of lack of access to adequate foods and the nutrients that the body needs. 49 million Americans have a hard time having access to food and putting food on the table for them and their family, that breaks down to one in six people in the United States (11 Facts About Hunger in the US). Food is a basic necessity for the body to function properly and lack of access to nutrient filled foods like fruits and vegetables will lead to childhood obesity which in turn will lead to cardiovascular disease, diabetes, and some cancers.

Obesity is a chronic disease, however: it is reversible. Primary prevention in childhood obesity is the source of reversing the global pandemic. Primary prevention is based around the idea of education. Educating children and adults of all ages will increase their exposure to the knowledge of a healthier lifestyle. It is the first step in intervening with this global pandemic. Education can be provided through many different delivery systems. The way children learn is different than that of an adult. In a group of studies conducted around the world, it was found that 16 out of 24 educational programs about diet and exercise were effective and had a positive impact on the children (The prevention of overweight and obesity in children adolescents: a

review of interventions and programs, 2006). Implementing education into schools is just one way to increase the awareness of childhood obesity.

Childhood obesity affects children from infancy through adolescence worldwide. In the World Health Organization region in Africa alone, the childhood obesity rates increased from 4 million to 9 million from 1990 to 2016 (World Health Organization, 2000). Similar to obesity in adults, childhood obesity can have more of an impact on one race than another. According to the Center for Disease Control, the prevalence of obesity in children aged two through 19 was higher in Hispanics- 21.9%, non-Hispanic blacks- 19.5%, and non-Hispanic whites- 14.7% (CDC- Childhood Obesity Facts, 2017). In terms of prevalence based on age, the highest prevalence rate is among those 12-19 with 20.5% (CDC- Childhood Obesity Facts, 2017). In the United States, we have laws in place to mandate children to attend a structured school setting until a certain age. In other regions of the world, those laws do not exist and children often times do not attend school because it is needed that they work and make money to help their family survive. Educating inside a school setting would make sense in school systems throughout the United States, but what about the other 194 nations in the world (How many countries are in the world? 2016) A different means of education is needed for those populations of children. When looking at a global issue it is important to take all factors into consideration when attempting to develop a solution.

Funding nationwide and international programs to prevent obesity is essential to reversing the pandemic. In order to be considered a credible program it should be proven to be effective. Not all programs that are being used today as a means of educating children about preventing obesity or how to deal with obesity are effective and create a positive impact on these children's lives. There have been multiple programs funded through the government, state level,

local and community level, and on an international level. There have been a lot of creative programs created for children to promote diet and exercise, Let's Move which is created and implemented with Michelle Obama and the Play 60 program created by the NFL. These are two examples of large movements created in hopes that they can intervene early with childhood obesity and to establish healthy routines in children. Have they been effective?

Statement of the Problem

In the media, there is a lot of focus on healthy foods and exercise. These are the two main contributing factors of obesity in children. Technology advancement allows children to be focused on the latest video game, the newest iOS update for their iPhone, or the addition of their favorite television show on Netflix. The advancement of technology also allows for the marketing of junk food and fast food. Food insecurity plays a role in the development of obesity around the world. With food insecurity comes the issue of chemicals and additives in foods that allow the companies to make the same amount of product for less money. Food insecurity is a common problem around the world and leads to the consumption of unhealthy foods. Societal norms have taken control and contributed to obesity: portion sizes, irregular meal times or eating on the go, and a sedentary lifestyle. Children are easily influenced by the people around them on a daily basis and grow up to do what they knew growing up.

Technology

Technological advances in the 21st century have allowed for children to grow up in a world where having the latest gaming device, the newest iPhone, or having smart features in your home is a necessity. Children aged “8- to 18-year-olds consume an average of seven hours and 11 minutes of screen media per day” (Almon, Linn & Levin 2012). Screen time can consist

of scrolling through social media, playing video games, watching television, using the internet, or utilizing a tablet. All of these can result in less time outside, less time being active, and less family interactions. Companies utilize the media to market their products. The media is a great platform to advertise their product, and what better audience than children? If the average child is exposed to seven hours of screen time, think of the influence these companies can have on these children.

Food Insecurity

Children in the United States and all over the world are unsure of when and where their next meal will be. In 2014, 69% of Americans had to choose between paying the utility bill or putting food on the table and 79% of Americans knowingly chose unhealthy food simply because it was inexpensive. Being faced with the option to either pay the utility bill or put food on the table should not exist. Nutritious food should be available for everyone around the world. Inexpensive and unhealthy food are becoming the usual products that people buy for their children because it is what is available at the price that is right. Children are being sent to school with cans of soda, ramen noodles, bags of chips, or even no lunch at all because the school lunch option is too expensive or the parents cannot provide nutritious food and fruits and vegetables for the child.

Lifestyle

In the United States, the society has become more sedentary as a whole. Adults and children rely on gadgets and machines to go about their day: vehicles, garage door openers, television remotes, 'smart' technology in the home, dishwashers, and many more. These gadgets take away from the principle of manually completing the task. Portion size has doubled and

tripled over the past 20 years. The following meal, if consumed every day with the typical portion sizes of today, will add up to an additional 500,000 calories a year (We Can, 2013):

- Breakfast: a bagel (6 inches in diameter) and a 16-ounce coffee with sugar and milk.
- Lunch: two pieces of pepperoni pizza and a 20-ounce soda.
- Dinner: a chicken Caesar salad and a 20-ounce soda.

For most people, that sounds like a typical intake for food. In comparison to twenty years ago, the portion sizes of the food have tripled. Fast food restaurants are notorious for increasing their portion sizes. The movie *Supersize Me* explains the truth behind McDonalds sizes and the impact it has on an individual's health. Fast food restaurants are also easily accessible for families that are on the go or are an easy solution for the family that does not have the time to sit down and have a meal together.

In conclusion, there are many factors that contribute to childhood obesity. Society has influenced factors that have increased the rates of childhood obesity. Technology has made children more at risk for developing obesity. Children are susceptible to being influenced and they are taught to rely on machines to complete simple tasks in their every-day life. Inadequate access to healthy foods also places the child and family at risk for obesity.

Background and Need

Solutions to childhood obesity are complex. There is not one solution that will reverse the prevalence rates. There are many programs implemented by the government, states, and communities that are working towards healthier goals for the children. Many food programs exist that provide assistance to low income families for groceries and other necessities. School

systems often will have a reduced or free lunch program for those children whose families qualify. Natural and organic restaurants have started to become more economical and more accessible for families with children.

Technology

The generation that is growing up now are tuned in with technology and utilize it in their every-day life. New technology like *Fitbit* and *Apple Watches* can track physical activity and keep record of heart rate, miles walked, stairs climbed. iPhones can also be utilized to track caloric intake after downloading fitness apps. Technology can be helpful in motivating children to exercise and to keep track and record activity. Programs will reward children and students who can prove that they exercised a certain amount per week which can be fun for the children. This provides competition which children and adolescents love.

Food Insecurity

Assistive programs exist that are funded by the government and by the state for families. In Massachusetts, the government has implemented a federally funded program for Women, Infants, and Children. This program supplies “supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk” (Woman Infants & Children, 2018). This program ensures that mothers and children that are at risk for inadequate nutrition are given the assistance needed to provide nutritious food. WIC also provides resources for those that qualify such as immunization referrals, abuse resources, breastfeeding clinics, and health screenings. There are other programs that assist families to

provide nutritious foods for their children like local food banks or free meals provided by local churches or organizations.

Lifestyle

It is difficult to have control or influence over corporate restaurants. When it comes to portion size it is just crucial to educate children about portion control and the appropriate amounts of food to eat throughout the day. There are many ways to promote portion control with children. There are many companies that produce containers that should be the allotted amount of certain foods throughout the day. This makes packing a child's lunch for school that much easier. The parents just fill the appropriate containers with the food and the child stays within the suggested portion size. In a society that is advancing quickly with smart technology, it can be difficult to manually complete tasks like washing the dishes by hand, getting up and turning the television off without the remote, and utilizing vehicles less. It can be difficult it just takes education for the parents and the children.

In conclusion, creating a solution for a global pandemic will take education and exposure to healthy choices. Programs that have been implemented and funded by federal, state, and local governments are making a positive impact on families and children. Influential people that are in positions of power have also made a positive impact by creating programs to promote a healthy lifestyle for children. Michelle Obama created a *Let's Move* program that allows children and their families to participate and are rewarded for their healthy behavior.

Purpose of the Study

The purpose of this study was to use an assessment tool to evaluate the effectiveness of education surrounding childhood obesity to children in local elementary schools. Childhood

obesity is a global pandemic and without interventions that are effective, children will begin to experience the health-related consequences at earlier ages. Educating children at a young age about the healthier choices when it comes to food and exercise will in turn elongate their life expectancy and promote a healthier lifestyle. To evaluate the effectiveness of educational interventions when it comes to childhood obesity, the tool that was used in this study was a survey. A ten-question assessment tool was given to 30 children prior to the education to see what their baseline knowledge was. Once the pre-assessment tool was completed, the educational session began. This included healthier options regarding food, snacks, drinks and juices, and proper exercise techniques. Recommended times for exercise and the need to limit technology is also included in the educational session. Once the education is given, there will be a post-assessment that will reveal if the education was effective in teaching the children on methods to prevent obesity. The projected outcome is that the education will be effective and the children will learn to choose the healthier options when to food and their knowledge regarding exercise and technology will increase.

Research Questions

-What are means of effective teaching about childhood obesity for children?

-How effective are programs that have been implemented by mainstream campaigns at preventing childhood obesity?

Significance to Field/Significance of the Study

The health care field is not all consumed with science and medicine. Health care involves all people and their livelihood. Any interventions in the health field whether it be primary, secondary, or tertiary prevention is beneficial and a positive step forward. Obesity is currently a

global pandemic and effects millions of children. Providing interventions and prevention methods that have any positive impact can be largely beneficial for all who are involved. Increased health benefits include: decreased risk of heart disease, diabetes, coronary artery disease, hypertension, stroke, and arthritis, increased in mood, activity, and productivity, and increased self-esteem which has multiple positive effects in school and social lives of children.

Definitions

Body Mass Index (BMI)- A key index for relating weight to height. BMI is a person's weight in kilograms (kg) divided by his or her height in meters squared. Obesity is a BMI of 30 or more for either (Webster's Dictionary, 2018).

Childhood Obesity- a BMI at or above the 95th percentile for children and teens of the same age and sex (CDC, 2016).

Pandemic- occurring over a wide geographic area and affecting a high proportion of the population (Webster's Dictionary, 2018).

Prevalence- percentage of a population that is affected with a particular disease (Webster's Dictionary).

Limitations

Conducting research as a full-time student poses limitations. The largest limitation in this research is time. Adequate time can allow for extensive and in-depth research studies which will create a credible thesis. One semester, 15 weeks, to complete a research study and thesis is quite limited also considering the limited resources at Anna Maria College in regards to funding and materials. Conducting credible research has the ability to be costly. There is no budget within

Anna Maria College to allow students to conduct the appropriate research. These limitations allow the students to think outside of the box and be creative in research methodology and time management. With these limitations, it is difficult to conduct a research study that will be effective and have reliable results. Having control over the group is important in controlling the study and variables that may happen during the research process. These limitations affect both the internal and the external validity of the research.

Ethical Considerations

Obtaining the assessment and research from Vernon Hill Elementary school was conducted in an ethical manner. Proper permission was obtained through the principal of the school. Permission was granted as well from the teacher of the classroom where the students participated in the assessment. There was no use of an Institutional Review Board in this study. The assessment and the tools used were approved through faculty advisors.

Part 2

The prevalence rates of childhood obesity are now at an all-time high around the world. On the surface, there can seem as if the only cause to childhood obesity is eating poor food choices. The problem stems much deeper than fast food and extra desserts. The media and health care campaigns look at mainstream causes to issues like childhood obesity. The Center for Disease and Control has recently shifted their outlook from diseases and root causes, to preventative measures for disease and illness (CDC, 2016). Primary prevention is ideally the most effective way to intervene with a health issue like childhood obesity. Primary prevention focuses on education and creating awareness around the issue. Secondary and tertiary prevention

are used often as well. However, with a disease like childhood obesity it is crucial to intervene at any point during the disease process.

The literature review will address three areas related childhood obesity. The first section will address research related to technological advancement and the use of technology to promote exercise and a healthy lifestyle. The second section will focus on research studies about food insecurity and the programs implemented to assist families with children. Finally, the third section will discuss research related to lifestyle changes and ways to promote portion control and to minimize relying on technology to complete daily tasks.

Technology: Media parenting in the context of childhood obesity research

This study focuses on the parental approach and influence on children. It addresses the influence of media on the children in the presence of obesity. The theme through this research study is the role of modeling by the parent. The analysis of the study is aimed at two different ideas.

The purpose of this study is “to identify studies on childhood obesity and parenting, and draw out those studies with a particular focus on media parenting” (Tobio, A., et al., 2016). A. Tobio, C. Ganter, S. Gicevic, & K. Davison work in the Department of Nutrition at Harvard T.H. Chan School of Public Health in Boston, Massachusetts. S. Newlan work for the Department of Epidemiology at Harvard T.H. Chan School of Public Health in Boston, Massachusetts. C. Simon works for the Department of Social and Behavioral Sciences at Harvard in Boston, Massachusetts. Finally, J. Manganello works for the Department of Health Policy, Management, and Behavior at the University of Albany, SUNY, Albany, New York.

This study took place in Boston, Massachusetts. For this study, a multi-stage process was used to: 1) identify articles on parenting in the context of childhood obesity; 2) screen for eligibility; and 3) compile a final sample of studies for full-text coding (Tobio, A., et al., 2016). The information in this study relied on the results of other research projects. The researchers relied on the parents (the participants) to relay the information regarding their parenting modeling and the use of media in the household. The study utilized people of all ages, races, social class, and geographic region.

The study is looking at the effects the parents have on the children regarding media use and then the further result of childhood obesity. The researchers want to look at the impact of parents on children from various angles. Parenting styles vary and everyone has different viewpoints when it comes to electronics and screen time versus active time outside. This research study involves coding procedures. Data was contracted from eligible studies using a quantitative analysis which leads to a systematic review or many research studies. One hundred and three eligible studies were further coded by two trained coders.

The studies had many variables, however; the variables that did not change was the criteria and coding analysis used to select the eligible studies. The researchers used five set databases to discover the final research studies that could be used to conduct their research. The data was collected through a series of screenings processes. Only a small amount of studies were utilized in the final data.

The researchers “assessed inter-coder reliability using both simple percent agreement and the Krippendorff’s alpha (kappa; α) coefficient [22] for each coding category by double-coding a randomly selected sample of eligible studies (15 %; n = 15)” (Tobio, A., et al. 2016). The

researchers then “calculated reliability statistics across all 15 studies using STATA 13, resulting in an average k-alpha of 0.83 (range: 0.6–1.0), and average simple percent agreement of 0.95 (range 0.8–1.0)” (Tobia, A., et al., 2016). The data that was collected was then further analyzed and put into tables based on variables and characteristics.

Results

Various parenting styles were looked at in these studies. In the studies that were used, 82% of the studies assessed the parenting styles around the use of media and technology for the children. In those studies, one of the most common rules around media were those related to the use of time limits. Fifty seven percent of parents set boundaries when it comes to time allowed with media. The second most common theme was parent-child co-viewing media. This idea is 42% popular with the parents used in the studies (Tobio, A., et al., 2016).

Data from this research study shoes a direct correlation with screen time with the incidence of childhood obesity. When discussing the influence of parents on children and the use of media, it varies by culture. It has been made clear that there is a need for education when it comes to appropriate time allotments and what is appropriate for what age group to be watching on the TV or searching on the internet. This research study is restricted to the English language. There were also limitations when it comes to the type of studies that were eligible. Non-intervention studies were the only type of study analyzed and used for the research.

Food Insecurity: Increasing access to healthful foods

Low-income families are identified as having inadequate food choices. Inadequate nutrition can lead to obesity and other deficiencies in the body. There are factors that contribute to food insecurity and they are further investigated in this study. The purpose of this study is to

“gather low-income community members’ opinions about their food purchasing choices and their perceptions of the most effective ways to increase access to healthful foods in their communities” (Evans, A., et al, 2015). Having direct contact with the communities in need can give accurate information to the researcher. From having contact directly with the members of the community, the researcher can get first-hand knowledge and insight about the problems related to food insecurity and further develop solutions from the research.

Focus groups were used in the development of this research study. The study took place in central Texas. One hundred forty-eight adults were initially included in the study, and those individuals all fell below the poverty line. The focus groups contained people from 11 zip codes. This is a qualitative study; therefore, it is based on people’s word and observation made by the researchers. The issue of inadequate food is explored in this study. Various people explain how difficult it can be living in a rural area as low income, to get the healthy and nutritious food that is needed to live a healthy life.

In this qualitative study, the focus groups were “about their knowledge of healthful eating, factors influencing their food purchasing decisions, and their perceptions regarding solutions to increase access to more healthful foods” (Evans, A., et al, 2015). This study utilizes interviews and questionnaires to obtain the information needed to analyze the participants. Having focus groups in the study allows for the members to fully express their concerns without fear of judgment or bias. The focus groups contained both Spanish and English-speaking participants. Each group had a moderator that spoke both languages so they could translate if needed. Once the groups were over, the information was transcribed using an audiotape to have written record of the information that was given within the focus group.

For the analysis of the information in this study, a thematic content analysis approach was used. Each transcript was entered into the qualitative software package QSR NViv and then two coders analyzed the information. Certain themes were identified throughout the analysis process. Thirteen focus groups were used in this study, six English speaking groups and seven Spanish speaking groups. Each focus group was asked the same questions to keep it controlled. Please see table below for the results of this study.

Total Household Income/Month		
\$0-999 USD	55	37.16%
\$1000-1999	51	34.46%
\$2000-2999	14	9.46%
\$3000-3999	3	2.03%
\$4000+	13	8.78%
Missing	12	9.46%
Receive WIC vouchers		
No	117	79.05%
Yes	31	20.95%
Receive Supplemental Nutrition Assistance Benefits		
No	99	66.89%
Yes	43	29.05%
Run out of food before end of month because can't afford more		
Almost always	55	37.16%
Sometimes	45	30.41%

Not very often	48	32.43%
----------------	----	--------

(Evans, A., et al, 2015)

There is a definite need for alternative food sources in the rural areas of central Texas. It was shown in the study that low-income families do not have access to adequate food sources whether it be supermarkets, convenience stores, farmers markets, or community gardens. The researchers suggest incentives for both companies and for the consumers in these rural areas.

This study only utilized low income families to analyze however, food insecurity does not just impact low-income families. For the sake of the issue of childhood obesity, we look at all issues that can negatively impact a child and increase their risk of having obesity.

Lifestyle: The International study of childhood obesity, lifestyle and the environment

This study is designed to show the correlation between the lifestyle choices that are made and the climbing obesity rates in children. This study reached a sample of 6,000 ten-year-old children from various countries around the world (Katzmarzyk, P., 2013). The researchers took into account many lifestyle choices: diet, exercise, family and neighborhood environments, and school systems. When addressing global pandemic like childhood obesity it is crucial to explore all contributing factors. Lifestyle changes and cultural changes play a large role in the development of obesity.

This study found that there is a direct link between lifestyle changes and stressors and the health of the child. The environment surrounding the child can heavily influence their eating and activity habits. It is important for the child to learn from an early age the appropriate foods to eat as well as appropriate physical activities for specific age groups.

Summary

Childhood obesity impacts millions of children around the world. It is crucial to identify as many factors as possible in order to decrease the incidence rates around the world. Children are easily influenced by those surrounding them. Parents are among those most influential. It is important for parents to be educated about living a healthy lifestyle and to lead by example. It is also important for parents to know the various resources available in their communities if they are struggling to put nutritious food on the table for the family.

Part 3

Childhood obesity is a global health issue that impacts thousands of children's lives and impends on their future as healthy individuals. Health professionals promote health education and lifestyle modifications. Health promotion programs have been implemented for children in order to create an interactive environment where the child can learn healthier decisions. Primary prevention is the goal throughout all areas of health care. The interactive educational programs like *Let's Move* by Michelle Obama or the *Play60* by the NFL are methods of intended tertiary prevention.

The goal of these programs is to reduce the incidence of childhood obesity and to reverse the growing numbers of children impacted by obesity. The effectiveness of the programs is the only way to know if the goal will be met. It is important to look at how effective the programs are once they have been implemented. If the intervention is successful, it means that children are using the program and learning to live a healthier lifestyle by making better choices when it comes to diet and exercise.

When analyzing whether a program is effective or not, it is important to look at all scales of programs. Small assessments inside a classroom, afterschool programs, and nationwide programs that allow to track progress online are all programs with the same goal, to increase awareness and to reduce the incidence of childhood obesity. Utilizing a small classroom with a brief questionnaire and a fun education session can be successful.

Setting

While childhood obesity is a global health issue and impacts children of all ages and backgrounds, one way to make a change is to begin in the local communities. Massachusetts has a rate of 26.6% of ten-17 year olds that are obese (State of Obesity in Massachusetts 2016). This is a decline from past years. Worcester, Massachusetts also has a high prevalence for childhood obesity. The obesity rates in Worcester, Massachusetts can be attributed to many things. One aspect in particular that stands out is food insecurity and inadequate nutrition that leads to increasing rates of obesity in children.

Elementary school have some policies in place to regulate the food or the physical activity for the children. Vernon Hill Elementary school located in Worcester, Massachusetts has a high rate of poverty in the students. Third grade students are at the appropriate age to begin learning healthy choices when it comes to snacks and meals as well as appropriate times to play and exercise.

Participants

The particular classroom was decided upon due to connections between the researcher and the teacher of the classroom. The classroom consists of 28 children. The population of children in the Worcester area are subject to food insecurity and poverty. Sixty eight percent of

the children who attend public school systems in Worcester, Massachusetts are homeless or have inadequate housing. These children are not guaranteed their next meal, let alone a healthy and nutritious meal. The children are then subject to eat what the school supplies. Massachusetts has passed policies that require schools to carry healthy options for both breakfast and lunch. At Vernon Hill Elementary, the school provides breakfast to every student free of charge. The breakfast contains a cereal option, a piece of fruit, and a small carton of milk. In the classroom which participated in the questionnaire, 25 out of the 28 students partake in eating the breakfast provided by the school because there are no food options at home. This healthy meal allows the students to have a nutritious meal to start their day.

The classroom has 28 students. 15 of the children are boys and 13 of the children are girls. The children are of all races. Of the total class, 19 are African American, five are Hispanic, and four are Caucasian. The children are aged eight to nine years old.

Materials

The intervention used was interactive education. Once the pre-assessment questionnaire was completed by the students, the researcher looked at the results. Based upon the results of the questionnaire, the researcher then educated the students. This method utilizes the child's short-term memory in terms of assessing the education that is provided. The education material is designed to be at a second-grade reading level. The idea of designing it a grade lower than the target grade is because of the literacy rate of the class. The researcher wanted all of the students to understand the education, as it is very important to learn healthier lifestyle choices. Various education materials are used: interactive physical activity to complete in place (i.e.: jumping jacks and running in place), pictures and video material, poster material, and individual paper

handouts for each student. The topics that are covered are: healthy snack and food choices, physical activity, resources for healthy food, future health risks, and comorbidities to obesity.

Measurement Instruments

The tool that is used in this research study is a ten-question questionnaire (See Appendix 1). There are two assessment questionnaires, the pre- and the post- questions. The pre-intervention questionnaire will be given before any education is provided to the children. This will allow for the children to share what they know and to enlighten what areas they need more education. The questions will assess basic knowledge about health and physical activity. The questions are age appropriate and are prepared at a second-grade reading level. Upon the completion of the pre-intervention questions the education will begin. Once the education has been completed, the post-intervention questions will be given. The questions will be the same as the pre-intervention questions. The goal is that the children will learn the material and utilize it in their daily lives.

Procedure

Each student will receive a pre-intervention questionnaire. The children will be instructed to complete the assignment individually without help from their neighbors. If a student has difficulty reading or does not understand what the question is asking, then the child can receive help from the researcher. The child is to answer each question based on their own knowledge. That allows the pre-intervention assessment to be accurate and test the true knowledge of the students about to receive the education. The education will be provided for all learning styles in various ways: visual, written, auditory, and hands-on. The teacher will remain in the classroom

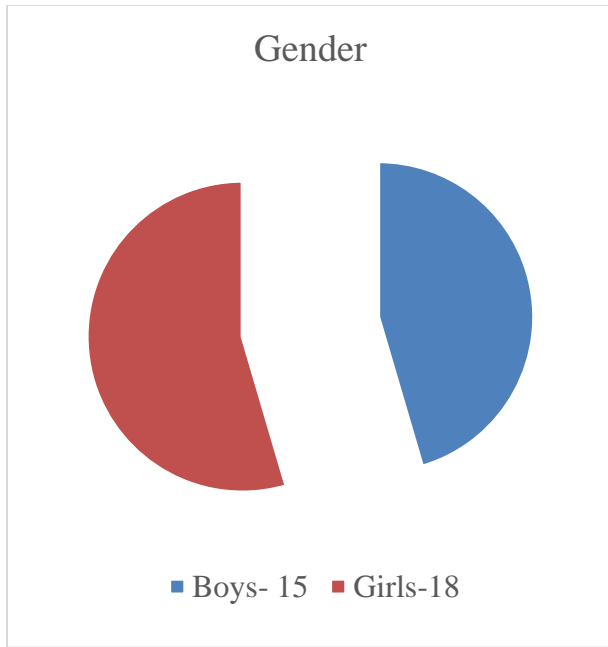
as long as the researcher is inside. The teacher provides security and a familiar face for the students.

Data Analysis

The data is analyzed by the researcher. It is analyzed by assessing the answers to the pre- and post- intervention questions. The student will put their name on their questionnaires so it is easier for the researcher to see if the student learned anything from the pre-education to the post-education questions. The answers on the pre-assessment questionnaire will be the basis for the education. The areas that need to be stressed on will become evident in the answers that the children give to the researcher.

Part 4

Twenty-eight children were evaluated at the third-grade level. Fifteen children are boys and 18 are girls. Of the total class, 15 are African American, five are Hispanic, and four are Caucasian.



Question # (See Appendix 1)	Answered correctly pre-assessment	Answered correctly post-assessment
1	15	28
2	20	28
3	13	28
4	22	28
5	12	28
6	17	28
7	10	28
8	24	28
9	20	28
10	19	28

After reviewing the data collected at the elementary school, it was clear that education needed to be provided to the students. There were knowledge deficits in both areas of nutrition and physical activity. The education deemed was 100% successful with all 28 students. The students demonstrated their new knowledge by correctly answering the post-assessment questions.

Part 5

The incidence rate of childhood obesity has increased dramatically over the past 20 years. Many factors are responsible for creating such a wide spread global pandemic. Childhood obesity has many health consequences later in life: cardiac disease, hypertension, diabetes, osteoarthritis, cancers, and strokes. It is crucial for people to be educated on the importance of a healthy lifestyle, exercise, diet, limiting screen time, and many more things. There are many resources available to people at the federal, state, and local level. Communities should be more outspoken about what resources are available to those in need.

The purpose of the study is to evaluate the effectiveness of education in children about obesity and living a healthy lifestyle. The study involved a third-grade classroom at an inner-city school located in Worcester, Massachusetts, USA. Twenty-eight students were involved in my ten-question survey.

Limitations

If this study were to be completed again, there would be adjustments made. The time restraint of the study was very restrictive. Fifteen weeks to complete the entire research project was not enough time. If more time was allowed, a more thorough study could have been done and with more participants to get a larger sample size. Ethical considerations would be made in

further research studies. Additional methods would also be used, one method does not ensure a reliable research study.

Recommendations for Future Research

In additional research, it is recommended that an observational piece be added to the study. It is important to observe how children act both at school and at home. What are their habits at school? Do they eat healthy in front of their friends? Are there multiple people living in their home- which can contribute to food insecurity? Childhood obesity is a pandemic however, it is also important to research obesity of all ages. Obesity has serious health consequences that impact people of all ages, races, sex, religion, ethnicity, etc.

In conclusion, it is evident that children spend too much time in front of screens and utilizing technology. With increased screen time, there is an increase in activity which leads to an increase of incidence of obesity. Food insecurity is a crisis that people are experiencing all over the world. Human beings should not be denied food just because there is an inadequate supply, or they are low-income, or they live in a rural area. Technological advances are something that will not go away. The world we live in today is consumed by technology and new advancements. As inhabitants of the planet, it is our responsibility to adapt and still maintain our healthy lifestyles. Education is needed about proper use of 'smart' devices and the influence of marketing on children.

Childhood obesity does not develop overnight. It is a slow process that takes years to develop. It is imperative that parents are educated about: the proper foods to be giving their child, the amount of exercise that is needed for their age group, the technology use in their homes, and the idea of physical activity at home or after school with sports. Education is a means

of primary prevention; however, it is for a tertiary cause. Obesity is a global pandemic; education is the prevention needed to reduce the incidence rates.

Appendix 1

Pre- and Post- Assessment Questionnaire

1. Which food will provide you with the most energy for breakfast?
 - a. Whole Grain Cheerios
 - b. Ice Cream
 - c. Pop-Tart
2. How much should you exercise?
 - a. 1 minute/day
 - b. 1 hour/day
 - c. 1 hour/week
3. Which foods should take up most of your plate?
 - a. Chips
 - b. Meat
 - c. Vegetables
4. If you can't play outside after school, what should you do?
 - a. Watch a basketball game on TV
 - b. Turn on the music and dance!
 - c. Eat candy bars on the couch
5. When you are thirsty, what is the best choice to drink?
 - a. Water
 - b. Soda
 - c. Gatorade
6. Can you eat your favorite foods like pizza, chocolate, and ice cream?

- a. No, never.
 - b. Yes, every day
 - c. Yes, in moderation.
7. How long can you watch TV or play video games for after school?
- a. 1 hour/day
 - b. 30 minutes/day
 - c. 3 hours/day
8. What is a nutritious afterschool snack?
- a. Goldfish and a juice box
 - b. Candy bar and milk
 - c. Strawberries and water
9. Do you have to go to the gym to exercise?
- a. Yes, but only once a week
 - b. No, you can be physically active anywhere
 - c. Yes, you have to go to the gym every day after school
10. If you need getting nutritious food at home, who should you talk to?
- a. My teacher at school
 - b. The school nurse
 - c. Both answer A and answer B

References

- Childhood Obesity Facts. (2017) Retrieved from www.cdc.gov/obesity/data/childhood
- Doak, C. M., Visscher, T. L. S., Renders, C. M. & Siedell, J. C. (2006). The prevention of overweight and obesity in children and adolescents: a review of interventions and programs. *Obesity Reviews*. doi 10.1111/j.1467-789X.2006.00234.x
- Evans, A., Banks, K., Jennings, R., Nehme, E., Nemecek, C., Sharma, S., Hussaini, A., & Yaroch, A. (2015) Increasing access to healthful foods: a qualitative study with residents of low-income communities. *BMC: International Journal of Behavioral Nutrition and Physical Activity* (12). doi: 10.1186/1479-5868-12-S1-S5
- Facts and figures on childhood obesity. (2017) Retrieved from www.who.int/end-childhood-obesity
- How many countries are in the world? (2016) Retrieved from www.worldatlas.com/nations
- Katzmarzyc, P., Barreira, T., Broyles, S., Champagne, C., and Chaput, J-P. (2013). The international study of childhood obesity, lifestyle, and the environment. *BMC Public Health*. doi: 10.1186/1471-2458-13-900
- Sahoo, K., Sahoo, B., Choudhury, A. K., Sofi, N. Y., Kumar, R. & Bhadoria, A. S. (2015). Childhood Obesity: causes and consequences. *NCBI*. doi 10.4103/2249-4863.154628
- Sherry, A. T., Anderson, C., Kaufer-Horwitz, M., Bode, L., Emenaker, N., Hagg, A. M., Satia, J.

- A., Silver, H. J. & Stadler, D. D. (2007). Poverty, obesity, and malnutrition: an international perspective recognizing the paradox. *Journal of the academy of nutrition and dietetics*. doi <https://doi.org/10.1016/j.jada.2007.08.007>
- State of Obesity in Massachusetts. (2016). *State of obesity: better policies for a healthier America*. Retrieved from <https://stateofobesity.org/states/ma/>
- Teixeira, P. J., Carraca, E. V., Markland, D., Silva, M. N. & Ryan, R. M. (2012). Exercise, physical activity, and self-determination theory: a systematic review. *NCBI*. doi 10.1186/1479-5868-9-78
- Tobio, A., Ganter, C., Gicevic, S., Newlan, S., Simon, C., Davison, K., & Mangello, J. (2016). A systematic review of media parenting in the context of childhood obesity research. *BMC Public Health* (1). doi: 10.1186/s12889-016-2981-5.
- Wakefield, M. A., Loken, B. & Hornik, R. C. (2010). Use of mass media campaigns to change health behavior. *NCBI*. doi 10.1016/S0140-6736(10)60809-4
- Webster's Dictionary (2018). *Prevalence, pandemic, and body mass index*. Retrieved from <https://www.merriam-webster.com/dictionary>
- We Can: Larger portion sizes contribute to U.S. obesity problem. (2013). *National Heart, Lung, and Blood Institute*. Retrieved from <https://www.nhlbi.nih.gov/health/educational/wecan/news-events/matte1.htm>

Woman, Infants, and Children. (2018). *United States Department of Agriculture: Food and Nutrition Service*. Retrieved from <https://www.fns.usda.gov/wic/women-infants-and-children-wic>

World health organization. (2000). Obesity: preventing and managing the global epidemic.

Retrieved from http://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/

11 facts about hunger in the US. Retrieved from www.dosomething.org/facts/11-facts-about-hunger-us