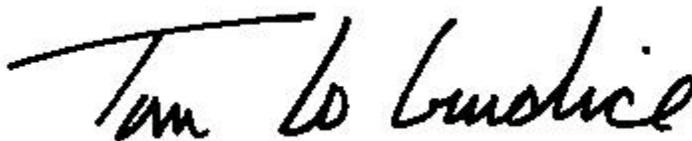


CHILDHOOD OBESITY
AND THE PHYSICAL AND PSYCHOLOGICAL
IMPACTS ON ADULTS

Approved

A handwritten signature in black ink that reads "Tom Lo Giudice". The signature is written in a cursive style with a prominent horizontal stroke at the beginning.

Paper Advisor

Date: December 15, 2009

CHILDHOOD OBESITY AND THE PHYSICAL AND
PSYCHOLOGICAL IMPACTS AS ADULTS

Seminar Paper

Presented to

The Graduate Faculty

University of Wisconsin-Platteville

In Partial Fulfillment of the

Requirement for the Degree

Master of Science

In

Education

by

Mary Lynn Knellwolf

2009

Acknowledgements

I am the Family Living Educator and Wisconsin Nutrition Education Coordinator for the University of Wisconsin Extension in Lafayette County. In my role I work with people of all ages teaching the importance of good nutrition and active lifestyles. The topic of childhood obesity and the changing trends in the last twenty years was a topic I wanted to learn more about in my career. The research conducted in the process of writing this seminar paper helped me to learn a great deal about childhood obesity and the physical and psychological impacts as adults.

I would like to thank my family for their patience and encouragement during the process of writing this paper. I would also like to thank my coworkers at UW Extension for their flexibility and technical support. Lastly, I would like to thank my professor Tom LoGuidice, who shared his wisdom and guidance and continually encouraged me throughout this project as well as in my previous graduate classes at UW-Platteville. I've discovered that with support, encouragement and hard work, wonderful things can be learned and accomplished.

Abstract

The problem presented in this paper was to identify what extent, if any, there is a relationship between childhood obesity and the long-term physical and psychological impacts on adults. A brief review of literature on childhood obesity and health consequences as adults was conducted. A second review of literature relating to research, and long-term studies was conducted. Through a review of the literature, it becomes evident that most research conducted on the long-term effects of childhood obesity is incomplete at its best. A bulk of the research conducted in the last 30 years suggests that there is a direct correlation between childhood obesity and the long-term physical and psychological health consequences as adults. Implications of the literature for educators, especially adult educators is also discussed.

TABLE OF CONTENTS

| | |
|------------------------|-----|
| APPROVAL PAGE..... | i |
| TITLE PAGE..... | ii |
| ACKNOWLEDGEMENTS..... | iii |
| ABSTRACT..... | iv |
| TABLE OF CONTENTS..... | v |

| CHAPTER | Page |
|---|------|
| I. INTRODUCTION..... | 1 |
| Statement of the Problem | |
| Purpose of the Research | |
| Significance of the Problem | |
| Assumptions | |
| Delimitations of the Research | |
| Method of Approach | |
| Definition of Terms | |
| II. REVIEW OF LITERATURE..... | 9 |
| Childhood obesity: A real problem on the rise | |
| Childhood obesity: The physical impacts as adults | |
| Childhood obesity: The psychological impacts as adults | |
| Nutrition Education and its effect on childhood obesity | |
| III. CONCLUSIONS AND RECOMMENDATIONS..... | 19 |
| IV. REFERENCES..... | 21 |

CHAPTER I

INTRODUCTION

Although studies have been going on for years, medical researchers are only gradually becoming aware of the seriousness of the risk that overweight and obesity pose for children's health. Many obesity-related health conditions such as high blood pressure and type 2 diabetes are now being seen in children with alarming frequency. Not only do overweight children suffer from physical effects, the psychological effects from teasing and bullying can be very significant leading to isolation, low self esteem, and depression.

The obesity epidemic is taking a heavy toll on the nation's children. According to the 1999-2000 National Health and Nutrition Examination Survey, approximately 15% (9 million) American children were overweight; which is triple the number who were overweight in the 1980 survey. (National Center for Health Statistics, [NCHS], 1999).

Speculation into the many causes of obesity has been narrowed down to three areas: unhealthy eating habits, lack of exercise, and genetic predisposition. In our fast paced society where everything has become a need for instant gratification, the eating patterns of Americans have changed dramatically through the years. We are a society on the go. Media messages relentlessly lure children to junk food. The thousands of fast food restaurants, including the Golden arches seem to fill the need for our hunger pangs.

So what will be the long-term impact of eating at fast food restaurants and convenience stores and leading more sedentary lifestyles have on our children? This question may not have a

pretty answer. The most recent data suggests that obesity present in childhood or adolescence seems to increase the likelihood of adult morbidity and mortality. In children, some obesity-related conditions are having an immediate adverse effect on their health, while others will have more chronic long-term effects. On a very serious note, because of overweight and obesity, today's young people may live less healthy and untimely shorter lives than their parents.

Statement of the Problem

The problem to be addressed is “To what extent is there a relationship between childhood obesity and the long-term physical and psychological impacts on adults?”

Purpose of the Research

The purpose of this research paper was to determine the cause and effect of childhood obesity on the physiological and psychological future of adults and also to discover what impact nutrition education has on childhood obesity.

Significance of the Problem

In the past 30 years there has been a dramatic increase in childhood obesity in the United States. The 1999-2000 National Health and Nutrition Examination Survey data showed that the incidence of childhood obesity nearly tripled since 1980. (NCHS, 1999).

Assumptions

For the purpose of this paper, it was assumed that all research and review of the current literature was accurately reported. It was also assumed that adults and children value their health.

Delimitations of the Research

The research will be conducted in and through the Karrmann Library at the University of Wisconsin-Platteville, over forty-five (45) days. Primary searches will be conducted via the Internet through EBSCO host with ERIC and Academic Search Elite as the primary sources. Key search topics included “childhood obesity and consequences”, childhood obesity and physical impacts”, “childhood obesity and psychological impacts”, childhood obesity and social impacts”, and “childhood obesity and prevention education”.

Method of Approach

A brief review of literature on childhood obesity and the physical as well as psychological impacts as adults will be conducted. A second review of literature relating to research, studies, and anecdotal evidence of childhood obesity and physical and psychological impacts as adults will be conducted. The findings will be summarized and recommendations made.

Definitions of Terms

(NOTE: All definitions taken from Centers for Disease Control and Prevention. Retrieved July 16, 2009 from CDC Web site: <http://www.cdc.gov/leanworks/resources/glossary.html>)

Body mass index (BMI). A measure of body weight relative to height. BMI is a tool that is often used to determine if a person is at a healthy weight, overweight, or obese, and whether a person's health is at risk due to his or her weight. To determine BMI, the following formula is used:

$$\text{BMI} = \frac{\text{Weight in pounds} \times 703}{\text{Height in inches} \times \text{Height in inches}}$$

A body mass index (BMI) of 18.5 to 24.9 is considered healthy. A person with a BMI of 25 to 29.9 is considered overweight, and a person with a BMI of 30 or more is considered obese.

Calorie. A unit of energy in food. Foods have carbohydrates, proteins, and/or fats. Carbohydrates and proteins have 4 calories per gram. Fat has 9 calories per gram.

Cholesterol. A fat-like substance that is made by the body and is found naturally in animal foods such as meat, fish, poultry, eggs, and dairy products. Foods high in cholesterol include organ meats, egg yolks, and dairy fats. Cholesterol is needed to carry out functions such as hormone and vitamin production. The cholesterol in food, like saturated fat, tends

to raise blood cholesterol, which increases the risk for heart disease. Total blood cholesterol levels above 240 mg/dl are considered high. Levels between 200 and 239 mg/dl are considered borderline high. Levels under 200 mg/dl are considered desirable.

Diabetes mellitus. A disease that occurs when the body is not able to use blood glucose (sugar). Blood sugar levels are controlled by insulin, a hormone in the body that helps move glucose (sugar) from the blood to muscles and other tissues. Diabetes occurs when the pancreas does not make enough insulin or the body does not respond to the insulin that is made. There are two main types of diabetes mellitus: type 1 diabetes and type 2 diabetes.

Diet. What a person eats and drinks. Any type of eating plan.

Energy expenditure. The amount of energy, measured in calories, that a person uses. Calories are used by people to breathe, circulate blood, digest food, maintain posture, and be physically active.

Healthy weight. Compared to overweight or obese, a body weight that is less likely to be linked with any weight-related health problems, such as type 2 diabetes, heart disease, high blood pressure, and high blood cholesterol. A body mass index (BMI) of 18.5 to 24.9 is considered a healthy weight.

High blood pressure. Another word for “hypertension.” Blood pressure rises and falls throughout the day. An optimal blood pressure is less than 120/80 mmHg. When blood pressure stays high—greater than or equal to 140/90 mmHg—you have high blood pressure. With high blood pressure, the heart works harder, your arteries take a beating,

and your chances of a stroke, heart attack, and kidney problems are greater.

High-density lipoprotein (HDL). A unit made up of proteins and fats that carry cholesterol to the liver. The liver removes cholesterol from the body. HDL is commonly called “good” cholesterol. High levels of HDL cholesterol lower the risk of heart disease. An HDL level of 60 mg/dl or greater is considered high and is protective against heart disease. An HDL level less than 40 mg/dl is considered low and increases the risk for developing heart disease.

Low-density lipoprotein (LDL). A unit made up of proteins and fats that carry cholesterol in the body. High levels of LDL cholesterol cause a buildup of cholesterol in the arteries. Commonly called “bad” cholesterol. High levels of LDL increase the risk of heart disease. An LDL level less than 100 mg/dl is considered optimal, 100 to 129 mg/dl is considered near or above optimal, 130 to 159 mg/dl is considered borderline high, 160 to 189 mg/dl is considered high and 190 mg/dl or greater is considered very high.

Metabolism. All of the processes that occur in the body that turn the food you eat into energy your body can use.

Nutrition. (1) The process of the body using food to sustain life. (2) The study of food and diet.

Obesity. Obesity is excess body fat. Because body fat is usually not measured, a ratio of body weight to height or BMI chart is often used instead. It is defined as BMI. An adult who has a BMI of 30 or higher is considered obese.

Overweight. It is defined as a body mass index (BMI) of 25 to 29.9. Body weight comes from fat, muscle, bone, and body water. It is important to remember that although BMI correlates with the amount of body fat, BMI does not directly measure body fat. As a result, some people, such as athletes, may have a BMI that identifies them as overweight even though they do not have excess body fat.

Physical activity. Any form of exercise or movement. It is recommended that adults get at least 30 minutes of moderate-intensity physical activity for general health benefits. Children should get at least 60 minutes of moderate-intensity physical activity most days of the week. Moderate-intensity physical activity is any activity that requires about as much energy as walking 2 miles in 30 minutes.

Type 1 diabetes. Previously known as “insulin-dependent diabetes mellitus,” or “juvenile diabetes.” Type 1 diabetes is a life-long condition in which the pancreas stops making insulin. Without insulin, the body is not able to use glucose (blood sugar) for energy. To treat the disease, a person must inject insulin, follow a specific eating plan, exercise daily, and test blood sugar several times a day. Type 1 diabetes usually, but not always, begins before the age of 30.

Type 2 diabetes. Previously known as “noninsulin-dependent diabetes mellitus” or “adult-onset diabetes.” Type 2 diabetes is the most common form of diabetes mellitus. About 90 to 95 percent of people who have diabetes have type 2 diabetes. People with type 2 diabetes produce insulin, but either do not make enough insulin or their bodies do not efficiently use the insulin they make. Most of the people who have this type of diabetes are

overweight. Therefore, people with type 2 diabetes may be able to control their condition by losing weight through diet and exercise. They may also need to inject insulin or take medicine along with continuing to follow a healthy program of diet and exercise. Although type 2 diabetes commonly occurs in adults, an increasing number of children and adolescents who are overweight are also developing type 2 diabetes.

Weight control. Achieving and maintaining a healthy weight by eating nutritious foods and being physically active.

CHAPTER II

REVIEW OF LITERATURE

It is the mission of the University of Wisconsin Extension to provide research-based information to families where they live and work. In a response to a request from the U.S. Congress via the Centers for Disease Control and Prevention, the National Academy of Sciences Institute of Medicine published an evidenced-based report on Preventing Childhood Obesity: Health in the Balance (2005). The report has recommendations for the federal, state and local governments, industry/media, healthcare professionals, communities, schools, parents and families. The recommendations for parents and families are to promote healthful eating behaviors and regular activity for children by: breastfeeding, educating children regarding healthy food choices and portion sizes, encouraging and supporting regular physical activity most days, limiting television viewing to less than 2 hours per day, and serving as positive role models. Although the reports used different techniques to capture the research findings that inform programming to prevent child obesity, the recommendations are consistent in many ways. They all recommend promoting more active play to replace sedentary lifestyles and providing healthful foods and beverages in appropriate portion sizes. As a University of Wisconsin Family Living Educator and Wisconsin Nutrition Education Program Coordinator this information helps to guide my educational efforts in the area of overweight and obesity and will hopefully help to bring the childhood obesity “epidemic” to an end.

Childhood Obesity: A Real Problem on the Rise

Obesity is defined as a body mass index (BMI) of 30 or greater. BMI is calculated from a person's weight and height and provides a reasonable indicator of body fatness and weight categories that may lead to health problems. According to the 1999-2000 National Health and Nutrition Examination Survey, approximately 15% (9 million) American children between the ages of 6 and 19 are overweight; which is triple the number who were overweight in the 1980 Survey (NCHS, 1999).

The burden placed on our society by obesity and related chronic diseases is enormous. In the last 20 years, obesity rates have increased by more than 60 percent in adults. More than 25 percent of the adult population in the United States is obese, or approximately 50 million adults. Obesity in the United States is truly epidemic.

Research has shown that the obesity epidemic impacts other diseases. For example, type 2 diabetes, a major consequence of obesity, also has increased rapidly over the last 10 years. Although type 2 diabetes was virtually unknown in children and adolescents 10 years ago, it now accounts for almost 50 percent of new cases of diabetes in some communities (Dietz, 2002). Obesity is also a major contributor to heart disease, arthritis, and some types of cancer. Obesity is considered one of the ten leading causes of disability and death across the globe and is estimated to claim the lives of more than a half-million adults annually (World Health Organization, 1998).

The contribution of childhood onset obesity to adult disease is even more worrisome. Although onset of obesity in childhood only accounts for 25 percent of adult obesity, obese adults who were overweight children have much more severe obesity than adults, who became

obese in adulthood (Dietz, 2002). Sixty percent of overweight children have at least one additional cardiovascular disease risk factor, and 25 percent have two or more.

The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity 2001 stated that in 2000, obesity and its complications were costing the nation \$117 billion annually. (United States Department of Health and Human Services [USDHHS], 2001). The rapid increases in obesity across the population and the burden of costly diseases that accompany obesity indicate that we should not ignore this problem. The rapidity with which obesity has increased may be explained by changes in the environment that have modified calorie intake and energy expenditure, such as increased fast food consumption and reduced physical activity. The variety of fast foods available has multiplied, and portion size has increased dramatically. Super-sized meals are commonly available and frequently used by youth and adults. Hectic work and family schedules allow little time for physical activity. Schools struggling to improve academic achievement are dropping physical education and assigning more homework, which leaves less time for sports and physical activity. The physical, emotional, and social costs of increasing rates of obesity among children are great.

Obesity is a complex problem that is still not entirely understood and that health experts say involves many different layers of society. Obesity is more than just a cosmetic concern. Obese adolescents reportedly experienced less psychosocial well-being and lower self esteem than peers that are not overweight (Mellin et al., 2002). According to the Surgeon General (USDHHS, 2001), social discrimination is perceived to be the greatest problem facing overweight children and adolescents, and is contributing to the low self-esteem and depression experienced by this population. The most alarming trend noted is that the majority of overweight adolescents will become obese adults (Bouchard, 1997; Dietz, 1998; NCHHS, 1999; Troiano &

Flegal, 1998; USDHHS, 2001). Short - and long-term physical and psychological concerns can result from childhood obesity. It has been linked to shorter life spans as children who are overweight experience physiological consequences similar to those of overweight and obese adults.

A report on the risks and consequences of childhood and adolescent obesity was reported in the *International Journal of Obesity* (Must & Strauss, 1999). This report explored the scientific literature related to consequences of childhood obesity, including conditions that occur immediately as a result of obesity in childhood and conditions that do not appear until adulthood. Immediate consequences of childhood obesity included the following (Must & Strauss, 1999): orthopedic issues, neurological concerns, sleep disorders, asthma, gallstones, and endocrine disorders such as Type 2 diabetes and metabolic syndrome. Not all overweight children experience the immediate consequences of overweight and obesity, however, the heavier the child, the more likely serious health conditions will appear in childhood and persist into adolescent and adult life.

By comparing the childhood medical records and adulthood hospital records of 276,835 Danish citizens born between 1930 and 1976, researchers found a distinct correlation between higher childhood body mass index (BMI) and a greater risk of future heart disease and heart disease-related death (Sharples, 2007). According to the author, it is the first study to conclusively link excess weight in childhood and health problems later on. What's more, the data showed that the correlation is linear and progressive: as children's BMI increased, their risk of adult heart disease rose alongside it. As research indicates, childhood obesity does in fact continue into adulthood (Dietz, 1998), increasing the prevalence of morbidity and mortality in adults. A multitude of physiological consequences are found in overweight children. The

prevalence and severity of these consequences appear to increase with the severity of overweight. Overweight and obesity clearly lead to increased morbidity in children and adults.

There has been much speculation as to the many causes of obesity. Most of the literature clearly narrows it down into three main categories; unhealthy eating habits, lack of exercise and genetic predisposition. Many children and adolescents consume unhealthy quantities of fast foods high in fat content as well as high calorie, sweetened soft drinks. Add this increased caloric intake with a sedentary lifestyle, and the results are what has been labeled, “the disease of the 21st Century” (Rossner, 2002). It has been estimated that 43% of adolescents spend more than 2 hours each day watching television in addition to the time already spent on cell phones, computers and playing video games (USDHHS, 2001). In spite of the lack of time proven studies, clinical evidence strongly indicates a direct correlation between childhood obesity and the negative physiological and psychological consequences on adults.

Childhood Obesity: The Physical Impacts as Adults

Childhood obesity is considered an important disease because of its link to long term health consequences. Specifically, studies have demonstrated associations between overweight in childhood and adolescence and all-cause mortality, heart disease morbidity and mortality, metabolic syndrome and other diseases. Obesity is related to a host of chronic diseases and many other negative health conditions that can diminish the length and quality of life. Type 2 diabetes is associated with kidney disease, blindness, and amputations. In addition to type 2 diabetes, cardiovascular disease risk factors have been observed in overweight children. These risk factors include increased total cholesterol and low-density lipoprotein or LDL, elevated triglycerides, high blood pressure, elevated insulin levels, abnormal heart functions, and the

presence of metabolic syndrome (Freedman, D. S., Dietz, W. H., Sathanur, S. R., & Berenson, G. S., 1999). The presence of these risk factors may not be outwardly noticeable during childhood but are indicators of risk for the development of cardiovascular disease in adulthood. Results of some studies suggest that more than half of obese children in elementary school have at least one cardiovascular disease risk factor, and a quarter have at least two (Reilly et al., 2003).

Research has also established a relationship between obesity and cancer. A study by Gascon, F., Valle, M. R., Zafra, M., Morales, R., & Castano, M.A. (2004) examined hormonal abnormalities in obese children and their implications on the development of cancer later in life. Researchers found that levels of certain hormones known to play a role in cancer development are very high in obese children. Although the high hormone levels may not produce cancer in childhood, they are risk factors for cancer development and increase the likelihood of an overweight child developing cancer in adulthood.

Childhood Obesity: The Psychological Impacts as Adults

In addition to all the physical health problems associated with childhood overweight and obesity, a growing body of research indicates that the psychosocial and psychological well being of children are adversely affected as well. Obesity is one of the most stigmatizing and least socially acceptable conditions in childhood (Schwimmer et al., 2003). Young children are often stigmatized because of obesity and such behaviors can start at ages as young as 3-5 years (Zametkin, A., Zoon, C., Klein, H., Munson, S. 2004). Obese children are often teased and are targets of bullying. Stigmatization could have a marked impact on childhood psychological development, and could explain some of the psychological disorders obese children experience such as; depression, suicidal thoughts, and suicide attempts (Zametkin et al., 2004).

Additionally, research indicates that overweight children are also prone to dieting, skipping meals and prolonged television watching. Overweight children often rated their school performance poorly (Puhl, R. M., Brownell, K. D., 2003). Furthermore, the studies also indicate that obese children experience social isolation such as rejection by their peers. Sadly, the teasing, harassment and rejection associated with stigmatization has long-term consequences.

Obese adults tend to face disparate treatment in educational settings and the workplace, and have higher poverty rates and lower marriage rates (Puhl et al., 2003; Zametkin et al., 2004). Obese children and adolescents reported significantly lower health-related quality of life than their normal-weight counterparts, and they were five times more likely to have impaired quality of life (Schwimmer, J.B., Burwinkle, T.M., Varni, J.W., 2003). In fact, the health –related quality of life for obese children and adolescents was similar to that of children diagnosed with cancer. Clearly, the psychological impact of childhood overweight and obesity is great and needs to be studied further in order to provide optimal emotional support and guidance in the future.

Nutrition Education and its Effect on Childhood Obesity

Childhood obesity and its long-term effects definitely gives credibility to the motto that prevention is the key. Nutrition education can begin long before the problem exists by educating individuals about the facts of caloric needs. Prevention of childhood obesity can begin prior to conception. This can be done by educating future parents of the risks of high birth weight, maternal diabetes and obesity among family members (Anrig, 2003). Some researchers believe nutrition education should start as early as the time of conception when mothers need to eat well

and have a good understanding of nutrition for their child's proper growth and development in the womb.

Overall, there are a variety of factors that play a role in obesity. This makes it a complex health issue to address. It seems rather simple, overweight and obesity result from an energy imbalance of eating too many calories and not getting enough physical activity. Any excess calories not used for fuel over time, can accumulate and add extra pounds to an individual's weight. Calories in must equal calories out. But is it really that simple? Body weight is the result of genes, metabolism, behavior, environment, culture and socioeconomic status (Centers for Disease Control, 2009). Behavior and environment play a large role causing people to be overweight and obese and that is why they are the greatest areas for prevention and treatment actions according to The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity 2001 (USDHHS 2001).

Large gaps in teens' understanding of energy balance concepts were identified in a recent study from the University of Minnesota (Nelson, M.C., Lytle, L.A., Pasch, K.E., 2009). Nelson and colleagues collected and analyzed data from 349 adolescents and their parents in 2006-2007 to determine whether their knowledge of energy intake and expenditure was related to eating behaviors and body weights/BMIs. The knowledge test in this study included 15 questions about energy intake and expenditure. Confusion about energy (calories) from nutrients was common as was knowledge of the Dietary Guidelines for Americans. Many teens in this study lacked basic knowledge that is necessary to understand and follow advice in the Dietary Guidelines for Americans and monitor their intake of calories and nutrients. This verifies the importance of effective, behaviorally-oriented nutrition education.

An article published in the *Journal of Nutrition Education and Behavior* (Howerton et al., 2007) indicated that school-based nutrition education produced a moderate increase in fruit and vegetable intake among children. The authors noted challenges with evaluating the impact of nutrition education on children and with accurately measuring and comparing children's dietary behaviors. The authors looked at both the individual and combined results of seven studies. The purpose of their project was to evaluate whether school-based nutrition interventions have an effect on child fruit and vegetable consumption. Their original search of studies published between January 1990 and December 2002 yielded 896 unduplicated records. The 13 studies focused specifically on children between the ages of 5 and 18 years. Seven of the authors of the 13 studies shared their data for inclusion. The average classroom intervention was 2 years in duration but ranged in length from 2 months to 3 years. All of the studies were theory-based and implemented at least 2 strategies to deliver the nutrition education with 1 strategy being a classroom component. Six of the studies included a family component, 4 included a food-service component, 2 included a community component, and 1 included a media campaign. The authors conclude that combined data for these 7 studies showed moderate increases in fruit and vegetable consumption among children who participated in these published nutrition education intervention programs. This study supports the role of school based nutrition education in increasing children's fruit and vegetable intake. It highlights the need for good evaluation measures and tools to capture the impact of this education. Studies such as this one present credible evidence that counters recent media stories that belittle nutrition education (Mendoza, 2007).

Helping overweight or obese children lose weight has been shown to be effective when there is a team approach. According to the American Obesity Association (2002), families are the primary role models for children when it comes to eating habits and levels of activity.

Researchers agree that long-term and short-term success rates are much higher when families are involved in educational programs designed to modify eating habits and increase activity levels (Zametkin, A., Zoon, C., Klein, H., Munson, S. 2004). Parents, pediatricians, dieticians, schools and communities can all play a part in nutrition education that can benefit children and entire families.

Clearly psychological, physiological and nutritional aspects of the problems associated with obesity need to be addressed within the parameters of dietary education. Multidisciplinary work building from many disciplines concerned with obesity risk and prevention such as; genetics, social ethics, economics, psychology, nutrition, and political science is needed in order to establish a structured and comprehensive solution to the complex problem of childhood obesity.

CHAPTER III

CONCLUSIONS AND RECOMMENDATIONS

The consequences of overweight and obesity in childhood, including persistence into adulthood and as a risk factor for adverse health consequences, are of substantial concern given the recent upward trend of prevalence in the United States. Few studies have examined the long-term effects of childhood obesity on adult disease. In part, the lack of such studies reflects the difficulties in the maintenance of a cohort for the time necessary for adult disease to occur. Nonetheless, obesity present in childhood or adolescence seems to increase the likelihood of adult morbidity and mortality. Psychosocial consequences such as fewer years of education, higher rates of poverty, and lower rates of marriage and household income are also associated with obesity. A recent article in the *New England Journal of Medicine* (Olshansky, 2005) raised the alarming possibility that the increasing prevalence of severe obesity in children may reverse the modern era's steady increase in life expectancy, with the youth of today on average living less healthy and ultimately shorter lives than their parents. Preventing childhood obesity is thus of urgent importance.

As a society, there is a need to tackle the problem of childhood obesity. To prevent this problem, all people need to establish healthy eating habits early in development. Parents need to set good examples for children by modeling healthful eating behaviors and being physically active. Adults can be effective advocates by becoming involved in efforts in their neighborhoods, schools, and communities to improve neighborhood safety and to expand the access and availability of opportunities for physical activity and healthful eating such as

recreational facilities, playgrounds, sidewalks, bike paths, and the increasingly popular farmers' markets.

The increase in childhood obesity cases can be mainly attributed to more sedentary lifestyles and unhealthy diets. The array of sedentary pastimes such as television, computers, and video games has led to a severe lack of physical activity among children. Intervention will require a nationwide effort to educate a society that has become acclimated to instant gratification and quick and easy routines.

References

- American Obesity Association. (2002). Childhood obesity. Retrieved July 17, 2009, from American Obesity Association Web site: <http://www.obesity.org/subs/childhood/>
- Anrig, C. D., (2003). The obese child. *Dynamic Chiropractic*, 21, 27-31.
- Bouchard, C. (1997). Obesity in adulthood: The importance of childhood and parental obesity *The New England Journal of Medicine*, 337, 926-927.
- Centers for Disease Control and Prevention. (2009). Is there a quick answer to the question, "what contributes to overweight and obesity?" Retrieved July 10, 2009 from CDC Web site: <http://www.cdc.gov/obesity/causes/index.html>
- Dietz, W.H. (1998). Childhood weight affects adult morbidity and mortality. *The Journal of Nutrition*, 128, 411S-414S.
- Dietz, W. H. (2002). CDC's role in combating the obesity epidemic. Address before the Senate Committee on Health, Education, Labor and Pensions. Retrieved July 17, 2009, from Web site: <http://www.hhs.gov/asl/testify/t020521a.html>
- Freedman, D. S., Dietz, W. H., Sathanur, S. R., & Berenson, G. S. (1999). The relation of overweight to cardiovascular risk factors among children and adolescents: The Bogalusa Heart Study. *Pediatrics*, 103(6), 1175-1182.
- Howerton, M. W., Bell, S., Dodd, K. W., Berrigan, D., Stolzenberg-Solomon, R., & Nebeling, L. (2007). School-based nutrition programs produced a moderate increase in fruit and vegetable consumption: meta and polling analyses from 7 studies. *Journal of Nutrition Education and Behavior*, 39, 186-196.
- Institute of Medicine. Preventing childhood obesity: health in the balance, 2005. Retrieved July 16, 2009, from Institute of Medicine Web site: <http://www.iom.edu>.
- Mellin, A., Neumark-Sztainer, D., Story, M., Ireland, M., & Resnick, M. (2002). Unhealthy behaviors and psychosocial difficulties among overweight adolescents: The potential impact of familial factors. *Journal of Adolescent Health*, 31, 145-153.
- Mendoza, M. (2007). Review finds nutrition education failing. AP News Release July 4, 2007. Retrieved July 10, 2009 from FOXNEWS.COM Web site: <http://www.foxnews.com/story/0,2933,288174,00.html>

- Must, A., Strauss, R. Risks and consequences of childhood and adolescent obesity. (1999). *International Journal of Obesity and Related Metabolic Disorders*, 23, Suppl-11.
- National Center for Health Statistics. (1999). Prevalence of overweight among children and adolescents. Retrieved July 17, 2009, from National Center for Health Statistics Web site: <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/overwght99.htm>.
- Nelson, M. C., Lytle, L.A., Pasch, K.E. (2009). Improving literacy about energy –related issues: the need for a better understanding of the concepts behind energy intake and expenditure among adolescents and their parents. *Journal of the American Dietetic Association*, 109, 281-287.
- Olshansky, S. J. et al. (2005). A potential decline in life expectancy in the United States in the 21st Century. *New England Journal of Medicine*, 352(11), 1138-45.
- Puhl, R. M., Brownell, K. D. (2003). Psychosocial origins of obesity stigma: toward changing a powerful and pervasive bias. *Obesity Reviews*, 4, 213-227.
- Reilly, J., Methven, E., McDowell, Z., Hacking, B., Alexander, D., Stewart, L., & Kelnar, C. Health consequences of obesity. (2003). *Archives of Disease in Childhood*, 88(9), 748-752.
- Rosner, S. (2002). Obesity: The disease of the twenty-first century. *International Journal of Obesity*, 26(4), 2-4.
- Schwimmer, J. B., Burwinkle, T. M., Varni, J. W. (2003). Health-related quality of life of severely obese children and adolescents. *Journal of the American Medical Association*, 289(14), 1813-1819.
- Sharples, T., (2007). Lifelong effects of childhood obesity. TIME. Retrieved July 15, 2009 from TIME Web site: <http://www.time.com/time/health/article/0,8599,1692184,00.html>
- Troiano, R. P., Flegal, K. M. (1998). Overweight children and adolescents: Description, epidemiology, and demographics. *Journal of Pediatrics*, 101, 497-504.
- U. S. Department of Health and Human Services. (2001). The Surgeon General's call to action to prevent and decrease overweight and obesity. U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, Rockville, MD. Available from: US GPO, Washington.
- WHO. World Health Organization. (1998). Obesity: Preventing and managing the global epidemic. Geneva, Switzerland: World Health Organization, Division of Noncommunicable Diseases.
- Zametkin, A., Zoon, C., Klein, H., Munson, S. (2004). Psychiatric aspects of child and adolescent obesity: a review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 43(2), 134-150.