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The Psychological Implications of Obesity in Adolescent High School Students

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Abstract

This research project set to answer the questions: Are obese adolescents at risk for short-term and long-term physical health problems? Are obese adolescents at risk for increased depression, decreased self-esteem, increased suicidal thoughts and/or actions, increased peer victimization and detrimental effects to various psychosocial outcomes? A survey, which included The Rosenberg Self-Esteem Scale and The Center for Epidemiological Studies Depression Scale for Children (CES-DC), was given to male and female students, ages 15-17, currently enrolled in a high school health class. The results of this research project were inconclusive, as this researcher was unable to conduct a comparison study between obese and normal weight students as all students that participated were either normal weight or underweight. However, the findings support the literature that was reviewed in that the importance of obesity as an epidemic, the physical health risks associated with obesity and the association of obesity with psychological aspects of mental health, i.e. depression, self-esteem, increased suicidal thoughts and/or actions, peer victimization and psychosocial outcomes in adolescents were all supported.

The Psychological Implications of Obesity in Adolescent High School Students

In 2004, Inge, Krebs, Garcia, Skelton, Guice, Strauss, Albanese, Brandt, Hammer, Harmon, Kane, Klish, Oldham, Rudolph, Helmrath, Donovan and Daniels found that obesity is becoming a concern of epic proportions in the United States, as well as in nations around the world. Inge et. al (2004) also found that the nation's children and adolescents are at greater risk for physical and psychological problems as a result of being overweight or obese. Due to research that has found obesity to be an epidemic sweeping our nation, the psychological implications of adolescent obesity are important to consider and research further. Given the increasingly alarming rates of obesity in the United States, especially in the youth and adolescents of the United States, and the growing physical and psychological health concerns and costs for those with obesity it is important to examine the impact that obesity has on the physical, psychological and emotional development of adolescents. The purpose of this research project is to take a closer look at obesity as an epidemic. This research project will also examine the association between obesity and physical health, self-esteem, peer victimization, psychological health, and psychosocial outcomes in adolescents. This research also examines the questions: Are obese adolescents at risk for short-term and long-term physical health problems? Are obese adolescents at risk for increased depression, decreased self-esteem, increased peer victimization and detrimental effects to various psychosocial outcomes?

Review of the Literature

Relevant Scholarship

The research that has been published on this topic either supports the idea that obesity has psychological and/or physical implications to those that suffer from it such as Reilly (2007), Adams and Bukowski (2008), Bassett and Perl (2004), and Davis and Carpenter (2009) whom all

found that obese adolescents suffer from significant psychological and/or physical problems or indicated that there is no correlation between obesity and psychological and physical effects such as the findings of Flodmark (2005), and Wardle, Williamson, Johnson and Edwards (2006). This project will review the literature of obesity as an epidemic, the physical health consequences of obesity in adolescents, the impact obesity has on depression symptoms in adolescents, the impact adolescent obesity has on self-esteem, the risk of obese adolescents and suicide, peer victimization and obesity and the impact of obesity on various psychosocial outcomes of obese adolescents

Definition and measurement of obesity. One of the difficulties of defining obesity and the measurement of obesity are the inconsistent definitions and the different measurements that are used to define and measure obesity (Sweeting, 2007). Obesity is defined by some researchers as excess body fat or adipose tissue (Prentice & Jebb, 2001). In considering how much fat should be considered obese, it was found that thirty percent of fat in female children and adolescents was considered obese and twenty to twenty-five percent of fat in male children and adolescents was considered obese (Williams, Going, Lohman, Harsha, Srinivan, Webber, & Berenson, 1992; Dwyer and Blizzard, 1996). Similar to the findings of Prentice and Jebb (2001), Reilly (2007) defined obesity as "a disorder in which the body fat has become so high that it creates health problems or increased risk for health problems" (p. 390). Although there are some structured definitions of obesity, it is also common for obesity to be defined by the way in which it is measured.

A common way obesity is defined is through the measurement by which obesity is assessed, such as the measurement of Body Mass Index (BMI). For example, Reilly (2007) defined how overweight and obesity are measured in children and adolescents (and adults) as

"body mass index (BMI), i.e. weight (in kg) divided by height squared (m squared)" (p. 390). Duncan S, Duncan E., Schofield (2009), Must and Anderson (2006), Pyle, Sharkey, Yetter, Felix, Furlong and Poston (2006), Garrow and Webster (1985) and Sweeting (2007) also defined obesity within the measurement of BMI or weight (kg) divided by height squared (m squared). Must and Anderson (2006) explained that, in using BMI with children and adolescents, "it must be compared to a reference-standard that accounts for child age and sex" (p. 590). Based on data collected between 1963 and 1964, obesity in children and adolescents is assessed using BMI charts for age and sex (Kuczmarski, Mei, Guo, & Grummer-Strawn, 2000; Ogden, Flegal, Carroll, & Johnson, 2002). BMI is further interpreted using charts (similar to growth charts) by measuring weight and height, calculating BMI and plotting on the appropriate chart (Reilly, 2007). The use of the BMI for age and sex chart is widely encouraged and supported by a vast array of researchers and organizations, such as the American Medical Association, the American Academy of Pediatrics, the Center for Disease Control and the International Obesity Task Force (Barlow and Dietz, 1998; Bellizzi and Dietz; 1999, Himes and Dietz, 1994).Obesity and overweight in children and adolescents are further defined using specific age and sex BMI percentiles.

The most commonly used assessment tool for identifying age and sex BMI percentiles in children and adolescents is the growth chart developed by the US Centers for Disease and Control Prevention (CDC) (Cole, Bellizzi, Flegal, & Dietz, 2000). Pyle et al. (2006) defined "underweight as classified at or below the 5^{th} percentile, at risk for overweight being between the 85^{th} and 95^{th} percentile and overweight being at or above the 95^{th} percentile" (p. 362). Additionally, children and adolescents are considered obese if they have a BMI that is high for their age and if their BMI, when calculated, is above the 95^{th} percentile (Reilly, 2007). Dietz et

al. (2005) also discussed that children are "overweight" if their BMI is over the 95th percentile for their age and height (p. 2101). Similarly, children and adolescents are determined overweight if BMI, after being calculated, is found to be in or above the 91st percentile and BMI is slightly lower for age (Reilly, 2007). Dietz et al. (2005) noted the term "at risk for overweight" is applied to children or adolescents whose body-mass index is between the 85th and 95th percentiles" (p. 2101). Reilly (2006) found that children whose BMI fell above the 95th or 98th percentile were "consistently the fattest children and adolescents in the population and are at highest risk of the medical and other problems associated with obesity" (p. 595). A child or adolescents body mass index at or above the 95th percentile was also indicative of increased body fat (Dietz et al., 2005). It is also important to note that Reilly (2007) found "almost all children and adolescents with a high BMI for their age are excessively fat" (p. 391). Reilly (2007) found "many children and adolescents have relatively low BMI percentiles that are below our definitions of overweight and obesity, but are excessively fat" (p. 595-597). In a survey done in the UK in 2004 Reilly (2007) found "obesity prevalence (defined as BMI greater then the 95th percentile) was 14 per cent in two to 10 year-olds and a staggering 25% in 11-to 15 year-olds" (p. 595-597). Reilly (2007) found "obesity in childhood and adolescence does matter in the short-term (for the obese child) and long-term (for the adult who was obese as a child)" (p. 391). BMI and BMI for age and sex growth charts are the most commonly used tools for assessing obesity in children and adolescents. However, there are more ways in which to measure obesity.

In addition to using BMI as a measurement and way in which to define obesity, obesity can also be measured using the age-specific BMI curves, developed by the International Obesity Task Force (IOTF), which pass through the adult standards for overweight and obesity (25 kg/m squared and 30 kg/m squared) (Cole et al., 2000). Another measurement of obesity is Rohrer's

Ponderal Index (Rohrer's Index-RI, Ponderal Index-PI) (Cole, Henson, Tremble, & Colley, 1997), which assesses obesity as weight/height to the third power (Sweeting, 2007). Mei, Grummer-Strawn, Pietrobelli, Goulding, Goran, and Dietz (2002), and Valdez, Greenlund, Wattigney, Bao and Berenson (1996) have found that because the Rohrer's Ponderal Index predicts percentage of body fat in children and adolescents and the long-term associations with adult obesity, it is comparable to the measurement of BMI. Ben's Index is a final measurement of obesity (Sweeting, 2007). Ben's index, which uses weight/height to the power of p, as a measurement of weight, is explained by Cole et al. as "where the power p is chosen so the index is independent of height" (p. 289). Furthermore, Ben's index is not often used due to the fact that calculations are difficult as the power of p is not constant nor is the power of p always a whole number (Chinn, Rona, Gulliford, Hammond, 1992; Poskitt, 1995). Given that there are several different ways in which to define and measure obesity, it is important to take a closer look at the increasing incidence of obese (and overweight) children and adolescents and how the increased incidence of obesity is effecting the nation as a whole.

Obesity as an epidemic. Inge, Krebs, Garcia, Skelton, Guice, Strauss, Albanese, Brandt, Hammer, Harmon, Kane, Klish, Oldham, Rudolph, Helmrath, Donovan and Daniels (2004) found obesity is an epidemic sweeping the adolescents and children of the United States. Due to the obesity epidemic, overweight and obesity are being considered a public health issue in the United States (Hedley, Ogden, Johnson, Carroll, Curtin & Flegal, 2004). Inge et. al. (2004) found "15.5% of children and adolescents are obese" (p. 217). Swallen, Reither, Haas and Meier (2005) found "between 1986 and 1998 the prevalence of overweight and obesity increased among children and adolescents by 120% for blacks and Hispanics and 50% for whites" (p. 340). Nead, Halterman, Kaczorowski, Auinger and Weitzman (2004) have found "more than 1 of 7

children is overweight" (p. 104). Nead et al. (2004) also found a "3-fold increase in overweight prevalence in the past 3 decades, from ~4% to ~15% among children and adolescents 6 to 10 years of age (p. 104). In children ages four to twelve years old there has been an increase in severity of overweight in the past twenty years (Nead, K., et al., 2004). Hedley, Ogden, Johnson, Carroll, Curtis and Flegal (2004) found "among children aged 6 through 19 in 1999-2002, 31.0% were at risk for overweight and 16.0% were overweight" (p. 2847). Davis and Carpenter (2009) have found "more than 9 million US children and adolescents are obese and just as many are at risk of becoming obese" (p. 505). Not only have the number of obese adolescents in the United States increased, so to have the physical health problems related to obesity increased among obese adolescents.

It is estimated that 50-77% of children and adolescents found to be obese, carry obesity into adulthood, putting them at risk for serious and life-threatening conditions (Inge, T. et al., 2004). Swallen et. al. (2005) reported "researchers, physicians, and parents have become increasingly concerned about both the short and long-term health consequences of childhood and adolescent obesity" (p. 340). Inge et. al. (2004) identified some of the serious and life-threatening conditions that those with obesity are at risk for as "premature death, heart disease, obstructive sleep apneoa, hypertension, dyslipidemia, type 2 diabetes which can also result in cardiac, renal and ophthalmic complications" (p. 217). Nead et. al. (2004) found obese children and adolescents to be at risk for iron deficiency two times more than their normal weight peers. Nead et al. (2004) found "almost 1 of every 10 overweight adolescents was iron-deficient" (p. 106). Davis and Carpenter (2009) identified asthma, hypertension, type 2 diabetes and cardiovascular disease as health risks associated with obesity. Nead et. al (2004) found iron deficiency to "have been linked to behavioral and learning problems among children and

adolescents" (p. 104). Additionally, Inge et. al. (2004) found obesity to be linked to "pseudotumor cerebri, steatohepatitis, slipped capital femoral epiphysis, Blount's disease, cholethiasis, polycystic ovary syndrome and early severe degenerative joint disease. Along with the physical health problems that obesity causes obese adolescents, they also face various psychological problems as well.

It has also been found that obese children suffer from lower scores for quality of life when compared to their normal weight peers (Inge, T., et al., 2004). Swallen et al. (2004) found that higher Body Mass Index (BMI) has an impact on health-related quality of life (HRQOL) which assesses well-being (including physical, functional, psychological and social well-being). Davis and Carpenter (2009) identified depression as a psychological health risk associated with obesity. Inge et al. (2004) also pointed to treatment for obesity as an alternative for "escaping the devastating physical and psychological effects of obesity" (p. 218). Swallen et al. (2005) found the stigma related to obesity, depression and self-esteem to negatively impact psychosocial outcomes of developing adolescents. Swallen et al. (2005) also found that obesity during adolescence "became a stronger predictor of poor psychosocial outcomes" (p. 341). It is clear, in reviewing various research, such as Swallen et al. (2005) and Davis and Carpenter (2009), that obese adolescents are at risk for numerous physical health problems as well as psychological problems. It is important to further explore the problems obesity causes.

Overview of problems obesity causes. There are several problems, both physical and psychological, that have been found to be related to adolescent obesity. For example, orthopaedic problems (specifically problems with the foot and hip), symptoms of asthma and psychosocial consequences due to the teasing and stigmatization experienced by obese persons have been identified as the most common complications of obesity (Reilly, 2007). Obese

children and adolescents face problems with their cardiovascular system, abnormal blood lipid profile, chronic low-grade inflammation and high blood pressure as some of the physical health consequences of obesity (Reilly, 2007). Korner, Kratzsch, Gausche, Bluher, Kapellen, Pulzer, Behrens and Kiess (2008) noted "childhood obesity is associated with sleep-disordered breathing" (p. 237) and the increasing incidence of metabolic syndrome. Problems with metabolism of glucose and risk of type 2 (non-insulin-dependent) diabetes are two additional physical health problems overweight and obese adolescents face (Reilly, 2007). Reilly (2007) found "adolescents now account for a high proportion of newly diagnosed type 2 diabetes" (p. 391). Chang, Woo, Sung, Kim, Kang, Su Ju and Park (2008) also noted that the increasing prevalence of obesity in children and adolescents is related to problems, such as type 2 diabetes and additionally acanthosis nigricans (AN). Additionally, Dietz (2004) found childhood and adolescent obesity to be related to the development of type 2 diabetes as well as hypertension and hypercholesterolemia. It is also noted that obese children and adolescents are at increased risk for developing type 1 diabetes (non-insulin dependent or 'childhood onset' diabetes) (Reilly, 2007). These problems that manifest in childhood and adolescence can have serious health implications in adulthood.

Research has found that obesity problems in childhood and adolescence have carried into adulthood, putting adults that were obese as children and adolescents at risk for premature mortality and impaired social, educational and economic prospects (Reilly, 2007). Reilly (2007) found "70 percent of contemporary obese adolescents will remain obese and so become obese adults" (p. 391). Manson and Bassuk (2003) and Fontaine, Redden, Wang, Westfall and Allison (2003) also found that due to obesity lasting through adolescence and into adulthood, obese adults will also be at increased risk for cardiovascular disease, osteoarthritis and different types

of cancer. Further research and review of the effects of childhood and adolescent obesity suggested, liver disease ('fatty liver') and cancer have been found to be two additional consequences to childhood obesity (Reilly, 2007). Reilly (2007) notes "there is a large body of evidence that parents and (health and education) professionals underestimate the importance of obesity in children and adolescents, and are often ignorant of the effects of obesity" (p. 391). Research indicates that obesity is directly related and causal of a large number of physical health problems, not only in adults, but in children and adolescents as well.

Physical health consequences of obesity. Health problems associated with adult obesity are also being seen in increasing frequency in children (Daniels, 2006). Daniels (2006) found "high blood pressure, early symptoms of hardening of the arteries, type 2 diabetes, nonalcoholic fatty liver disease, polycystic ovary disorder, and disordered breathing during sleep" (p. 47) as some of the obesity-related problems in childhood and adolescence. Daniels explained that development of heart disease is accelerated by being overweight during childhood and the cardiovascular system can be harmed by being obese (Daniels, 2006). Daniels found the processes that can take decades to progress to the point of disease and can lead to a heart attack or stroke are accelerated by childhood and adolescent obesity (Daniels, 2006).

Daniels (2007) noted the "same generalization applies to other obesity-related disorders-metabolic, digestive, respiratory, skeletal and psychosocial" (p. 47). It has been found that obese children are experiencing an immediate adverse effect on their health and still other obese children will experience the long- term effects of obesity-related conditions (Daniels, 2006). Daniels (2006) noted "even when the disorders do not present themselves in childhood, childhood obesity or overweight increases the risk of their developing in adulthood" (p. 48).

Daniels (2006) has found "because of overweight and obesity today's young people may, on average, live less healthy and ultimately shorter lives than their parents" (p. 48).

Children with a BMI at or above the 90th percentile have been found to have increased risk of elevated blood pressure, or hypertension, which is a large risk factor for heart attack or stroke (Daniels, 2006). Daniels (2006) found "the risk of elevated blood pressure ranges from 2.5 to 3.7 times higher for overweight children" (p. 50). It has been found that for children that are obese in childhood, and continue obesity into adulthood, have higher blood pressure than their normal weight peers (Daniels, 2006). In particular, high blood pressure (or hypertension) has been linked to left ventricular hypertrophy and athersclerosis. Daniels (2006) explained "left ventricular hypertrophy may thus be another important pathway by which obesity can increase the future risk of cardiovascular disease in children" (p. 50). Obese children and adolescents are at risk for developing cardiovascular disease.

Kahn, Buse, Ferrannini and Stern (2005) found that obese children and adolescents are at increased risk for developing cardiovascular disease. In a study of obese adolescents, conducted by Reinehr, Andler, Denzer, Siegried, Mayer and Wabitsch (2005), cardiovascular risk factors, such as dyslipidemia and hypertension, were found in one third of overweight and obese participants. Reich, Muller, Gelbrich, Deutscher, Godicke and Kiess (2003) also found that when children become overweight, the prevalence and levels of hypertensive blood pressure also increased. Additionally, it has been found that athersclerosis, the hardening of the arteries, is the most important process for developing cardiovascular disease, which obese persons are at increased risk for (Daniels, 2006).

Daniels (2006) described the process of atherosclerosis as "begins as a fatty streak on the artery's inner lining and progresses into fibrous plaque (a raised lesion)" (p. 50). The flow of

blood to the heart or brain is eventually blocked by this process which causes a heart attack or stroke (Daniels, 2006). Given that overweight is a risk factor linked to several cardiovascular problems, it would also seem obvious to determine "obesity is detrimental to the heart and blood vessels even in the very young children" (Daniels, 2006, p. 51). Obesity in children and adolescents is also related to increased risk for the development of metabolic disorders.

Other health problems closely related to overweight and obesity in children and adolescents are metabolic disorders (Daniels, 2006). Metabolic syndrome, which includes several risk factors such as increased waist circumference, elevated blood pressure, increased triglyceride, decreased HDL cholesterol concentrations and raised blood sugar levels, have been found in 30 percent of obese children and is linked to cardiovascular disease (Daniels, 2006). Reaven (1988) was the first researcher to introduce metabolic syndrome and the definition of metabolic syndrome. Reaven (1988) defined metabolic syndrome as hyperinsulinemia occurring simultaneously with other cardiovascular risk factors, resulting in increased cardiovascular morbidity. Reaven (1988) noted, early on, the common components of obesity and insulin resistance in the development of metabolic syndrome.

Building on the findings of Reaven (1998); Alberti and Zimmet (1998), and Grundy, Cleeman, Daniels, Donato, Eckel, Franklin, Gordon, Krauss, Savage and Smith (2005), all redefined and further developed the concept and definition of metabolic syndrome. Additionally, Hensen (1999) defined metabolic syndrome as a combination of risk factors, such as obesity, insulin resistance, glucose intolerance, hypertension and dyslipidemia. Some examples of risk factors to metabolic syndrome, as found by Korner, Kratzsch, Gausche, Bluher, Kapellen, Pulzer, Behrens and Kiess (2008), are "impaired glucose tolerance, hypertensive blood pressure levels, dyslipidemia and hyperuricemia" (p. 238). It is important to further examine more

common risk factors related to the development of metabolic syndrome such as insulin resistance and type 2 diabetes (Daniels, 2006).

A concern for obese children and adolescents is insulin resistance, which is the process in which the action of insulin is retarded (Daniels, 2006). In a study of metabolic pathology in obese children and adolescents, Korner et al. (2008), found one third of obese participants showed "signs of increased insulin resistance" (p. 238). Similarly, Sinha, Fisch, Teague, Tamborlane, Banyas, Allen, Savoye, Rieger, Taksali and Barbetta (2002), Reinehr, Roth, Menke a nd Adnler (2004), and Wiegand, Maikowski, Blankenstein, Biebermann, Tarnow, and Gruters (2004) also found increased incidence of insulin resistance in obese adolescents. It is unknown to researchers what the precise mechanism of insulin resistance is, however, it is known that insulin resistance occurs more commonly in the context of obesity (Daniels, 2006). Daniels (2006) found that insulin resistance "results in increased insulin secretion by the pancreas and increased circulating levels of insulin" (p. 52). Increased insulin secretion and increased circulating levels of insulin can cause increased blood pressure and cholesterol levels, all of which are risk factors for metabolic syndrome (Daniels, 2006).

Type 2 diabetes is also related to insulin resistance, has been found to have increased in adolescents (Daniels, 2006). Daniels (2006) noted a concern with the dramatic increase in childhood and adolescent obesity and the incidence of insulin resistance in obese adolescents, is type 2 diabetes which is now being diagnosed in children as young as 8 years of age. In 1982 and 1994 the incidence of type 2 diabetes increased tenfold (Daniels, 2006) and the American Diabetes Association found that newly diagnosed cases of type 2 diabetes accounted for 45 percent (Daniels, 2006). Since type 2 diabetes has been linked to increased risk of heart attack or

stroke, obese adolescents with metabolic disorders are also at increased risk for developing problems with their pulmonary system.

Asthma, a common childhood respiratory disease, has increased dramatically in the past decades with the increase of prevalence and severity of childhood obesity (Daniels, 2006). Since being overweight and/or obese are associated with increased inflammation in the lungs, increased adipose mass and an excess of abdominal fat, overweight and obese children, above the 85th percentile, have been linked to an increased risk of asthma irregardless of age, sex, ethnicity, socioeconomic status or exposure to cigarette smoke (Daniels, 2006).

Obesity in children and adolescents is also related to obstructive sleep apnoea, another disorder of the pulmonary system. Kahn et al. (2005) noted obese children and adolescents are at increased risk for sleep apnoea. Obstructive sleep apnoea or symptoms related to obstructive sleep apnoea, or "an abnormal collapse of the airway during sleeping, which results in snoring irregular breathing and disrupted sleep patterns" (Daniels, 2006, p. 54), has been found in one-third of overweight children (5 percent of overweight children were found to have obstructive sleep apnoea) (Daniels, 2006). In addition, the symptoms of obstructive sleep apnoea, can result in daytime sleepiness, decreased physical activity, learning disabilities and memory defects (Daniels, 2006).

Furthermore, the cardiovascular systems of overweight and obese children with obstructive sleep apnea, or symptoms of obstructive sleep apnea, are further stressed. Daniels (2006) found "in the short term, episodes of low oxygen levels in the blood cause temporary increases in blood pressure in the pulmonary artery and decrease blood flow in areas of the heart" (p. 54). Should obstructive sleep apnea persist, overweight and obese children are at risk for long-term cardiovascular risks such as elevated blood pressure during the day, increase in left

ventricular mass and inability of the heart to relax and fill with blood appropriately (Daniels, 2006). Overweight and obesity in children and adolescents has also been linked to various disorders of the gastrointestinal system.

It has not always been thought that obesity can affect the gastrointestinal system, however, recent research verified by Daniels (2006) found that "obesity can contribute to liver disease and gastroesophageal reflux disease (which causes the stomach's contents to flow back into the esophagus)" (p. 54). Research, in adults, has shown obesity is linked to deposits of fat into the liver, which is the cause of two gastrointestinal disorders, nonalcoholic fatty liver disease and nonalcoholic steatohepatitis (Daniels, 2006). Similar to Daniels, Korner et al. (2008) noted specific concern about the development of non-alcoholic steatohepatitis (NASH) in obese adolescents. It is estimated that "50 percent of obese children may have fat deposits in their livers while some 3 percent of obese children have the more advanced nonalcoholic steatohepatitis" (Daniels, 2006, p. 55).

In a studies of obese adolescents conducted by Zou, Liang, Hong, Fu and Zhao (2005) and Chan, Li AM, Chan, Wong, Liu, Chan, Lam, and Fok (2004) non-alcoholic fatty liver was found in fifty-five to seventy-seven percent of obese participants and twenty-four percent of obese participants already suffered from non-alcoholic steatohepatisis prior to participating in their studies. McCullough (2006) also found non-alcoholic steatohepatitis can lead to the development of cirrhosis later in life. Furthermore, Daniels (2006) noted "nonalcoholic fatty liver disease is the most common form of liver disease in children and adolescents" (p. 55). It has also been found those with the nonalcoholic fatty liver disease also have insulin resistance, which has been linked to obesity, and insulin resistance is closely linked with the severity of liver disease (Daniels, 2006). McCullough (2006) also noted that some obese individuals with

non-alcoholic steatohepatitis will experience liver-related death. Obesity and overweight has also been linked to abnormalities of the skeletal system.

Orthopedic problems, referred to as skeletal abnormalities in obesity, effect the lower extremities such as the hip, tibia, and the leg (below the knee) (Daniels, 2006). Orthopedic problems are a result of the excess of body weight in obese and overweight children and adolescents which results in problems, such as Blount Disease, a bowing of the tibia and slipped capital femoral epiphsis, disorder of the hip's growth plate (Daniels, 2006). Both Blount Disease and slipped capital femoral epiphysis make it difficult for obese children and adolescents to walk abnormally or make it impossible to walk at all (Daniels, 2006).

Obesity and overweight in children and adolescents has also been linked to various psychosocial issues. Daniels (2006) noted "childhood obesity is also linked with various psychosocial problems, the best studied of which is depression" (p. 56). Since depression has been the most commonly researched psychosocial consequence of obesity, and research results have been contradictive, it seems important to take a closer look at the relationship between depression and childhood and adolescent obesity.

Obesity and depression symptoms. Of the psychological implications of adolescent obesity that have been research, the relationship between adolescent obesity and depression symptoms has been the most prevalent. Daniels (2006) found obese children and adolescents face problems with peers, overweight children tend to have fewer friends and more isolated relationships, resulting in symptoms of depression. Depression has been found to be one of the most common mental health problems in adolescents, and a risk factor associated with the development of depression in adolescents has been weight which can cause body dissatisfaction (Daniels, 2006). Odaci (2007), Goodman and Whitaker (2002), Erermis, Cetin, Tamar,

Bukusoglu, Akdeniz and Goksen (2004), Hasler, Pine, Klienbaum, Gamma, Luckenbaugh, Ajdacic, Eich, Rossler and Angst (2005), Xie, Chou, Spruijt-Metz, Reynolds, Clark, Palmer, Gallaher, Sun, Guo and Johnson (2006) and Daniels (2006) all conducted studies to examine the relationship between obesity and depression (and other various psychological effects of obesity). Although each study consisted of different methods, the participants used were all obese children or adolescents.

In a study with Turkish adolescents, Odaci (2007) investigated "whether obese adolescents differ from normal adolescents with respect to depression, submissive social behaviors and the occurrence of automatic negative thoughts which may be associated with depression" (p. 410). Goodman and Whitaker (2002) conducted a study of school-based youth, ages 7 to 12, to determine whether depression increased the risk for obesity during adolescence. In this study, Goodman and Whitaker (2002), measured obesity by height in feet and weight in pounds, BMI percentiles were calculated and obesity was a BMI greater than the 95th percentile and overweight equal to or greater than the 85th percentile. Goodman and Whitaker (2002) also used a modified version of the Center for Epidemiologic Studies Depression Scale (CES-D) to measure depression symptoms in their subjects. Four covariates were determined for this study, self-esteem, smoking, delinquent behavior and low physical activity (Goodman, & Whitaker, 2002).

Erermis, Cetin, Tamar, Bukusoglu, Akdeniz and Goksen (2004) conducted a study of clinical study group adolescents, non-clinical obese group of adolescents and normal weight adolescents to investigate the type and frequency of psychopathology in obese and non-obese adolescents. In a study done with male and female subjects, using a psychological symptom questionnaire, the Symptom Checklist 90-R, a questionnaire for socio-demographic data, the

relationship between depressive symptoms and increased weight gain and increased obesity in adulthood was researched (Hasler, Pine, Klienbaum, Gamma, Luckenbaugh, Ajdacic, Eich, Rossler, & Angst, 2005).

Lastly, in the research conducted by Xie, Chou, Spruijt-Metz, Reynolds, Clark, Palmer, Gallaher, Sun, Guo and Johnson (2006), a sample of middle school and high school Chinese adolescents were used to examine whether subjects who perceived or misperceived themselves as overweight would experience higher levels of depressive symptoms, perceived stress, hostility and academic performance when compared to participants who were not and did not perceive themselves are overweight. Although the methods used by Odaci (2007), Goodman and Whitaker (2002), Erermis, Cetin, Tamar, Bukusoglu, Akdeniz and Goksen (2004), Hasler, Pine, Klienbaum, Gamma, Luckenbaugh, Ajdacic, Eich, Rossler and Angst (2005), Xie, Chou, Spruijt-Metz, Reynolds, Clark, Palmer, Gallaher, Sun, Guo and Johnson (2006) were not similar, these researchers did find similar results in regards to the relationship between obesity and depression.

The results of the study conducted by Odaci (2007) showed that scores on the Children's Depression Inventory (CDI) were higher than that of the score's of CDI in the normal weight group, suggesting depression was linked to weight. Odaci (2007) reported "our results support previous reports that obese adolescent's depression levels (CDI) are higher than those of normal weight adolescents" (p. 413). Similar to the results of the study conducted by Odaci (2007), Goodman and Whitaker (2002), found 9.0 percent of obese subjects, at baseline, were depressed compared to 9.8 percent of non-obese and 8.2 percent of subjects that were obese at baseline were depressed compared to 8.9 percent of non-obese participants. In addition, Goodman and Whitaker (2002), also found that 12.4 percent of participants that were depressed at baseline were obese at follow-up. Goodman and Whitaker (2002) noted that results of their study

suggested depression causes a worsening of obesity among obese adolescents, therefore, putting already obese adolescents at risk for increased obesity.

Low physical activity and high delinquency were also found to have a significant relationship with depression (Goodman, & Whitaker, 2002). Goodman and Whitaker (2002) found that "depressed mood at baseline was associated with the development of obesity in those not yet obese at baseline" (p. 501), showing that depression could not only be an effect of obesity but could also cause obesity. Further supporting the findings of Odaci (2007), Goodman and Whitaker (2002), results of the study conducted by Erermis et al. (2004), found scores of depression much higher in clinical obese participants. Results of this study found diagnosis of mental disorders and the presence of major depressive disorder were higher in clinical obese adolescents compared to non-clinical obese and normal weight adolescents (Erermis et al., 2004). Erermis et al. (2004) found "the clinical group of obese adolescents had more behavioral and emotional problems than the non-clinical group of obese adolescents and normal weight participants" (p. 300). Scores of depression were also higher for clinical obese adolescents than non-clinical obese adolescents and normal weight participants (Erermis et al., 2004). Non-clinical obese adolescents were also found to have more emotional and behavioral problems (Erermis et al., 2004). Scores for anxiety-depression, CBCL, CDI and the prevalence of depressive disorders and major depression disorders were also higher for participants in the clinical obese group compared to the non-clinical obese group (Erermis et al., 2004). Higher rates of depressive disorder were also found in both the clinical and non-clinical obese groups (Erermis et al., 2004). Based on the results of their study, Erermis et al. (2004), concluded "findings of the present study support the hypotheses that obesity is related to the development of psychopathology in adolescence" (p. 301).

Hasler et al. (2005) also found there was an association between childhood depression and female obesity (Hasler et al., 2005). In addition, Hasler et al. (2005) found "among women, depressive symptoms before age 17 years were associated with both increased weight gain between ages 20 and 40 years, and increased occurrence of adult obesity" (p. 848). Analysis of the results of the study conducted by Hasler et al. (2005) suggested that "binge eating and atypical depression mediated some of the effects of childhood depression on body weight" (p. 848). Hasler et al. (2005) found "depressive symptoms, irrespective of diagnostic status, during childhood may considerably increase the risk for female obesity" (p. 848), which supports previous research that has found similar results. Results of the study, conducted by Hasler et al. (2005), also support previous research in that results have found "increased weight gain associated with childhood depressive symptoms persists from young adulthood to middle age representing a risk for female obesity that increases with age" (p. 848).

Results of the men studied in the research by Hasler et al. (2005) found an "association between body weight and depressive symptoms and adult BMI in both genders being considerably stronger in women and men" (p. 848). Results suggested that depression symptoms effects might appear in the male's growth period, which happens later in men than in women (Hasler et al., 2005). Therefore, the results of the study conducted by Hasler et al. (2005) show a "strong longitudinal association between childhood depressive symptoms and adult BMI increasing with age leading to considerable increase in the incidence of female obesity" (p. 849). Additionally, Xie et al. (2006) found both male and female adolescents who perceived themselves as being overweight were found to report more depressive symptoms when compared to the male and female adolescents who did not perceive themselves as being overweight.

Results of this study support the original hypothesis, finding that weight perception did have a detrimental psychological impact on Chinese adolescents (Xie et al, 2006).

Lastly, Daniels (2006) found that the results of a recent study showed that over half of their sample, of obese adolescents, had a diagnosis involving major depressive disorder and that obese adolescents had more depressive symptoms. Therefore, the results of these studies all support the hypothesis that obesity is related to depressive symptoms in obese adolescents as well the hypothesis that obesity does have a detrimental impact on the psychological well-being of obese adolescents. Although there is a significant amount of research that supports the hypothesis that obesity is related to depression, some research found there is no significant relationship between obesity and depression.

In a quantitative study of high schools students in London; Wardle, Williamson, Johnson, and Edwards (2006) examined whether the strength of obesity-depression association is moderated by gender, ethnicity, and socioeconomic status (SES). Wardle et al. (2006) conducted a five-year longitudinal study of 36 secondary high schools from 13 boroughs in South London. Wardle et al. (2006) used the Senile calibrated solar scales to measure the weight of participants and the Leicester Height measure to determine the height of participants, psychological well-being was assessed using the Strengths and Difficulties Questionnaire (SDQ), the Townsend index based was used to measure socioeconomic deprivation. To determine differences in SDQ-D and ES scores of the three weight status groups Wardle et al. (2006) used an analysis of variance (ANOVA).

The findings of the study conducted by Wardle et al. (2006) found emotional symptoms to be higher in overweight and obese groups compared to normal weight groups, although not significantly higher. Wardle et al. (2006) also found very little association between higher BMI

and emotional well-being. Overall, findings of the study suggested there is little to no correlation between obesity and depression, and there is no significant interaction between genders (Wardle et al., 2006).

Therefore, there is some research that has been conducted that does not support the hypothesis that there is a significant relationship between obesity and depression. Given the relationship between depression and self-esteem, and the relationship between obesity and depression, there is an importance to also examine the relationship between obesity and self-esteem.

The relationship between obesity and self-esteem. In studies aimed at examining the relationship between obesity and self-esteem (and other psychological problems) Wang, Veugelers (2008), Warschburger (2005) and Erermis et al. (2004) conducted research of overweight and/or obese children and adolescents. Wang and Veugelers' (2008) sample included fifth grade students, ages 10 to 11 years old whereas Warschburger (2005) examined the psychological and social effects of obesity in children, considering areas of social discrimination and teasing experiences, emotional problems, school difficulties, functional impairments, and quality of life. In the study conducted by Wang and Veugelers (2008), participants were administered the Harvard's Youth Adolescent Food Frequency Questionnaire (YAQ) and a survey with questions on self-esteem, physical and sedentary activities and to measure heights and weight of participants.

Results of the study conducted by Wang and Veugelers (2008) found body weight significantly affects self-esteem. More importantly, it was found that obese participants reported low self-esteem 1.44 times more than normal weight participants (Wang & Veugelers, 2008). Excess body weight was found to be one of the risks for low self-esteem (Wang & Veugelers,

2008). Similarly, Warschburger (2005) found there was discrimination against obese people, including children, in the areas of education, employment, and health care.

Warschburger (2005) found children aged 3-5 years old are rated as being "chubby", have fewer friends, do not perform as well at school compared to their normal weight peers, and are less liked by their parents. Warschburger (2005) found that physical attributes, such as weight, made for common targets for teasing among children and adolescents and obese children were teased three times more than their normal weight peers. Warschburger (2005) found psychological problems associated with obesity included negative self-esteem. Warschburger (2005) also found obese children tended to score lower on physical and general self-esteem scales compared to their normal weight peers.

Lastly, in an examination of the quality of life for obese children and adolescents, Warschburger (2005) found obese children and adolescents experienced restrictions in the area of self-esteem. The results of the studies conducted by Wang and Veugelers (2008), and Warschburger (2005) supported their hypothesis, as findings showed participants that were obese reported lower self-esteem when compared to non-obese participants. In a study conducted by Erermis et al. (2004), self-esteem was found to be lower for the clinical obese group when compared to normal weight participants and scores on the Children's Depression Inventory (CDI) were also higher for both clinical and non-clinical obese participants when compared to normal weight participants. Obese male adolescents were also found to have lower self-esteem levels than obese female adolescents whereas scores of aggressiveness and externalizing behavior were higher for obese females compared to obese male participants (Erermis et. al., 2004). The results of this study also found there to be a significant difference in the level of self-esteem for clinical obese adolescents and normal weight adolescents (Erermis et al., 2004).

Erermis et al. (2004) found that obese adolescents "showed significantly lowered self-esteem" (p. 300). Therefore, the results of these studies support the idea that obese adolescents suffer from lower self-esteem when compared to normal-weight or non-obese peers. Although the results of the studies conducted by Wang and Vuegelers (2008), Warschburger (2005) and Erermis et al. (2004) did support the hypothesis that obese adolescents do suffer from lower self-esteem compared to normal weight peers, there is some research that does not support this hypothesis.

In a study similar to that of Wang and Veugelers (2008) and Warschburger (2005); Israel and Ivanova (2002) conducted a quantitative research study of 121 overweight children ages 8-14 years, all of which had presented for weight reduction treatment at a university-based clinic, to examine age and gender difference in global and dimensional self-esteem in overweight children. Using different methods than Wang and Veugelers (2008) and Warschburger (2005), Israel and Ivanova (2002) used the Perceived Competence Scale for Children (PCSC) to measure the general and dimensional self-esteem in children and adolescents.

Contrasting the findings of Wang and Veugelers (2008) and Warschburger (2005), Israel and Ivanova (2002) found that averages for the general and dimensional self-esteem of participants in their study were not significant compared to the averages for the children of the same age in the community. Israel and Ivanova (2002) conducted a multiple regression for each self-esteem score and found a significant level of impact for gender on general self-esteem, females generally had lower levels of self-esteem with a p-value greater than .05. Israel and Ivanova (2002) also found age had an impact on physical self-esteem: the older a participant the lower his/her level of physical self-esteem, with a p-value of .05. Israel and Ivanova (2002) found younger participants to report lower physical self-esteem compared to pre-adolescents,

overweight females reported lower physical self-esteem than lower weight females, and males in the overweight group reported higher physical self-esteem scores than those in lower weight groups.

Unlike the findings of Wang and Veugelers (2008) and Warschburger (2005), Israel and Ivanova (2002) did not find there to be a significant relationship between physical self-esteem and general self-esteem in the multiple regression, suggesting that there is not a relationship between obesity and self-esteem. In addition to obesity being found to be linked to serious physical health problems, depression symptoms and low self-esteem, obesity has also been found to be associated with suicidal thoughts, behavior and actions.

Incidence of suicide among obese adolescents. Whetstone, Morrisey and Cummings (2007) conducted a quantitative study of 27 middle schools in four eastern North Carolina counties. Whetstone et al. (2007) examined the relationship between perceived weight status and suicidal thoughts and actions by gender in middle school youth. Whetstone et al. (2007) used the YRBS to assess and monitor health risk behaviors in youth. Using three outcome variables (self-reported thinking, planning, and attempting suicide) Whetstone et al. (2007) conducted a Chi-square analysis to determine the bivariate relationships between suicidal thoughts and actions, and personal and family characteristics. Whetstone et al. (2007) conducted a multiple logistic regression to examine the relationship between weight status and thinking, planning, and trying suicide. Whetstone et al. (2007) also conducted three separate regressions for thinking, planning, and trying suicide. Whetstone et al. (2007) had several significant findings related to perceived weight status, actual weight status and suicidal thinking, planning and suicidal acts.

Whetstone et al. (2007) found a large percent of students who perceived themselves as overweight had thought, planned, or tried suicide more compared to those who perceived

themselves to be normal or underweight, with a significance level at or greater than 0.001. Whetstone et al. (2007) found, with regards to associations between suicidal thoughts and actions, perceived weight status, and family and personal characteristics, a significant association for males and females who perceived themselves as overweight for all three dependent variables. Whetstone et al. (2007) also found males that were underweight were more likely to think, plan, or attempt suicide. Whetstone et al. (2007) found, of those students who perceived themselves as overweight, had planned or tried suicide more compared to their peers who perceived themselves as normal weight or underweight. Female participants were found to have reported thinking, planning or trying suicide significantly more than male participants (Whetstone et al., 2007). Whetstone et al. (2007) found a "significant difference in the percentage of male and female students reporting suicidal thoughts and actions and of being overweight" (p. 63). Whetstone et al. (2007) also found "perceiving oneself to be overweight was significantly related to suicidal thoughts and actions for both boys and girls" (p. 63).

Whetstone et al. (2007) noted the "findings from our study document the important relationship between weight perception and suicidal thinking and behavior" (p. 64). Whetstone et al. (2007) suggest the findings of their study are "significant in the context of the present epidemic of obesity among children in the United States" (p. 64). These researchers pointed to the continuous presentation of slender females and muscular males and the ideal body image by television and publications, which could result in overweight children experiencing a mismatch in body weight and perception (Whetstone et al., 2007). Whetstone et al. (2007) suggested "this mismatch might contribute to increasing suicidal thoughts" (p. 64). In researching previous literature and studies that have been done in this area, Whetstone et al. (2007), also noted "weight perception may be affecting suicidal thoughts and behaviors through increased levels of

depression" (p. 64) suggesting that a relationship between weight perception and depression might exist.

The results of the study conducted by Whetstone et al. (2007) support the hypothesis that the perception of overweight is significantly associated with suicidal thoughts or actions. Results of this study also suggested that adolescents, especially in adolescent females, that are overweight and perceive themselves as being overweight are at an increased risk for thinking, planning or trying suicide compared to their peers who are normal weight and whom perceive themselves as normal weight. Symptoms of depression, low self-esteem and an increased risk of suicidal thinking, planning and action have been found, by some researchers, to be related to adolescent obesity. Similarly, research has found a positive association between adolescent obesity and weight based teasing or peer victimization.

Peer victimization among obese adolescents. It is hypothesized that obese adolescents experience increased victimization by their peers as a result of their weight status. As noted by Adams and Bukowski (2008) "victimization was thought to lead to more negative views about physical appearance and this would, in turn, lead to depression and changes in body mass" (p. 858). Adams and Bukowski (2008) also noted that "obese adolescents have been found to experience high rates of peer victimization" (p. 858). Adams and Bukowski (2008) suggested the importance of taking a closer look at the relationship between obesity and victimization. Adams and Bukowski (2008) examined the peer victimization pathway as a process for examining the pathway from victimization to changes in body mass.

Participants for this study were from the National Longitudinal Survey for Children and Youth, a sample of Canadian children ages 0-14 (Adams, & Bukowski, 2008). A weighted sample of 442,776 children and youth were used and victimization was assessed by asking

participants to choose the answer to the question “children say nasty things to me at school, I am bullied at school, and I am bullied on my way to and from school” on a scale of 1-5, self-concept for physical appearance was measured by asking participants to rate their answer to the question “I like the way I look” on a scale of 1-5 and depressive symptoms were measured using the CES-D scale.

Results of this study found that the pathway between peer victimization and changes in body mass was stronger for obese adolescents, in which peer victimization predicted changes in depression and body mass (Adams, & Bukowski, 2008). Findings of this study also support previous research in that results found peer victimization to predict later depressive symptoms in obese adolescents, the effects of victimization seeming to be most important for those who were at risk for being victimized, obese adolescents (Adams, & Bukowski, 2008). How female participants felt about themselves resulted in half of the effect of victimization on changes in depression and body mass index (Adams, & Bukowski, 2008). Adams and Bukowski (2008) found “victimization seems to reinforce the negative feeling about how they looked and this in turn predicted increases in depression and body mass” (p. 864). For male participants Adams and Bukowski (2008) found depressive symptoms to be related to ”peer victimization decreasing an adolescent’s perception of their physical appearance which may be more likely to lead to externalizing behaviors, such as aggression in obese males, which in turn cause depressive symptoms” (p. 864).

Therefore, results of this study also support previous research, finding that obese adolescents are at increased risk for victimization because of their weight status. In addition to the hypothesis that obesity is significantly related to physical health complications, depression,

low self-esteem, the incidence of suicide and peer victimization there is also thought that obesity is related to various psychosocial outcomes in obese adolescents.

Psychosocial outcomes of obesity. Problems with quality of life and various psychosocial problems have been found in overweight and obese children and adolescents. Daniels (2006) noted "health-related quality of life for obese children and adolescents was similar to that of children diagnosed with cancer" (p. 57). Fulkner, Strauss, Neumark-Sztainer, Story and Boutelle (2007), Flodmark (2005), Merten, Wickrama and Williams (2008), and Van Vlierberghe and Braet (2007) all conducted research to investigate the relationship of obesity with various psychosocial outcomes in adolescents.

Fulkner, Strauss, Neumark-Sztainer, Story and Boutelle (2007) researched the psychosocial well-being of obese adolescents and the role of the family in the psychosocial well-being of overweight adolescents. Flodmark (2005) conducted a qualitative review to examine whether the negative psychological effects of obesity are also present in the whole population of obese and overweight children and what tools could be recommended to measure the psychological effects of obesity. In a study conducted to examine whether Young's schema theory can be use to understand psychopathology in youth, Van Vlierberghe and Braet (2007) researched psychopathology in obese adolescents compared to normal weight adolescents. Merten, Wickrama and Williams (2008) conducted a study in which they researched whether obesity during adolescence would confound the association between weight status and psychosocial well-being in young adulthood. Faulkner, Strauss, Neumark-Sztainer, Story and Boutelle (2007), Flodmark (2005), Merten, Wickrama and Williams (2008), and Van Vlierberghe and Braet (2007) all conducted research to examine the relationship between obesity and various psychosocial outcomes. Although these researchers conducted research to

examine the relationship between obesity and various psychosocial problems, the methods used to conduct their research were different.

To examine whether obesity in adolescence had a unique detrimental influence on specific psychosocial domains of men and women, Merten et al. (2008) conducted a study of African American and White adolescents from waves 1 and 3 of the National Longitudinal Study of Adolescent Health, which examined the psychosocial consequences that obese adolescents encounter. Merten et al. (2008) also examined whether obesity in adolescence was related to poorer mental health and lower status attainment in educational attainment and endeavors, job status and job satisfaction.

In their study of psychopathology, Vlierberghe and Braet (2007) used a sample of obese adolescents that had been admitted for obesity treatment and normal weight adolescents from two secondary schools. To measure psychopathology, Vlierberghe and Braet (2007) gave participants the Young Schema Questionnaire (YSQ), Child Behavior Checklist (CBCL) and the Youth Self Report (YSR). After data was collected and analyzed, Vlierberghe and Braet (2007) conducted a comparison study to compare measures on each scale between obese adolescent participants and non-obese adolescent participants.

In the research conducted by Faulkner et al. (2007), it was hypothesized and subsequently researched that "the psychosocial well-being of overweight youths would be most directly associated with familial commentary about weight and family mealtime environment" (p. 181). Links between familial commentary about weight and family mealtime environment were examined using four psychosocial variables: depressive symptoms, self-esteem, body dissatisfaction and unhealthy weight behaviors (Faulkner et al, 2007). In addition to measuring psychosocial variables, data was drawn from Project EAT (Eating Among Teens) which

included 4,746 7^{th}-12^{th} grade students from 31 different schools across the Midwest (Faulkner et al., 2007).

Faulkner et al. (2007) measured for family connectedness by asking how much participants cared for and how much they feel they can talk to their mother/father about their problems. Family commentary about weight was assessed by asking "have you ever been teased or made fun of by family members because of your weight?", and two questions about parental encouragement to diet. Depressed mood was measured by asking participants how much they had been bothered by six common symptoms of depression during the past 12-months. Self-esteem was assessed using six items from the Rosenberg Self-Esteem Scale. Body dissatisfaction was assessed using the Body Shape Satisfaction Scale and the Unhealthy Weight-Control Behaviors Scale was used to assess unhealthy eating behaviors (2007). In addition to different methods being used to conduct research to examine whether a relationship exists between obesity and various psychosocial outcomes, Faulkner, Strauss, Neumark-Sztainer, Story and Boutelle (2007), Flodmark (2005), Merten, Wickrama and Williams (2008), Van Vlierberghe and Braet (2007) also found contrasting results.

Results of each studied varied, some researchers found that the psychosocial outcome that was researched did have a significant relationship to obesity and some researchers did not find a significant relationship between the psychosocial outcome that was researched and obesity. For example, in the study conducted by Merten et al. (2008), it was that found normal weight women had a higher mean level of status attainment compared to women who were obese during adolescence. It was also found that those that were normal weight in adolescence yielded a higher level of status attainment in young adulthood (Merten et al., 2008).

For depressive symptoms it was found that obesity during adolescence did not significantly predict an increase in depressive symptoms among male participants (Merten et al., 2008). However, for female participants, being obese in adolescence significantly predicted depressive symptoms, when compared to participants that were normal weight during adolescence (Merten et al., 2008). Obesity in adolescence was found to be associated with significantly lower status attainment in young adulthood as well participants that had current or prior depressive symptoms were associated with lower status attainment (Merten et al., 2008). Obesity in adolescence was also significantly related to more depressive symptoms in young adulthood (Merten et al., 2008).

Among females participants a significant interaction was found between status attainment and obesity, results found young adult status attainment to be lower among obese female participants (Merten et al., 2008). In regards to depressive symptoms, it was also found that depressive symptoms tended to increase among obese female participants, and in general it was found that obesity in adolescence significantly increased the number of depressive symptoms in young adulthood (Merten et al., 2008). Merten et al. (2008) also found "individuals who are obese in both adolescence and young adulthood have significantly lower status attainment" (p. 1118). It was found that participants that were obese in both adolescence and young adulthood had significantly more depressive symptoms compared to their normal weight peers (Merten et al., 2008).

Merten et al. (2008) noted the main finding of their study was "obesity during adolescence negatively affects psychosocial well being in young adulthood" (p. 1118). Merten et al. (2008) were also able to find lower levels of educational and career attainment and higher levels of depressive symptoms among participants that were obese during adolescence. Given

these findings Merten et al. (2008) suggested "obesity during adolescence puts individuals at risk for a life-long struggle with poor mental health" (p. 1118).

In teenage female participants, Merten et al. (2008), found obesity status to be significantly associated with lower levels of status attainment and higher levels of depressive symptoms in young adulthood compared to their normal weight peers. For male participants, results of this study did not find depression and status attainment in young adulthood were related to obesity in adolescence (Merten et al., 2008). Given the results of their study, Merten et al. (2008), suggested that "depression in adolescence is significant for both male and female young adults which demonstrates the stability of depression over time and highlights the importance of attenuating risk factors for depression early in the lifespan-especially for obese women" (p. 1119).

Therefore, the results of the study conducted by Merten et al. (2008) supported the initial hypothesis; obesity does have a detrimental effect on some psychosocial aspects for men and women. Results of the study also support that in the psychosocial area of depressive symptoms and status attainment, female participants who were obese in adolescence were found to experience lower status attainment and higher levels of depression/depressive symptoms then normal weight participants. Therefore, the results of the study conducted by Merten et al. (2008) supported the relationship between obesity and various psychosocial outcomes.

Similarly, in the study conducted by Vlierberghe and Braet (2007) internalizing and externalizing symptoms were reported by about 50% of the parents of obese participants. In addition, clinically significant internalizing problems were reported by forty-six percent of the participants and significant externalizing symptoms were reported by 27% of participants (Vlierberghe, & Braet, 2007). Obese participants were found to have scored significantly higher

for both self and parent reported psychological symptoms (Vlierberghe, & Braet, 2007). Obese adolescents were also found to have had higher levels of dysfunctional schemas on the YSR compared to normal weight participants (Vlierberghe, & Braet, 2007). Vlierberghe and Braet (2007) found an association between schemas and psychopathology as obese adolescents exhibited a stronger belief in self-statements related the YSR schemas "Emotional Deprivation, Social Isolation/Alienation, Defectiveness/Shame, Failure to Achieve, Dependence/Incompetence and Subjugation" (p. 348). Vlierberghe and Braet (2007) attributed the internalizing problems reported by the obese adolescents to be related to the Social Isolation/Alienation and Vulnerability to Harm/Illness schemas and externalizing symptoms reported by the obese adolescents to be related to the Entitlement and Dependence/Incompetence schemas. Results of the study conducted by Vlierberghe and Braet (2007)supported the results of the study conducted by Merten et al. (2008) as well as the hypothesis that obesity in adolescence impacts various psychosocial outcomes.

The findings of the research conducted by Faulkner et al. (2007) did support the research conducted by Vlierberghe and Braet (2007), and Merten et al (2008), as they found that psychological well-being, decreased depressive symptoms and unhealthy weight-control behaviors were positively associated with making family meals a priority and having a positive mealtime environment, results which supported their original hypothesis. Indicators of poor psychological health were found to be associated with teasing about weight by family members and parental encouragement to diet, familial teasing was found to be significantly related to poor psychological outcomes in both overweight male and female participants (Faulkner et al., 2007).

Whereas psychological well-being among overweight adolescents was found to be related to making family meals a priority, keeping the atmosphere at meals positive, refraining from

weight teasing and refraining from direct encouragement to diet (Faulkner et al., 2007). Faulkner et al. (2007) also found less depressed mood among overweight adolescents to be associated with making family meals a priority. A relationship between self-esteem and the atmosphere of mealtime was also found by Faulkner et al. (2007), finding that self-esteem in overweight adolescents may be enhanced by a home base marked by affirming mealtime conversation.

Faulkner et al (2007) noted "our findings with overweight teens are consistent with previous research showing the harmful effects of weight-based teasing on psychosocial well-being among adolescents" (p. 184). Therefore, supporting research that has found weight based teasing to have adverse outcomes on the psychological well-being of overweight and obese adolescents, especially in regards to depressive symptoms and self-esteem. However, unlike Merten et al. (2008), Vlierberghe and Braet (2007) and Faulkner et al. (2007), the results of research conducted by Flodmark (2005) did not support the hypothesis that obesity in adolescents was related to all areas of psychosocial outcomes researched by Vlierberghe and Braet (2007), Merten et al. (2008) and Faulkner et al. (2007).

Similar to Vlierberghe and Braet (2007) and Merten et al. (2008), Flodmark (2005) found, in a study of 313 females ages 9.1-10.8 years using the Self-Perception Profile for children and its five subscales (scholastic competence, social acceptance, athletic competence, physical appearance, and behavioral conduct), significant differences between overweight/obese children and normal weight children in the subscales of physical appearance and athletic competence. Flodmark (2005) also found the general weight category was significant overall on self-competence, and overweight/obese children found less importance in social acceptance and athletic competence compared to normal weight children.

However, unlike the findings of Vlierberghe and Braet (2007) and Merten et al. (2008), Flodmark (2005) did not find differences between weight groups with regards to peer nominations of popularity and peer perception of attractiveness for obese/overweight children. Flodmark (2005) did find obese/overweight children between the ages of nine and ten years to have better self-esteem than previous research showed. Flodmark (2005) suggests using different tools, such as child self-reported PedsQL scores, ITIA self-esteem, Self-Perception for Children, and German version of KINDL, to test for quality of life in overweight/obese children and to test for general quality of life in children. The findings of the study conducted by Flodmark supported the hypothesis that there is a relationship between obesity and some psychosocial outcomes in adolescents. However, the findings of the study conducted by Flodmark (2005) do not fully support the findings of Vlierberghe and Braet (2007) and Merten et al. (2008), as Flodmark (2005) did not find a significant relationship between obesity and all of the psychosocial outcomes that were studied.

Summary

The results of this literature review on adolescent obesity are mixed. Are obese adolescents at risk for short-term and long-term physical health problems? Research has shown and researchers agree that adolescent obesity is a clear and present danger for the adolescents of today. Researchers agree that overweight/obese adolescents are at immediate risk for severe short and long term physical health problems due to obesity. There is an immediate importance for research to continue in the area of adolescent obesity as an epidemic to create a societal understanding of the increasing prevalence of adolescent obesity.

The results of this literature review also show that there is a need for further research in examining the association of adolescent obesity with self-esteem, psychological health and

psychosocial outcomes. Are obese adolescents at risk for increased depression, decreased self-esteem, increased peer victimization and detrimental effects to various psychosocial outcomes? Research in this area is somewhat inconclusive. Some research has shown obese adolescents suffer psychological and psychosocial implications due to obesity, and some research show the opposite results. More research needs to be done on the psychological and psychosocial effects, if any, for overweight/obese adolescents so that possible impacts of obesity on the psychological and emotional development of adolescents can be better understood.

Some of the reviewed literature point toward a positive relationship between adolescent obesity and adolescent's self-esteem and psychological health. On the other hand, some of the research that has been reviewed shows that there is no relationship between adolescent obesity and self-esteem and psychological health. Adolescents that are obese may not necessarily have lower self-esteem and more psychological health and psychosocial problems compared to their normal weight peers. It is important for further research to be conducted to further examine whether or not an association exists between obese adolescents and psychological/psychosocial problems compared to normal/average weight adolescents to create a better understanding of the psychological impacts, if any, obesity has on a today's adolescents. In an effort to further research the relationship between adolescent obesity and depression and self-esteem, this researcher conducted a research project. The methods, setting, participants, procedures, instruments that were used for this research project, as well as, the results of the research project are discussed.

Method

A survey was conducted of high school adolescents, ages 14-17, enrolled in health class. Participants were asked to report their age, sex, weight and height. Depression and self-esteem

were measured using The Rosenberg Depression Scale and The Center for Epidemiological Studies Depression Scale for Children (CES-DC). Body Mass Index was measured using the weight (in kilograms) divided by height (in meters) squared formula. The initial intent of this research project was to conduct a comparison study to assess whether symptoms of depression and low self-esteem symptoms would be more prevalent among overweight/obese participants compared to normal weight participants. However, due to low participation, a comparison study was not conducted and instead the results collected were analyzed and assessed using the few participants that were given consent by their parent/guardian, gave their own consent and participated in this research project.

Setting

This research project took place at a suburban high school, grades 9-12, which included students from two towns/villages in the north east United Sates. According to this school's database, in the 2009-2010 school year, the population of this high school was approximately 702 students. Students of American Indian or Alaskan Native ethnicity were 0% of the student population. Asian or Pacific Islander students were 1% of the student population and 2% of students were Black (not Hispanic). Students of Hispanic ethnicity consisted of 1% and 96% of students were White, not Hispanic. No students were identified as Multiracial (0%). Twenty percent of the student population came from economically disadvantaged families, qualifying these students for the assistance with lunch program. Fifteen percent of students were eligible for free lunch and five percent of students were eligible for reduced-price lunch. The average income for a family in the researched suburban communities was approximately $52,933 and the per capita income for a family in the researched suburban communities was approximately $24,129. The average size of the researched suburban communities was 17,963 people. The

average income for a family and the average size of the suburban communities indicated that there was a mix among the average family in the researched communities. Some families struggled with financial difficulties, relied on financial aid from the state (such as free-reduced lunch program or food stamps) and lived in low income housing (i.e. trailer parks or section 8 housing) and some families were considered as middle class and needed little to no financial assistance. Therefore, some students in the researched communities needed assistance with purchasing school supplies, clothing and fee waivers for national scholastic tests/exams (i.e. scholastic aptitude test and/or advanced placement exams), whereas other students, i.e. students who came from middle class families, did not need financial assistance with school supplies, clothing and fee waivers.

Participants

This research project used participants from quarter one and quarter two high school health classes. Male and female students in grades 10-12 and who were between the ages of 15-17 (The Center for Epidemiological Studies Depression Scale for Children (CES-DC) is not designed for children older than 17 years of age) were eligible for participation in this research project. Participants must have given their own consent (see Appendix A) for participation and must also have been given consent (see Appendix B) by their parent(s)/guardian(s)to participate in this research project.

Procedure

Since this research project was designed to study the association, if any, between the prevalence of depression symptoms and low self-esteem among obese participants compared to normal weight participants, a survey (see Appendix C) was developed using The Rosenberg Self-Esteem Scale (SES) and an adapted version of The Center for Epidemiological Studies

Depression Scale for Children (CES-DC). Both The Rosenberg Self-Esteem Scale and The Center for Epidemiological Studies Depression Scale for Children were not copyrighted and required no fee for their use. The survey was given to high school students, in grades 10-12, male and female, enrolled in health class. Consent forms for parents and students were sent out within one week of approval, parent(s)/guardian(s) and students were asked to return the consent forms within three to four days of their postmarked date. The survey was presented to students within one week of the date that parents and students were asked to return consent forms. The participants of this project were asked to complete an anonymous survey which was given during their high school health class. The survey included demographic questions developed by the researcher, necessary for the conduction of their research, as well as The Rosenberg Self-Esteem Scale and an adapted version of The Center for Epidemiological Studies Depression Scale for Children (CES-DC). After completing the survey, participants returned the survey, the returned surveys were put into an envelope, and then to the surveys were returned to the researcher in a sealed envelope via their mailbox at the High School. The researcher was not knowledgeable of the names and/or faces of the participants. After data was collected the researcher analyzed the data, calculating BMI for each participant, and using the Centers for Disease Control and Prevention Body Mass to Index-for-age percentiles growth chart to determine whether participants were obese, overweight, normal weight or underweight. Depression and self-esteem were then determined using the scoring tools for The Rosenberg Self-Esteem Scale (SES) and an adapted version of the Center for Epidemiological Studies Depression Scale for Children (CES-DC). Using each participants scores form the SES and SEC-DC, a comparison study was conducted to determine whether depression and low self-esteem symptoms would be greater among obese participants compared to normal weight participants.

Instruments

The Rosenberg Self-Esteem Scale (SES), a ten item Guttman or Likert scale, was used to measure self-esteem of participants. The Rosenberg Self-Esteem scale is both reliable and valid for a questionnaire for assessing self-esteem (Rosenberg, 1965). DeBate, Gabriel, Zwald, Huberty and Zhang (2009) used The Rosenberg Self-Esteem scale in a research project to study the changes in psychosocial factors and physical activity frequency among young females and found the scale to be reliable, with a Cronbach alpha of 0.79 for both pre-tests and post-tests (p. 477). Rosenberg, the creator of the Self-Esteem scale, considered four theoretical and practical items when creating the scale, ease of administration or "our instrument simply required the respondent to check his answers to ten items" (p. 16, 1965), economy of time or "in order to obtain the cooperation of school authorities, it was necessary to use anonymous questionnaires which could be filled out within a single class period" (p. 16), unidimensionality or "the adequacy of each item is not determined primarily by its relationship to a total scale but by its patterned relationship with all other items on the scale" (p. 16-17) and face validity in which items were selected "which openly and directly dealt with the dimension under consideration" (p. 17). The ten item survey utilized in this research project, asked participants to respond "strongly agree, agree, disagree or strongly disagree" to positive and negative statements which were presented, atlternatively, throughout the scale (Rosenberg, 1965). The self-esteem scale, created by Rosenberg (1965), presented participants with the following items: "I feel that I'm a person of worth, at least on an equal plan with others", "I feel I have a number of good qualities", "All in all, I am inclined to feel that I am a failure", "I am able to do things as well as most other people", "I feel I do not have much to be proud of", "I take positive attitude toward myself", "On the whole, I am satisfied with myself", "I wish I could have more respect for myself", "I

certainly feel useless at times" and "At times I think I am no good at all" (p. 305-308). Items on the scale were scored, "positive responses indicated low self-esteem" (Rossenberg, 1965). Participants were given a score of three if they answered strongly agree, two if they answered agree, one if they answered disagree or zero if they answer strongly disagree for item numbers one, two, four, six and seven on the ten item scale. Subsequently, if participants answered strongly agree they were given a zero, agree they were given a one, disagree a two, strongly disagree a three for items numbered three, five, eight, nine and ten on the ten item, Likert scale. After completing the self-esteem scale, participant's scores were added together, and on a range of zero to thirty, participants who scored between fifteen and twenty-five were suggested to have normal self-esteem and scores below a fifteen suggested low self-esteem.

The Center for Epidemiological Studies Depression Scale for Children (CES-DC), an adapted version of The CES-D: A self-report scale for research in the general population. Radloff (1977), the original creator of the CES-D, designed the scale "to measure depressive symptomatology in the general population" (p. 385). The scale consists of symptoms associated with depression as the scale items and was found to be high in internal consistency and to have adequate test-restest repeatability (Radloff, 1977). Radloff (1977) also found the scale to have high validity and reliability, "established by patterns of correlations with other self-report measures, by correlations with clinical ratings of depression and by relationships with other variables" (p. 385). The CES-DC is a twenty item scale in which participants are asked, during the past week, "I was bothered by things that usually don't bother me", "I did not feel like eating, I wasn't very hungry", "I wasn't able to feel happy, even when my family or friends tried to help me feel better", "I felt like I was just as good as other kids", "I felt like I couldn't pay attention to what I was doing", "I felt down and unhappy", "I felt like I was too tired to do things", "I felt

like something good was going to happen", "I felt like things I did before didn't work out right", " I felt scared", "I didn't sleep as well as I usually sleep", "I was happy", "I was more quite than usual", "I felt lonely, like I didn't have any friends", "I felt like kids I know were not friendly or that they didn't want to be with me", "I had a good time", I felt like crying", "I felt sad", "I felt people didn't like me", "It was hard for to get started doing things". Participants were asked to respond not at all, a little, some or a lot to items and were given a score ranging from zero to three, depending on the item number and their response. For items numbered four, eight, twelve and sixteen participants were given a three if they answered not at all, a two if they answered a little, a one if they answered some and a zero if they answered a lot. Scores on the CES-DC scale range from zero to sixty and a cut off score of fifteen is found to be indicative of depressive symptoms in children and adolescents (Weissman et al., 1980).

Results

Of the ninety students drawn for participation in this research project, only five met all criteria for participation (see Figure 1). Of the five participants that met participation criteria, eighty percent fell within normal Body Mass Index (BMI) range for age percentiles and twenty percent of participants fell below BMI range for age (see Figure 2). No participants fell above BMI range for age percentiles, none were found to be overweight or obese. The four participants that had BMI within normal range for age, had BMI of 18.54, 20.18, 21.62 and 22.49 (see Figure 3). One participant was found to have a BMI that fell below normal range for age, had a BMI of 16.95 (see Figure 3).

All participants scored within normal range on The Rosenberg Self-Esteem Scale (SES), scoring between 16 and 22 (see Figure 4). When given the statement "On the whole, I am satisfied with myself" sixty percent of participants responded that they agreed and forty percent

responded that they strongly agreed. When asked to respond to the statement "At times, I think I am no good at all" sixty percent agreed, twenty percent disagreed and twenty percent strongly disagreed. Sixty percent of participants responded that they agreed when asked to respond to the statement "I feel that I have a number of good qualities" and forty percent strongly agreed. When given the statement "I am able to do things as well as most other people" eighty percent of participants strongly agreed and twenty percent agreed. Sixty percent of participants disagreed when asked to respond to the statement "I feel I do not have much to be proud of" and forty percent strongly disagreed. Sixty percent of participants agreed and forty percent of participants disagreed in response to the statement "I certainly feel useless at times". Sixty percent of participants agreed when asked to respond to the statement "I feel that I'm a percent of worth, at least on an equal plane with others" and forty percent strongly agreed. Twenty percent strongly agreed, forty percent agreed and forty percent strongly disagreed when asked to respond to the statement "I wish I could have more respect for myself". Sixty percent of participants strongly disagreed when asked to respond to the statement "All in all, I am inclined to feel that I am a failure" and forty percent disagreed. Forty percent strongly agreed, forty percent agreed and twenty percent disagreed when asked to respond to the statement "I take a positive attitude toward myself".

On the Center for Epidemiological Studies Depression Scale for Children (CES-DC) eighty percent of participants fell within normal range and twenty percent of participants scored high enough to suggest depression (see Figure 5). Participants were asked to respond to various statements by circling how much they felt a certain way during the past week. When given the statement "I was bothered by things that usually don't bother me" forty percent of participants responded not at all, forty percent responded a little and twenty percent responded some. Forty

percent of participants responded not at all when asked to respond to the statement “I did not feel like eating, I wasn’t very hungry” and twenty percent of participants responded some. When asked to respond to the statement “I wasn’t able to feel happy, even when my family or friends tried to help me feel better” all participants responded not at all. Eighty percent of participants responded a lot when asked to respond to the statement “I felt like I was just as good as other kids” and twenty percent responded some. When given the statement “I felt like I couldn’t pay attention to what I was doing” sixty percent responded not at all, twenty percent responded a little and twenty percent responded some. When asked to respond to the statement “I felt down and unhappy” forty responded not at all, twenty responded a little and forty responded some. Eighty percent of participants responded not at all when asked to respond to the statement “I felt like I was too tired to do things” and twenty percent of participants responded some. When given the statement “I felt like something good was going to happen” sixty percent responded a lot, twenty percent responded some and twenty percent responded a little. Sixty percent of participants responded some when asked to respond to the statement “I felt like things I did before didn’t work out right” twenty percent responded a little and twenty percent responded not at all. When asked to respond to the statement “I felt scared” sixty percent of participants responded not at all and forty percent responded a little. Sixty percent of participants responded not at all when given the statement “I didn’t sleep as well as I usually sleep” twenty percent responded some and twenty percent responded a little. When asked to respond to the statement “I was happy” one hundred percent of participants responded a lot. Eighty percent of participants responded not at all when given the statement “I was more quiet than usual” and twenty percent responded a little. All participants responded not at all when asked to respond to the statement “I felt lonely, like I didn’t have any friends” and “I felt like kids I know were not

friendly or that they didn't want to be with me". When given the statement "I had a good time", eighty percent of participants responded a lot and twenty percent responded some. Sixty percent of participants responded not at all when asked to respond to the statement "I felt like crying" twenty percent responded a little and twenty percent responded some. When given the statement "I felt sad" sixty percent responded not at all, twenty percent responded a little and twenty percent responded some. All participants responded not at all when asked to respond to the statement "I felt people didn't like me". Eighty percent responded not at all and twenty percent responded a little when given the statement "It was hard to get started going things".

Discussion

Interpretation of the findings

Unfortunately, because of the small number of participants that were included in this research study, none of them were found to be obese or overweight. Therefore, the results of this research project did not support the work of Inge, Krebs, Garcia, Skelton, Guice, Strauss, Albanese, Brandt, Hammer, Harmon, Kane, Klish, Oldham, Rudolph, Helmrath, Donovan and Daniels (2004) that suggested the seriousness of obesity as a national epidemic. The results of this research project also do not support the literature, indicating that obese and overweight adolescents suffer from increased psychological implications (i.e. increased depression, decreased self-esteem) as a direct result of their obesity, such as was found by Inge et. al (2004), that the nation's children and adolescents are at greater risk for physical and psychological problems as a result of being overweight or obese. Additionally, the results of this research project were unable to support the findings of Reilly (2007), Adams and Bukowski (2008), Bassett and Perl (2004), and Davis and Carpenter (2009) who all found that obese adolescents suffer from significant psychological implications. The results of this research project also did

not support the reviewed literature, with regards to the relationship between obesity and depression.

This research project intended to investigate whether a relationship exists between obesity and depression. More specifically, would obese participants suffer from higher scores on the CES-D scale (suffer from more symptoms of depression) when compared to normal weight participants. However, due to, the lack of obese and/or overweight participants in this research project, the results of did not support the findings of Daniels (2006), that obese children and adolescents face problems with peers, overweight children tend to have fewer friends and more isolated relationships, resulting in symptoms of depression. Nor did the results of the research project support the research of Odaci (2007), Goodman and Whitaker (2002), Erermis, Cetin, Tamar, Bukusoglu, Akdeniz and Goksen (2004), Hasler, Pine, Klienbaum, Gamma, Luckenbaugh, Ajdacic, Eich, Rossler and Angst (2005), Xie, Chou, Spruijt-Metz, Reynolds, Clark, Palmer, Gallaher, Sun, Guo and Johnson (2006) who all found a significant relationship between those that suffered from obesity and increased symptoms of depression. Lastly, the results of this research project did not support the research of Daniels (2006) whom found depression to be one of the most common mental health problems in adolescents, and a risk factor associated with the development of depression in adolescents has been weight which can cause body dissatisfaction (Daniels, 2006). Additionally, due to the low number of participants and the lack of any obese participants, the results of this research project were unable to support previous research that found a significant relationship between obesity and decreased self-esteem.

Similar to the intent of this research project to investigate the relationship between obesity and depression, this research project also intended to investigate the relationship between

obesity and self-esteem. This research projected intended to investigate whether obese participants would score higher on the SES scale (have decreased self-esteem) when compared to normal weight participants. Due to their being no obese participants in this research project the results of the research project did not support the previous research, such as the results of the study conducted by Wang and Veugelers (2008) whom found body weight significantly affected self-esteem. The results of this research project also did not support the work of Warschburger (2005) who found psychological problems associated with obesity included negative self-esteem or who also found obese children tended to score lower on physical and general self-esteem scales compared to their normal weight peers. Results also did not support Warschburger's (2005) findings that obese children and adolescents experienced restrictions in the area of self-esteem. The results of this research project also did not support the findings of Erermis et al. (2004) whom found self-esteem to be lower for the clinical obese group when compared to normal weight participants and scores on the Children's Depression Inventory (CDI) were also higher for both clinical and non-clinical obese participants when compared to normal weight participants.

Although a comparison study was not able to be conducted as part of this research project, as originally intended, the results of this research project did support the previous research in regards to the findings of normal weight participants. This research project did find, among its normal weight participants (four out of five participants in this research project were found to be normal weight), all scored within normal range on both the CES-D depression scale and the SES self-esteem scale. These findings are consistent with the findings of previous researchers who found normal weight adolescents suffered from less symptoms of depression when compared to obese/overweight participants. The findings of this research project are also

consistent with the findings of other research that was reviewed, in that the normal weight participants in this study did not demonstrate decreased self-esteem. This is similar to the findings indicating that normal weight participants do not suffer from decreased self-esteem when compared to obese participants, such as was found in the work of Veugelers (2008), Warschburger (2005) and Erermis et al. (2004). The findings of this research project were also similar to reviewed literature in regards to the results found for underweight participants.

The findings of this research project were also consistent when considering the results of the CES-D scale for the one underweight participant in this research project. The one underweight participant in this research project was found to score high on the CES-D scale, indicating they suffered from symptoms of depression. This is consistent with the work of Whetstone, Morrissey, and Cummings (2007), which found that in addition to obese adolescents, underweight adolescents, specifically male adolescents, also suffer increased symptoms of depression as a result of their weight. Due to low participation in this research project, this researcher was unable to fully investigate the intended research questions. Low participation is one of the many limitations of this research project.

Limitations

This research project drew upon at least ninety participants. Unfortunately, only five participants met participation criteria. If there had been more participation in this research project there would have been a greater likelihood that more participants would have been obese and this researcher would have been more likely to have been able to investigate the intended research questions. Due to low participation, only five participants were selected for participation and four out of five were found to be normal weight and one participant was found to be underweight, therefore a comparison study was not able to be conducted as originally

intended. Due to not being able to conduct a comparison study this researcher was not able to investigate whether obese participants would suffer from depression more than their normal weight peers or whether obese participants would suffer from lower self-esteem when compared to their normal weight peers. In light of low participation in this research project, this researcher was not able to further determine whether a relationship exists between obesity and depression and obesity and self-esteem.

Another limitation to this research project was the participants drawn upon for this research project. The participants for this research project were male and female students ages 14-17 in a high school health class. Due to the age of participants, consent was required from the parent (s) and/or guardian (s) for each participant that was asked to participate in this research project. Gathering consent from the parent(s) and/or guardian(s) was problematic in that the researcher had to rely on consent to be given and to be given in a timely manner by parent(s) and/or guardian(s). Unfortunately, this researcher had to complete two mailings of consent forms to parent(s) and/or guardian(s) because of poor returns. This researcher also had to rely on consent to participate in the research project from the 14-17 year old high school students. This proved to be problematic as it was found that many of the drawn upon participants were unwilling to participate in the research project. Consent from both the drawn upon participant and their parent(s) and/or guardian(s) also proved to be problematic as the researcher needed both consent from the student and consent from their parent(s) and/or guardian(s) for participation criteria to be met. In many cases the research received only consent from the student or only consent from the parent, not consent from both, which resulted in that drawn upon participant being unable to participate in the research project.

Another limitation of this research project was that participants were only drawn from a health class. This limited the exposure of the research project to other students in the high school and, therefore, limiting the researchers options for participation from several different weight students. Had more of the student population been drawn upon for participation in this research project, it is plausible that more consent would have been received by both the student and the parent(s) and/or guardian(s), which in return would have resulted in more students meeting participation criteria.

Lastly, the main limitation of this research project was the topic of research, obesity, itself. Although it has been persuasively argued that obesity is an epidemic sweeping this nation, such as found by Dietz (2004), and more and more adolescents are becoming obese, weight is a sensitive issue whether a one is an adult and perhaps more so in adolescence. Adolescents have a heightened sense of how they are viewed by their peers, taking into great account their appearance, including their weight. It would not be hard to imagine that adolescents would have a difficult time participating in study that targeted their weight. It would also not be hard to imagine that parent(s) and/or guardian(s) might have a difficult time allowing their adolescent to participate in a research project that highlighted weight and issues surrounding weight (i.e. depression and self-esteem). Also, perhaps a more important thought, is that although obesity is becoming increasingly prevalent among adults, children and adolescents, perhaps there is a nation wide resistance to the acceptance of obesity as an epidemic. Perhaps the lack of participation and lack of consent from parent(s) and/or guardian(s) in this research project is actually an indication of the denial of adolescents and adults to what is becoming one of the more prevalent of fatal conditions in the United States. Perhaps the low participation in this research project is an indication of the unwillingness of adults and adolescents to recognize a

very serious problem and the unwillingness of adults and adolescents to bring awareness to a serious problem and ultimately, a solution to a very serious problem. One would have to wonder, if adolescents and adults are not ready to recognize and face such a serious problem, how then, can the problem be solved? If recognition and a solution to such a serious and devastating problem are not developed, what then will be the ultimate outcome to obesity overtaking the youth of our nation?

Implications for counseling

Due to the increasing prevalence and seriousness of obesity in the adults, adolescents and children of today, counselors are going to be faced with new counseling issues to address. As the majority of the reviewed literature indicates, obese adolescents suffer from more symptoms of depression and lower self-esteem when compared their peers of normal weight. Counselors will need to address obese adolescents suffering from symptoms of depression and low self-esteem and perhaps refers these individuals for further mental health evaluation and treatment.

Counselors will need to take a psychoeducational approach to the obesity problem in today's youth. Counselors should push into classrooms and bring awareness to the obesity problem and the physical and psychological implications associated with adolescent obesity. Counselors should collaborate with school staff, faculty and administrators to increase awareness of obesity and its associated problems as well and work with school staff to devise a curriculum or plan to help adolescents eat a healthier diet, engage in more physical activity and increase the mental health stability of the adolescent's of today.

Counselors should also prepare themselves to assist today's youth in dealing with mental health problems they might face as a result of one or both of their parents suffering from obesity and the physical and psychological implications associated with obesity. Counselors will see

more adolescents grieving the loss of a parent and/or guardian due to complications suffered from obesity or counselors might need to ready themselves to lead adolescents in the bereavement process to prepare them for the loss of a parent and/or guardian because of obesity. Counselors will have to help an adolescent through their own problems that they face because obesity and the loss of various physical functions that they might suffer at the hands of obesity. These are only some of the suggestions for counselors when facing such a serious epidemic like obesity. For counselors to understand the obesity epidemic and for more suggestions to be made, obesity and its psychological and physical implications need to be further researched.

Although obesity has been greatly researched, more research needs to be done. For the problem of obesity to be understood more fully and to be recognized more openly, researchers need to come to a more definitive answer as to whether there is a significant relationship between obesity and depression, obesity and self-esteem and other various psychological implications. In further investigating the psychological implications obesity has on the obese persons of today's nation, more awareness and significance can be brought to the condition and in turn more of a solution.

Conclusion

Considering the significance of the obesity epidemic, not only the physical significance, but also the psychological significance, obesity has in the lives of children, adolescents and adults that suffer from it, what will come of today's obese if this problem is not first acknowledged and then appropriately managed? Further research into the physical and psychological effects of obesity needs to be stressed. More importance and awareness needs to be given to the obesity epidemic and to those that currently suffer from obesity or are at-risk for becoming obese. The youth of today and those currently suffering from obesity are at serious

physical and psychological risk if we, as a nation, do not start acknowledging that obesity is a problem and that it is a problem that can be both physically and psychologically devastating, and also fatal to those who suffer from obesity.

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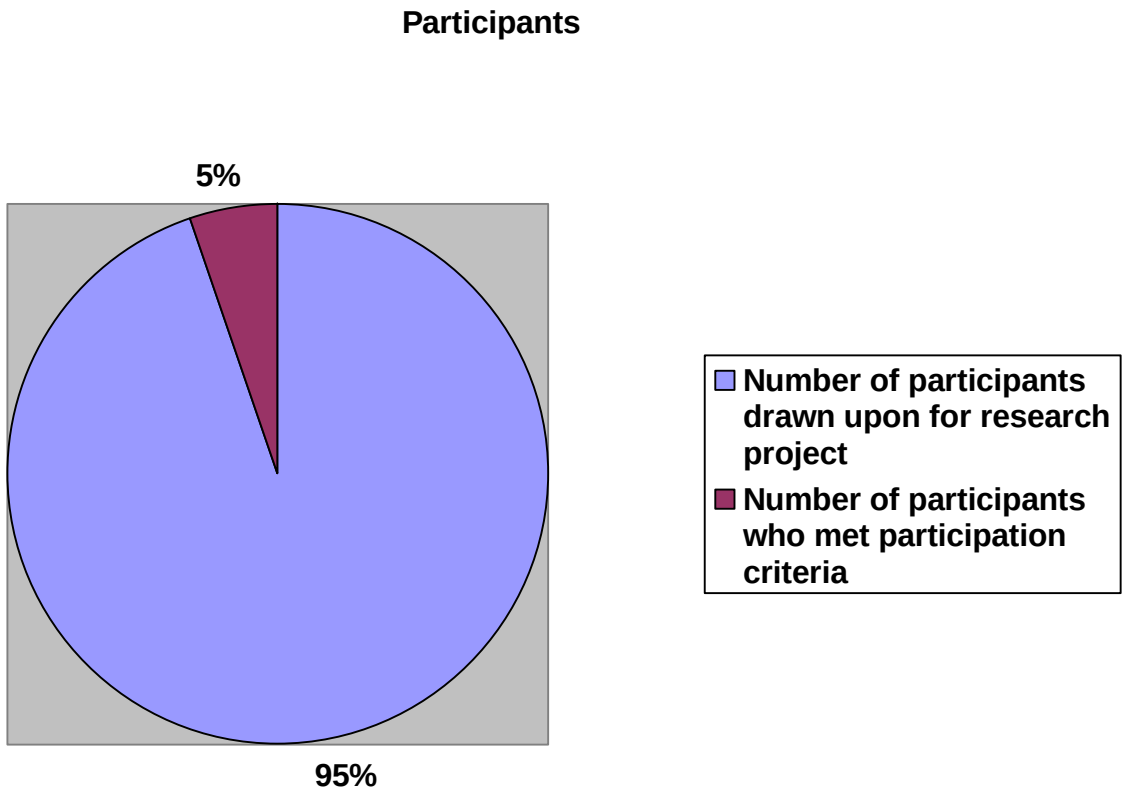

Figure 1. The number of participants asked to participate in this research project versus the actual number of participants for this research project.

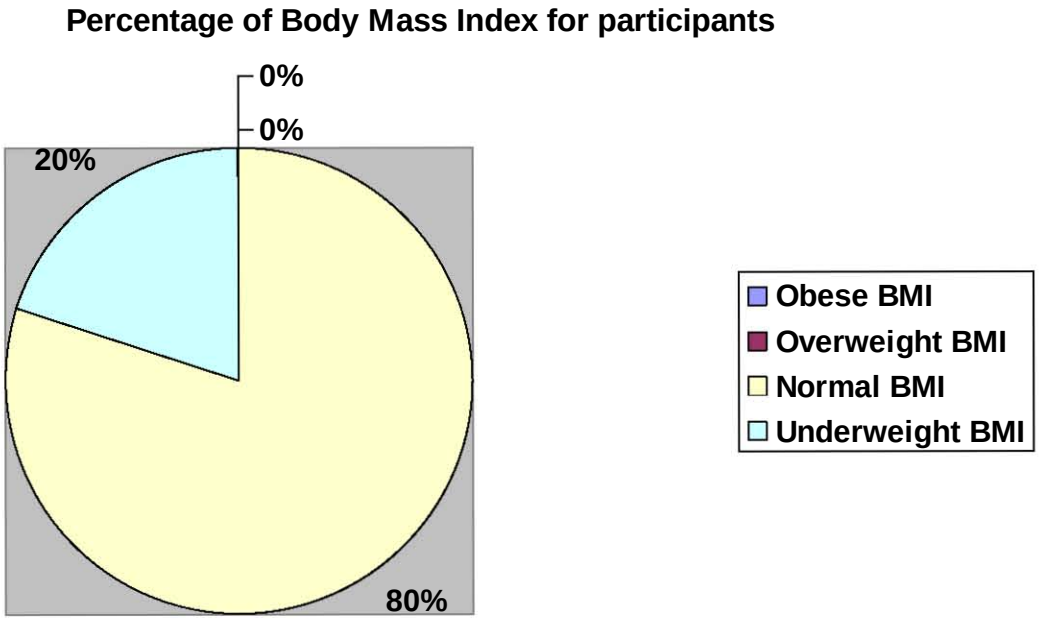

Figure 2. Of the five participants that met selection criteria for participation in this research project, four of the participants had a normal Body Mass Index (BMI) for their age, one had an underweight BMI for their age and no participants had a BMI that was obese or overweight.

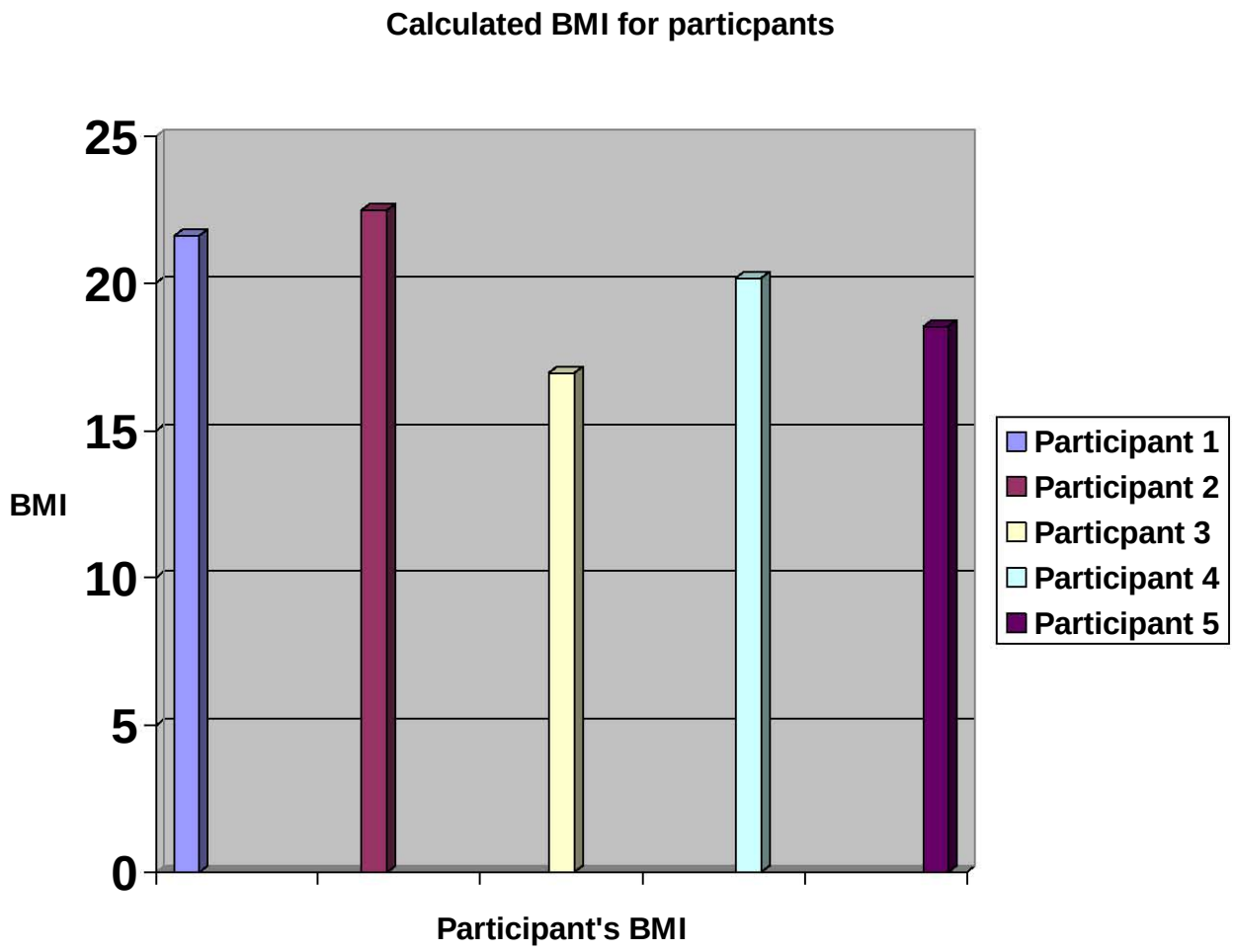

Figure 3. Using the Body Mass Index (BMI) formula of weight (kg)/height (in meters) squared, the BMI for each participant was calculated. Participant number one had a BMI of 21.62, participant number two had a BMI of 22.49, participant number three had a BMI of 16.45, participant number four had a BMI of 20.18 and participant number five had a BMI of 18.54.

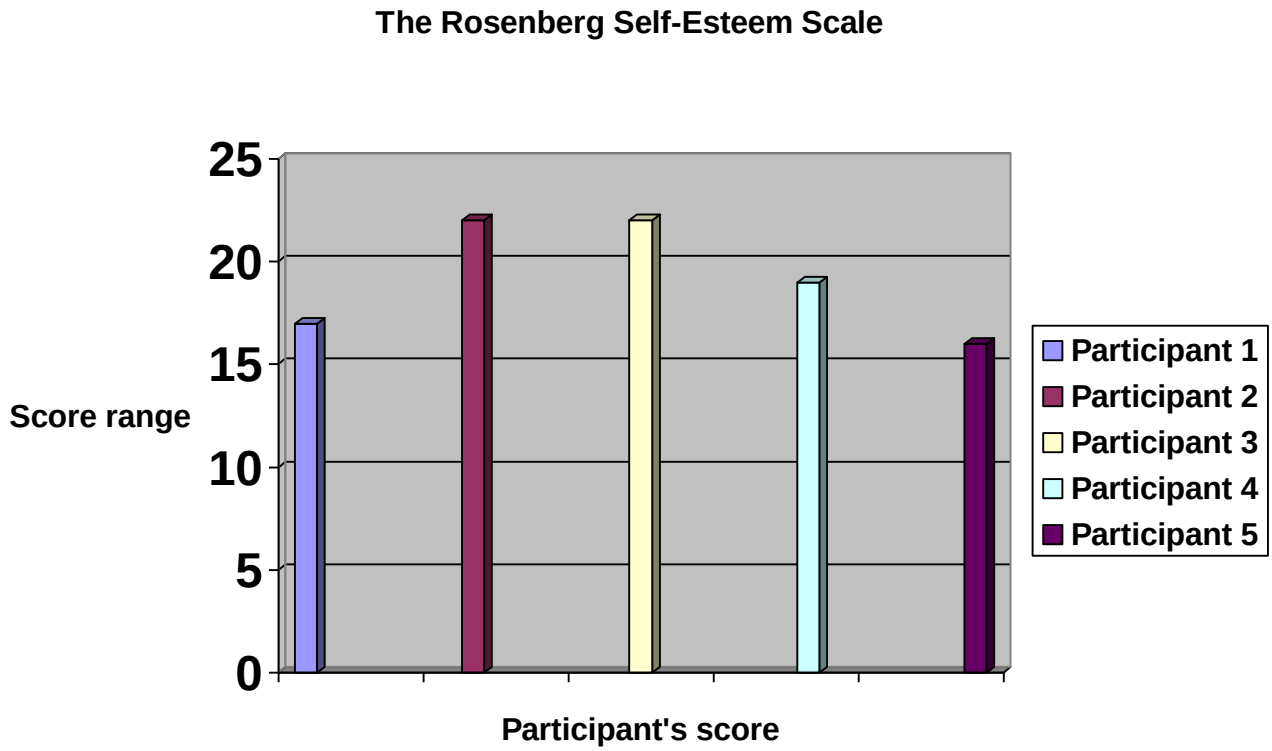

Figure 4. Using the Rosenberg Self-Esteem Scale, each participant was asked to respond to questions using "strongly agree", "agree", "disagree" and "strongly disagree". Each response was given a score of zero-three and scores were added based on a range of zero to thirty. Scores that fell within fifteen to twenty-five were within normal range for self-esteem, scores below fifteen suggested low self-esteem. Participants one through five all scored within normal range for self-esteem.

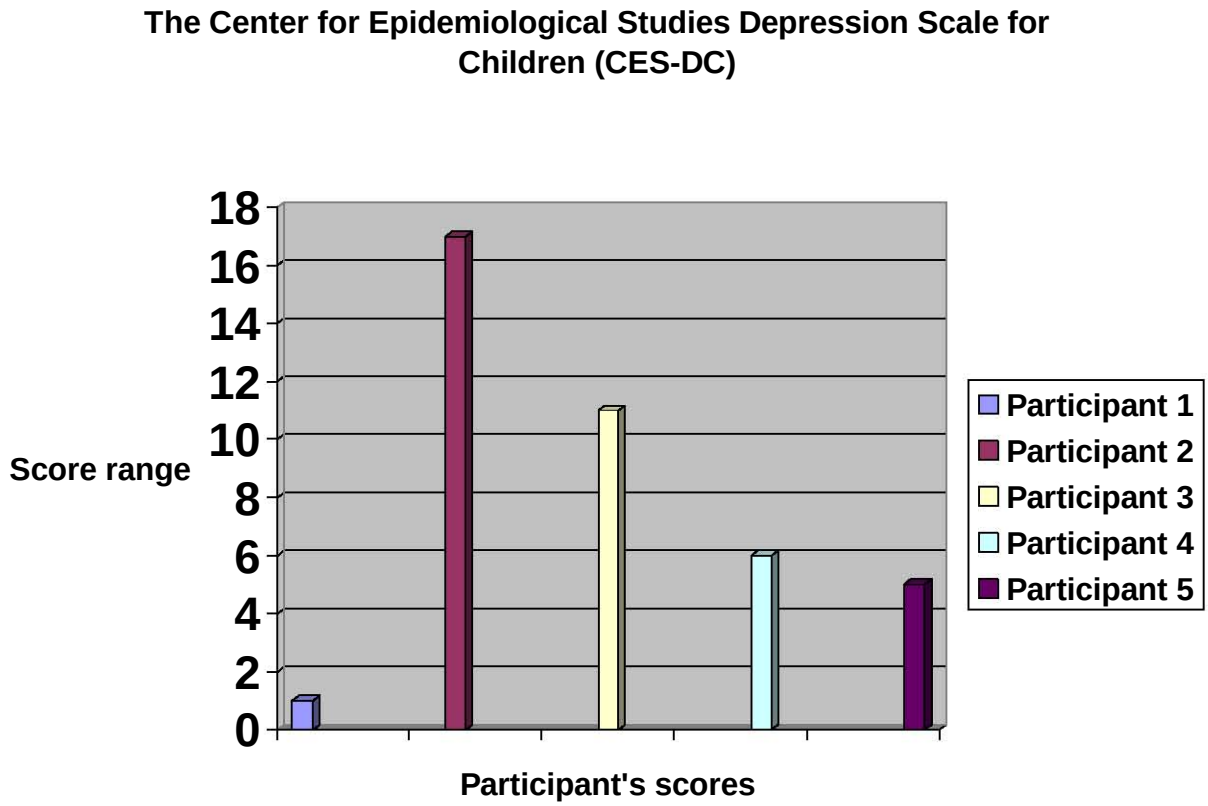

Figure 5. The survey given to participants included the Center for Epidemiological Studies Depression Scale for Children (CES-DC) which include various questions that participants were asked to respond "not at all", "a little", "some" or "a lot". For each question participants were given a score of zero to three, based on their response to the question. Participants total scores were calculated and levels of depression were assessed. Higher scores suggested increasing levels of depression, with a score of fifteen or greater being indicative of significant levels of depression. Only one participant in this research project, participant number two, had a score of seventeen on the scale, suggesting this participant might suffer from symptoms of depression. Participant's number one, three, four and five did not have scores that suggested any level of depression.

Appendix A

Student Consent form

This form describes a research study being conducted with students about their Body Mass Index and assessment of self-esteem and depressive symptoms. The purpose of this research is to conduct a comparison study between normal weight students and students that are above the recommended Body Mass Index for their age, weight and height. The person conducting this research is a graduate student at The College at Brockport SUNY. If you agree to participate in this study, you will be asked to complete a survey about your grade level, age, weight, height sex, and to complete assessment tools used to measure self-esteem and depressive symptoms in adolescents.

The possible benefit from being in this study could be that information will be learned that would allow researchers to gain a better understanding of whether self-esteem and depressive symptoms is correlated to weight.

Your participation in this study is completely voluntary. Being in it or refusing to be in it, will not affect your grades or class standing. You are free to change your mind or stop being in the study at any time.

I understand that:

1. My participation is voluntary and I have the right to refuse to answer any question. I will have a chance to discuss any questions I have about the study with the researcher after completing the questionnaire.

2. My confidentiality is guaranteed. My name will not be written on the survey. There will be no way to connect my name to the written survey. If any publication results from this research, I would not be identified by name. Results will be given anonymously and in group form only, so that neither the participants nor their schools can be identified. Participation will have no effect on grades status.

3. There will be no anticipated personal risks or benefits because of participation in this project. Should any risk occur due to your participation in this project you will have the opportunity to receive counseling at the Palmyra-Macedon High School counseling office.

4. My participation involves reading a written survey of 30 questions and answering those questions in writing. It is estimated that it will take 20 minutes to complete the survey.

5. Approximately 50 people will take part in this study. The results will be used for the completion of a research project by the primary researcher.

6. Data and consent forms will be kept separately in a locked filing cabinet by the investigator and will be destroyed by shredding when the research has been completed.

You are being asked whether or not you will participate in this study. If you wish to give permission to participate, and you agree with the statement below, please sign in the space provided. Remember, you may change your mind at any point and withdraw from the study. Your can refuse to participate even if you have been given permission by your parents to participate.

I understand the information provided in this form and agree to participate as a participant in this project. I have read and understand the above statements. All my questions about my participation in this study have been answered to my satisfaction.

If you have any questions you may contact:

Primary researcher	Faculty Advisor
Name: Lindsay Daniel	Name: Thomas Hernandez
Phone Number: (315) 597-3421	Department and phone number: Counselor Education, (585) 325-2258
Email address: lkirc1@brockport.edu	Email address: thernandez@brockport.edu

_____

Signature of Student

_____

Signature of a witness 18 years of age or older/ Date

Student's name _____

Appendix B

Parent/Guardian consent form

This form describes a research study being conducted with students about their Body Mass Index and assessment of self-esteem and depressive symptoms. The purpose of this research is to conduct a comparison study between normal weight students and students that are above the recommended Body Mass Index for their age, weight and height. The person conducting this research is a graduate student at The College at Brockport SUNY. If you agree to have your child participate in this study, s/he will be asked to complete a survey about his/her grade level, age, weight, height, sex, and complete assessment tools used to measure self-esteem and depressive symptoms in adolescents.

The possible benefit from being in this study could be that information will be learned that would allow researchers to gain a better understanding of whether self-esteem and depressive symptoms are correlated to weight.

Your child's participation in this study is completely voluntary. Being in it or refusing to be in it, will not affect your child's grades or class standing. S/he is free to change her/his mind or stop being in the study at any time.

I understand that:

7. My child's participation is voluntary and s/he has the right to refuse to answer any questions. S/he will have a chance to discuss any questions s/he has about the study with the researcher after completing the questionnaire.

8. My child's confidentiality is guaranteed. Her/his name will not be written on the survey. There will be no way to connect my child to the written survey. If any publication results from this research, s/he would not be identified by name. Results will be given anonymously and in group form only, so that neither the participants nor their schools can be identified. Participation will have no effect on grades status.

9. There will be no anticipated personal risks or benefits because of participation in this project. Should any risk occur to your child as a result of their participation in this project they will have the opportunity to receive counseling at the Palmyra-Macedon High School counseling office.

10. My child's participation involves reading a written survey of 30 questions and answering those questions in writing. It is estimated that it will take 20 minutes to complete the survey.

11. Approximately 50 people will take part in this study. The results will be used for the completion of a research project by the primary researcher.

12. Data and consent forms will be kept separately in a locked filing cabinet by the investigator and will be destroyed by shredding when the research has been completed.

You are being asked whether or not you will permit your child to participate in this study. If you wish to give permission to participate, and you agree with the statement below, please sign in the space provided. Remember, you may change your mind at any point and withdraw from the study. Your child can refuse to participate even if you have given permission for her/him to participate.

I understand the information provided in this form and agree to allow my child to participate as a participant in this project. I am 18 years of age or older. I have read and understand the above statements. All my questions about my child's participation in this study have been answered to my satisfaction.

If you have any questions you may contact:

Primary researcher	Faculty Advisor
Name: Lindsay Daniel	Name: Thomas Hernandez
Phone Number: (315) 597-3421	Department and phone number: Counselor Education, (585) 325-2258
Email address: lkirc1@brockport.edu	Email address: thernandez@brockport.edu

_____

Signature of Parent /Date

Child's name _____

Appendix C

Survey

Grade: _____

Age: _____

Sex: _____

Weight: _____

Height: _____

Please answer the following series of questions honestly. Your participation in the contents of this survey is greatly appreciated. Thank You!

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

1. On the whole, I am satisfied with myself.
SA
A
D
SD

2. At times, I think I am no good at all.
SA
A
D
SD

3. I feel that I have a number of good qualities.
SA
A
D
SD

4. I am able to do things as well as most other people.
SA
A
D
SD

5. I feel I do not have much to be proud of.
SA
A
D
SD

6. I certainly feel useless at times.
SA
A
D
SD

7. I feel that I'm a person of worth, at least on an equal plane with others.
SA
A
D
SD

8. I wish I could have more respect for myself.
SA
A
D
SD

9. All in all, I am inclined to feel that I am a failure.
SA
A
D
SD

10. I take a positive attitude toward myself.
SA
A
D
SD

Rosenberg, Morris. 1989. *Society and the Adolescent Self-Image*. Revised edition. Middletown, CT: Wesleyan University Press.

INSTRUCTIONS: Below is a list of the ways you might have felt or acted. Please circle how much you have felt this way during the past week.

DURING THE PAST WEEK:

1. I was bothered by things that usually don't bother me.
Not At All
A Little
Some
A Lot

2. I did not feel like eating, I wasn't very hungry.
Not At All
A Little
Some
A Lot

3. I wasn't able to feel happy, even when my family or friends tried to help me feel better.
Not At All
A Little
Some
A Lot

4. I felt like I was just as good as other kids.
Not At All
A Little
Some
A Lot

5. I felt like I couldn't pay attention to what I was doing.
Not At All
A Little
Some
A Lot

DURING THE PAST WEEK:

6. I felt down and unhappy.
Not At All
A Little
Some
A Lot

7. I felt like I was too tired to do things.
Not At All
A Little
Some
A Lot

8. I felt like something good was going to happen.
Not At All
A Little
Some
A Lot

9. I felt like things I did before didn't work out right.
Not At All
A Little
Some
A Lot

10. I felt scared.
Not At All
A Little
Some
A Lot

DURING THE PAST WEEK:

11. I didn't sleep as well as I usually sleep.
Not At All
A Little
Some
A Lot

12. I was happy.
Not At All
A Little
Some
A Lot

13. I was more quiet than usual.
Not At All
A Little
Some
A Lot

14. I felt lonely, like I didn't have any friends.
Not At All
A Little
Some
A Lot

15. I felt like kids I know were not friendly or that they didn't want to be with me.
Not At All
A Little
Some
A Lot

DURING THE PAST WEEK:

16. I had a good time.
Not At All
A Little
Some
A Lot

17. I felt like crying.
Not At All
A Little
Some
A Lot

18. I felt sad.
Not At All
A Little
Some
A Lot

19. I felt people didn't like me.
Not At All
A Little
Some
A Lot

20. It was hard to get started doing things.
Not At All
A Little
Some
A Lot

Developed by Radloff, L.S. (1977) 'The CES-D scale: A self-report depression scale for research in the general population'. *Applied Psychological Measurement I: 385-401*. Adapted by Bright Futures in Practice from Radloff's "Center for Epidemiological Studies Depression Scale Modified for Children (CES-DC)" (Bright Futures in Practice 2: 57-58)