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Obesity and Eating Disorders Prevention Programs: Effects on Adolescents and Young Adults With Weight Related Conditions

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OBESITY AND EATING DISORDERS PREVENTION PROGRAMS: EFFECTS ON ADOLESCENTS AND YOUNG ADULTS WITH WEIGHT-RELATED CONDITIONS

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Abstract

Background: With implementation of healthy weight education programs throughout schools, questions have been raised whether a preoccupation with obesity prevention contributes to an increase in the incidence of eating disorders. The purpose of this critical review of research is to compare obesity prevention programs and eating disorder prevention programs and possible unintended negative effects on adolescents with weight-related conditions.

Theoretical Framework: Neuman Systems Model and Erickson's Psychosocial Development were used. While Neuman theorizes a human being is a total person characterized by physiological, psychological, sociocultural, spiritual, and developmental factors, Erickson focuses on identity versus role confusion at the adolescent age.

Methods: This literature review was conducted to include studies surrounding eating disorders and obesity among youth and adolescents utilizing the CINAHL, PubMed, and PsycINFO databases.

Results: Broadening the scope of focus to address the full spectrum of weight-related problems can guide the development of interventions that simultaneously address unhealthy weight-control behaviors.

Conclusion: There is a need for healthcare professionals to be acutely aware of eating behaviors within the adolescent age group. Recognizing risk factors for weight-related disorders is an essential component to prevent and predict risky behavior. Educational programs/tools to measure eating disorders and weight-related behaviors offers benefit to explore behaviors of preoccupation with body image and dietary restrictions.

Implications for Research and Practice: Relationships between body shame and low self-esteem leading to negative weight-related behaviors have been identified. Additional research is needed to examine the relationship between weight-related behaviors and negative body image.

Keywords: Eating disorder, obesity, prevention, adolescents

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Chapter 1: Introduction

The purpose of this literature review is to compare obesity prevention programs and eating disorder prevention programs and possible unintended negative effects on adolescents with weight-related conditions. There are an abundance of well-intentioned programs aimed at obesity prevention. Consequently, prevention efforts to address obesity and body dissatisfaction need to account for the possibility of contributing to disordered eating behaviors resulting in unhealthy weight control, binge eating, or clinical eating disorders (Neumark-Sztainer, 2009). With the increased implementation of healthy weight education programs throughout schools worldwide, questions have been raised about whether a preoccupation with obesity prevention contributes to an increase in the incidence of eating disorders. Since 2008, there have been scores of childhood and adolescent obesity programs aimed at prevention using interventional strategies to influence eating patterns and activity (United States Department of Agriculture, 2017). The National Association of Anorexia Nervosa and Associated Eating Disorders (ANAD, 2017) noted that the incidence of eating disorders has

increased over the past 30 years. As concerns arose surrounding the preoccupation with body image and eating disturbances, could these health promotion messages contribute to the unintentional increase in the prevalence of unhealthy weight control behaviors?

In 2015, according to The Centers for Disease Control and Prevention (CDC), adolescents were considered at risk for obesity with a body mass index (BMI) between the 85th and 95th percentiles for age and gender. A BMI at or above the 95th percentile is considered obese. BMI is a valuable indicator of body fat level based on height, weight, and age. Age and gender-specific measurements are used to calculate BMI; body compositions in children vary as they age and vary between boys and girls, so age and gender parameters are used (CDC, 2015). Growth charts are a secondary method for measuring growth. Growth charts illustrate the distribution of selected body measurements (weight, height) via a series of percentile curves. Although both methods are acceptable for standard growth determination, the BMI method has gained increased acceptability by the CDC to determine if a child is overweight. A BMI calculation can indicate body fatness; however, BMI does not measure body fat directly. BMI is considered an alternative to direct body fat measures and is considered a weight screening tool. See Appendix A for growth charts that take into consideration stature-for-age, height, and weight-for-age. See Appendix B for boys' BMI for age percentile chart, girls' BMI percentile chart, and BMI-for-age percentile growth chart of a 10-year-old-boy that displays the percentile for obese, overweight, healthy, and underweight.

The National Institute of Mental Health (n.d.) defines eating disorders as an obsession with food, body weight, and shape leading to a serious disturbance of eating

behavior. Examples of eating disorders include anorexia nervosa, bulimia nervosa, and binge-eating disorder. The continuum of eating disorders incorporates disordered eating behaviors. Symptoms or characteristics of disordered eating are becoming angry when hungry, obsessively thinking about food and calories, not being able to select what to eat, food seeking to compensate for psychological problems, eating until feeling sick, and eating and weight presented as unreal myths and beliefs (Leme et al., 2017).

Need for Critical Review of a Nursing Problem

There are numerous and powerful statistics surrounding eating disorders. The National Eating Disorder Association (NEDA, 2016) estimated that eating disorders affect approximately 20 million women and 10 million men in the United States each year. These disorders do not consider demographics; any age, race, gender, or socioeconomic group may be affected. Traditionally, eating disorders were thought to be limited to young, white females (Sala, Reyes-Rodriguez, Bulik, & Bardone-Cone, 2014). Sala et al. (2016) noted inconsistencies in methodology and limited research in diverse populations and limited overall knowledge in the subject area of eating disorders across other ethnicities. According to Levinson and Brosof (2016), eating disorders are increasing throughout ethnic minority groups in the United States as well as Asian countries. See Table 1 for a description of eating disorder prevalence rates across groups. Trepal, Ioana, and Kress (2012) found similar rates of adolescents with eating disorders in Western and non-Western communities. Globalization has been an equalizer for what

was once known as a "culture-bound disorder" (Patel, 2008, p. 20). According to Patel (2008), countries such as Fiji and India have been impacted by media exposure. Historically those countries were media-immune; however, as media exposure increases, eating disorder rates have risen. Therefore, evidence demonstrates eating disorders present across all diverse ethnic groups and populations.

Table 1. Eating disorders prevalence rates across cultural groups.

Ethnic/Cultural Group	Prevalence of AN	Prevalence of BN	Prevalence of BED
Japan	0.43%	2.32%	3.85%
China	1.05%	2.98%	3.53%
India	0.002%	0.4%	--
Pakistan	--	0.00-0.2%	--

AN = anorexia nervosa; BN = bulimia nervosa; BED = binge eating disorder.

Table 1. The above table demonstrates the overall eating disorder prevalence rates for women across cultural groups (Levinson & Brosof, 2016). Adapted from Levinson & Brosof, 2016.

There is no known specific cause of eating disorders, but there are multiple biological, psychological, and sociocultural components that may contribute to the development of an eating disorder (NEDA, 2016). According to the ANAD (2017) and the Diagnostic and Statistical Manual, Fifth Edition (DSM-5, 2013), the three most prevalent types of eating disorders are anorexia nervosa, bulimia nervosa, and binge

eating disorder (BED). However, other defined eating disorders include: Avoid/Restrictive Food Intake Disorder, Other Specified Feeding or Eating Disorder, Unspecified Feeding or Eating Disorder, Pica, and Rumination Disorder. For example, the ANAD (2017) revealed in the population of adolescent girls, 5.2% have disordered eating behaviors such as anorexia, bulimia, and binge eating disorders. Additionally, the total increases to 13.2% with the inclusion of nonspecific eating disorder symptoms (ANAD, 2017). This paper will focus on identifying if adolescents are likely to develop disordered eating (including eating disorders and obesity) when exposed to messaging related to healthy eating and anti-obesity campaigns.

The National Association of Anorexia Nervosa and Associated Eating Disorders defines anorexia nervosa (AN) as significantly low body weight and inadequate calorie intake (ANAD, 2017). Individuals with anorexia nervosa often demonstrate an intense fear of weight gain or becoming fat (ANAD, 2017). Additionally, an individual with AN may refuse to eat often, may obsessively exercise, or utilize laxatives for weight loss. Over time, AN will cause the body to go into starvation, which may lead to a myriad of symptoms, including: amenorrhea, osteopenia/osteoporosis, brittle hair/nails, dry skin with a yellowish-hue, constipation, decreased blood pressure and/or heart rate, decreased body temperature, and strong potential for organ (kidney, heart, liver) damage/failure (American Psychiatric Association, 2017). A diagnosis of anorexia nervosa is made when an individual weighs less than 15% of their normal weight in consideration of weight, age, and height. The CDC (2018) defines normal body weight as a healthy weight of an adolescent in consideration of weight, gender, and height. Additionally, the

CDC uses body mass index (BMI) calculations to determine if weight is within the normal range of the CDC recommendations.

Bulimia nervosa (BN) is characterized by frequently eating a significant amount of food containing thousands of calories in a short period of time (APA, 2017). According to the American Psychiatric Association (APA), individuals with BN are not necessarily underweight; they can be of average weight, overweight, or even obese, and they lack a sense of control over the eating sessions. With BN, the key is that the individual cannot regulate the amount of food eaten or cannot stop eating. Of note, extreme thinness is not a characteristic of individuals with BN, and thus this condition often goes unnoticed. Bulimia nervosa could be a hidden diagnosis because of the uncharacteristic signs and symptoms displayed as well as the individual's desire for secrecy. The hallmark of BN is self-induced vomiting (purging) or laxative misuse after eating large portions of food. The cycle of purging or laxative usage may occur once a week or several times a day, depending upon the severity of the illness (APA, 2017). Symptoms of BN include chronically inflamed throat and sore throat, tooth decay and worn off tooth enamel, kidney problems due to diuretic usage, and intestinal problems due to laxative abuse.

Although not causing an individual to be underweight, the APA classifies binge eating disorder (BED) as an eating disorder. Binge eating disorder is characterized by eating large amounts of food in a concise period and having uncontrolled feelings toward eating during the binge (APA, 2017). Binge eating disorder is defined by out-of-control eating at least once a week for three months. Additionally, three or more of the following symptoms are present: 1) eating at a fast pace, 2) feeling uncomfortably full

after eating, 3) although not physically hungry, eating large amounts of food, 4) eating alone to avoid embarrassment, and/or 5) feeling guilty, depressed, or disgusted with oneself after eating (APA, 2017).

According to the Centers for Disease Control and Prevention (2015), obesity rates among adolescents in the United States and worldwide are on the rise, as evidenced by the fact that one in three adults and one in six adolescents are obese. The American Academy of Pediatrics (AAP), (2015) noted that over the past 30 years, obesity rates have tripled in the adolescent population. With attention turned to adolescents, those who are overweight have an increased incidence of being overweight in adulthood as well (Deshmukh-Taskar et al., 2006). Obesity during younger years has an increased risk for adult-type health conditions such as diabetes, heart disease, osteoarthritis, and various types of strokes (AAP, 2015).

Adolescent obesity does not stand alone without short and long-term health consequences. Reilley and Kelly (2011) found an increase in premature adult adverse health conditions with the incidence of youth/adolescent obesity. These health conditions include physical conditions that are cardiometabolic in nature (diabetes, hypertension, ischemic heart disease, and stroke), as well as mental health conditions. Additionally, factors that should be considered regarding obesity are environmental, economic, and socio-environmental (Horst et al., 2007). Horst gave several examples of these factors which included fruit/vegetable intake, snack/fast food intake, fat intake, parental dynamics, energy expenditure, and parental behavior. Reilley and Kelly (2011) stated that both food choices and activities are behaviors that may be modified to support a more healthful lifestyle leading into adulthood. Incorporating health education, nutrition, and

physical activity around anti-obesity programs may be impactful (Quick, Wall, Larson, Haines, & Neumark-Sztainer, 2013).

The AAP reported that eating disorders are the third most common chronic condition in adolescents, behind obesity, which is the second most common condition (Golden, Schneider, & Wood, 2016). Although eating disorders and obesity might seem to be on opposite ends of the spectrum, these conditions share many similarities. Weight-related disorders may overlap as a person moves from one condition (obesity) to another (unhealthy dieting), and it may be beneficial to consider both issues simultaneously. Recent findings suggest that eating disorders and obesity are part of the same continuum of weight-related disorders (Golden et al., 2016).

Significance to Nursing

Eating disorders are often associated with severe medical and mental health issues, as well as death. Damage to kidneys, heart, and liver are potential complications of eating disorders (APA, 2017) along with depression, low self-esteem, shame, guilt, mood swings, and perfectionism (ANAD, 2017). Complications of youth/adolescent obesity include physical conditions that are cardiometabolic. These cardiometabolic conditions may plague adulthood with diabetes, hypertension, ischemic heart disease and stroke, nonalcoholic fatty liver disease, sleep disorders, and asthma (Reilly & Kelly, 2011). Additionally, research demonstrates social and emotional conditions producing anxiety and depression because of obesity. The social and emotional conditions include low self-esteem, being bullied, and behavior and learning problems (Mayo Foundation for Medical Education and Research, 2017). Across the weight spectrum, the intersection of eating disorders and youth/adolescent obesity has common underpinnings of

psychological components. Due to the desire to shed a high weight status, normal weight adolescents and obese adolescents are at a higher risk of developing an eating disorder. Sim, Lebow, and Billings (2013) found normal weight adolescents are just as likely to develop eating disorders as obese adolescents. Care needs to be taken not to overlook weight loss in the light of eating disorders. Even though an adolescent may not receive a diagnosis as underweight, a subclinical disordered eating pattern may be present if dramatic weight loss is overlooked as healthy (Miller, 2014). Weight loss is often viewed as positive; therefore, indicators of dangerous weight control methods may be neglected or difficult for healthcare providers to detect (Sim et al., 2013). An extensive study by Croll, Neumark-Sztainer, Story, and Ireland (2002) revealed that AN developed when the adolescent was obese because of disordered eating behaviors. Within the Cross et al., (2002) study, of the adolescents that were obese, one-third of males and over one-half of females were found to have disordered eating. Appropriate screening questions asked by the primary care provider are paramount so that disordered eating behaviors are identified and resources provided. Therefore, identifying those individuals at risk of disordered eating (including eating disorders and obesity) is of great importance for minimal delay in treatment. Delaying treatment until symptoms progress and physical and psychological sequelae are severe may potentially decrease the effectiveness of treatment and cause a need for increased intensity of treatment (Sim et al., 2013).

Disordered eating patterns are multifaceted conditions. Nurses have a plethora of skills to offer patients battling these conditions, including emotional and physiologic support during recovery, role model support, surveillance of case management, and direct care (NEDA, 2017). Additionally, because of a complex spectrum of therapeutic skills,

nurses offer flexibility, empathy, and the ability to meet the requirements of changing and shifting patient needs. These patients have multifaceted and critical needs; all body organs and systems may be affected. Thus, a solid foundation in nursing knowledge is essential for treatment and recovery. Often treatment for disordered eating is interprofessional and includes a therapist, physician, nutritionist, social worker, nurse educator, nurse, and nurse practitioner. This approach addresses both the psychological and medical consequences of disordered eating (NEDA, 2017). Nurse educators may advocate for the inclusion of weight-related disorders in the nursing education curriculum. Additionally, nurse educators may impact the treatment course of a patient with an eating disorder based on a comprehensive assessment and ability to provide a biopsychosocial emphasis and a holistic approach. This assessment may include having a full understanding of the medical and treatment history, mental status, and core eating disorder symptoms. These actions may optimize the health status, nutrition, cognition, coping, and medical stability of the patient.

Theoretical Framework

The theoretical framework for this topic will be supported by the Neuman Systems Model (www.neumansystemsmodel.org, n.d.). This theory advocates for a partnership between caregivers and patients, co-mingling an understanding of the patient's relationship with their environment (McEwen & Wills, 2014). This system's theory encompasses the entire patient as an interactive body, characterized by five variables: physiological, psychological, sociocultural, developmental, and spiritual. In addition, the theory surrounds the decision-making process concerning the levels of prevention as well as intrapersonal, interpersonal, and extra-personal stressors related to

eating disorders (McEwen & Wills, 2014). Prevention focuses on averting stressors and the response of stress from having adverse effects on the body. Averting stressors promotes healthy eating habits, wellness, and a healthy body image. From the standpoint of adolescents, multiple stressors may have a consequence on wellbeing, including intrapersonal stressors such as fear of failure or rejection, interpersonal stressors such as pressure from peers, and extra-personal stressors such as financial instability or family difficulties.

Because the Neuman Systems Model views a patient as an open system that is responsive to stressors within their environment, the aforementioned patient variables have an essential role in protecting the core structure (McEwan & Wills, 2014). The normal line of defense identifies as a usual level of health. The lines of defense are flexible so that the core may be protected (McEwan & Wills, 2014). The Neuman Systems Model suggests that as stress accumulates and is pushed aside, patients may use a flexible line of defense, thus protecting the self from invasion by stressors. Within this theory, Neuman noted lines of resistance are internal factors that are activated when stressors infiltrate the normal line of defense; the lines of resistance will determine a response to the stressor (Ahmadi, 2017). An adolescent's use of food or restricting food may be a line of defense to avoid stressors. Those adolescents who suffer from mental health issues associated with disordered eating have a disrupted normal development that can interfere with education and social interaction (U.S. Department of Health and Human Services, 2017), thus causing them to utilize the lines of defense. The environment is a crucial concept within Neuman's theory because both the internal, external, and created forces of the environment affect an individual and may interact at

any given time. Environmental factors that are positive equate to wellness with the total body system's needs being met. A positive environment will act as a preventative, corrective, and rehabilitative place. Negative environmental factors may penetrate the flexible or normal lines of defense to produce an illness state, such as physical instability of infection, impaired vital signs, or thoughts or feelings of self-harm (Ahmadi, 2017).

The Neuman Systems Model focuses on prevention as intervention, which relates to obesity as well as eating disorders (McEwan & Wills, 2014). Intervention or coping strategies may focus on the response of an individual's stability by preventing stress and providing support. This theoretical model works to promote, maintain, and restore the health of individuals via primary, secondary, or tertiary prevention lines of defense. These lines of defense are preventative whereas the primary line of defense focuses on protection of the normal line of defense with strengthening the flexible lines of defense (McEwan & Wills, 2014). The secondary line of defense hones in on reducing the reaction of a stressor and increasing resistance. The secondary line works to prevent damage to the central core. Tertiary prevention focuses on recovery, readaptation, and stability (McEwan & Wills, 2014). Additionally, the Neuman Systems Model addresses stability (state of balance or harmony), which is imperative to mental health allowing for retention of optimal health and preserving overall body system integrity. When considering disordered eating, adequate coping skills are germane to mental health, as this will help the patient heal both physically and mentally (McEwan & Wills, 2014).

In addition to Neuman's System Model, there is value to include Erickson's Psychosocial Developmental Theory in the realm of unhealthy weight control behaviors

(McEwan & Wills, 2014). In relation to weight-related conditions, Erickson's Psychosocial Development outlines the stages of a person's life from birth to death with an emphasis on the adolescent stage. Erickson theorized that adolescence is a time when an individual makes the transition from child to adult with significant influences on personality (McEwan & Wills, 2014). As the person moves from one stage to the next, there is a formation of the total person (McEwan & Wills, 2014). Adolescent psychosocial development is essential because low self-concept at this stage may increase the risk of developing unhealthy eating patterns. According to Erickson, an inner readiness and outer opportunities along with a sense of excitement and joy, make up a person's own time for development (McEwan & Wills, 2014). Thus, exploring an adolescent's sense of identity and expectations from society may impact self-perception and influence disordered eating habits.

The duality of the two models encompasses the adolescent stage of development. Human development is a commonality to both theories. While Neuman theorized a human being is a total person characterized by physiological, psychological, socio-cultural, spiritual, and developmental factors, Erickson focused on identity versus role confusion at the adolescent age (McEwan & Wills, 2014). According to Erickson, if an adolescent has a conflict during the childhood stage such as trusting others or believing in themselves, they may experience an identity crisis or role confusion. The person would not move into the next psychological stage; thus, the adolescent may withdraw from responsibilities (DuBois, Rodgers, Franko, Eddy, & Thomas, 2017). Erickson and Neuman both explore the sense of identity as a whole in connection to one's perceptions of self. If an adolescent enters a psychological crisis (unhealthy weight control behaviors)

due to stressors, this will break down lines of defense and penetrate the core of a person and not permit sound decision making toward eating and feeding.

Research Question

There has been much research regarding the increase in body weight in adolescents over the past 20 to 30 years (CDC, 2015). At the same time, research has shown that there has also been an increase in eating disorders in the adolescent population. School curriculum has included weight-related content (in health classes) since 2006 (Larson, Davey, Caspi, Kubik, & Nanney, 2016). In the United States, the Child Nutrition and Women, Infants, and Children (WIC) Reauthorization Act of 2004 established that schools needed to implement a wellness policy that included behaviors associated with weight in the school environment (Larson et al., 2016). The United States Department of Agriculture (USDA) required wellness policies if the local educational agency (LEA) or school district participates in the National School Lunch Program and/or School Breakfast Program. The LEA or school district will not receive funding for the lunch and/or breakfast programs without establishing wellness policy (USDA, 2016). The criteria for the wellness policy must specify goals for nutrition promotion and education, physical activity, and promotion of school-based wellness activities (USDA, 2016). These well-intended programs explore strategies for preventing obesity, health promotion strategies, reducing eating disorders and disordered eating, and address healthy eating habits and healthy weight habits. Additionally, the curriculum may include portion control strategies, healthy lifestyles, ideas for physical activity, and weight-related messaging (Wilksch et al., 2014). This literature review will explore the question: Among adolescents with weight-related disorders (obesity and eating

disorders), as concerns arise surrounding the preoccupation with body image and eating disturbances, could these health promotion messages contribute to the unintentional increase in the prevalence of unhealthy weight control behaviors?

Summary

Eating disorders affect 20 million women and 10 million men each year (CDC, 2015). An eating disorder may affect any age, race, gender, or socioeconomic group. According to the CDC (2015), obesity rates among adolescents in the United States, and across the globe are on the rise, as evidenced by one in three adults being obese and one in six adolescents being obese. Concerns arise surrounding the preoccupation with body image, dietary restriction, and if health-promoting messaging is prompting an unintentional effect of disordered eating behaviors. Therefore, this research will address adolescents with weight-related disorders (obesity and eating disorders) and if there are commonalities between obesity prevention programs and eating disorder prevention programs in fostering a negative effect on youth or adolescents. The Neuman Systems Model (n.d.) will be integrated into this review because it encompasses the decision-making process regarding the interactive levels of prevention as well as intrapersonal, interpersonal, and extrapersonal stressors. Additionally, Erickson's Psychosocial Developmental Theory will lend further support in the realm of stages of human development. These nursing frameworks incorporate holism concerning the physiological, psychological, sociocultural, developmental, and spiritual human development.

CHAPTER 2: Method

Chapter two will describe the methods used for the critical review of the literature. This chapter will detail the databases, search engines, search strategies, and the criteria for including or excluding research studies. Additionally, this chapter will include a summary of the number and types of studies selected for the literature review.

Criteria for Including and Excluding Research Studies

This literature review was conducted to include studies surrounding eating disorders and obesity among youth and adolescents utilizing the CINAHL, PubMed, and PsycINFO databases. The articles incorporated were between the years 2010 and 2017. Articles before 2010 (dating back to 2002) were used only for background information and knowledge. Historical articles contributed to foundational knowledge about trends in adolescent eating behaviors. Deliberately examining the history of weight-related eating gave insight to the knowledge and perspective surrounding this topic. The search intended to locate and identify studies concerning experimental, quasi-experimental, non-experimental, qualitative, quantitative, and summaries of research evidence with all levels of research reviewed (Dearholt & Dang, 2014). Several articles were found

isolating obesity or eating disorders, but these articles were excluded since the intent of this project is to view these conditions in relation to each other.

Search and Review Process

Studies were selected by using the methodological filters *and, or,* and *not*. A comprehensive review and search was conducted, which resulted in both the number of reports and the total number of studies that were specifically related to the project. A full review of the reports was screened looking for inclusion and exclusion criteria.

Number and Types of Studies Selected

The terms eating disorder, obesity, prevention, adolescents, and or, were inputted into the CINAHL database resulting in 291,166 studies. Additionally, the criteria for the years 2010 through 2017 was entered. Seventy studies were found using the same criteria but instead using the filter and. Using the PsycINFO search engine with the same criteria as above, 462,854 studies were identified using the filter *or*. Six-hundred-and-five studies were discovered when the filter *and* was applied. When using the PubMed search engine, seven studies matched the criteria of obesity, eating disorders, adolescents, and prevention.

Criteria for Evaluating Research Studies

The evaluation of research studies included the removal of duplicate studies, as well as the dates of the studies. In addition, relevant titles and abstracts were screened for pertinence to this project. Upon completion of the preliminary work, an assessment of the inclusion and exclusion criteria was performed by reading the full text of the study. Criteria for utilization of research studies included involving adolescents and young adults. The American Academy of Pediatrics defines adolescence as people age 10 to 21

years old and people age 20-26 are emerging (young) adults (Bell, Breland, & Ott, 2013). The National Alliance on Mental Illness (NAMI) defines the terms eating disorder and disordered eating as a preoccupation with food and weight issues; this preoccupation negatively impacts health, emotions, and all aspects of life (NAMI, 2018). The search included information from domestic and international research studies and data. Countries involved in the research were the United States of America, Italy, Malaysia, and Australia. Data was retained from the studies to meet the following criteria: global information (authors, journal, and year of publication), the aim of the study, the design of the study, and keywords used for the study. During the evaluation process, it was important to keep a watchful eye for bias (limitations, an intention of the application of the study, data analysis practices or bias during the study). When bias is understood, the reader may have the best ability to differentiate information to review independently and critically.

Summary

The review utilized current data regarding eating disorders, obesity, and weight-related behaviors. Quality, level of strength, and content were reviewed to determine if placement on the matrix was appropriate. The Johns Hopkins Evidence Level and Quality Guide (Dearholt & Dang, 2012), as well as the Johns Hopkins Research and Evidence Appraisal Tool (Dearholt & Dang, 2012), were helpful in identifying articles that met the benchmarks of strength and quality. Utilizing the Johns Hopkins Research and Evidence Appraisal Tool assisted in determining the strength of evidence found in research articles. These tools assisted in establishing the acceptance or rejection of articles containing evidence-based practice. For this capstone, evidence of high quality

represented best practice; conversely, lower strength and quality represented low quality. Articles placed on the matrix were relevant to this topic and were of the highest quality identified in the search process. In total, the literature review included the analysis of two cross-sectional studies, one repeated cross-sectional study, one longitudinal study, three experimental studies, one quasi-experimental study, three randomized control trial studies, one case report, one retrospective cohort study, one meta-analysis study, and two systematic review studies.

Chapter Three: Literature Review and Analysis

The literature review within the current body of knowledge revealed numerous studies across the continuum regarding obesity and eating disorders as individual topics. This literature review will analyze the constructs of several topics including: prevention programs across the spectrum of eating disorders and obesity, negative effects of well-intended programs aimed at obesity prevention, negative effects of well-intended programs aimed at mitigating the risk of eating disorders, and identifying those individuals at risk of disordered eating (including eating disorders and obesity). The research reviewed within this project included five randomized control trials, two literature reviews, eight non-experimental studies, one quasi-experimental study, and one experimental study.

Larson et al. (2016) surveyed 3,072 students in grades nine and twelve in Minnesota public schools. The purpose of this study was to examine if disordered eating behaviors and markers of poor mental health are common among adolescents who are overweight compared to adolescents who are not overweight. Data was obtained from the students via the School Obesity-related Policy Evaluation (ScOPE) cross-sectional

study from the years 1999-2010 (Larson et al., 2016). ScOPE evaluated food and activity policies, practice environments, exam behaviors, and the status of the student's weight. Health education teachers and principals were surveyed using the Minnesota School Health Profile. A survey of the teachers included "risks of unhealthy weight control practices, differences in body size, and recognizing the signs, symptoms, and treatment for eating disorders" (Larson et al., 2016, p. 205). The survey of the principals asked about the presence of snacks and beverages in vending machines, as well as the type of food available in the vending machines (such as candy, salty snacks, cookies, low-fat snacks, and sports drinks). Physical education and intramural sports offerings were also part of the principal's survey. Larson et al. (2016) emphasized the importance of including curriculum within school health education that is related to behaviors of unhealthy weight-control and to relieve concerns of possible inadvertent consequences of obesity-prevention practices and policies.

Sanchez-Carracedo, Neumark-Sztainer, and Lopez-Guimera (2012) discussed an integrated approach to bridge the scope of eating disorders and obesity in adolescents. This approach is salient because both sides of eating and weight-related disorders included shared risk factors. Additionally, Sanchez-Carracedo et al. (2012) pointed out that messaging may be confusing for adolescents. For example, in recent years, due to increased obesity rates, messaging from public health officials and the media often relates to lowering fat intake, partaking in more exercise, and being aware of one's body image. However, simultaneously there is messaging from eating disorder programs stating that body weight is pre-determined and challenging to change, there are no restricted foods, and restrictive diets should be avoided. To integrate the prevention of both eating

disorders and obesity, Sanchez-Carracedo et al. (2012) found that focusing on healthy behavior and healthy change instead of weight is beneficial. Additionally, promoting healthy lifestyles is important, but it is also vital to ensure that the messaging does not result in eating disorders. Preventative initiatives by healthcare providers may modify shared risk factors and protective factors of disordered weight-related behaviors.

Innaccone, D'Olimpio, Cella, and Cotrufo (2016) examined how dysfunctional eating behaviors and psychological variables (low self-esteem, perfectionism, shame, and perceived parental care) intertwined with eating disorder risk factors, which may explain eating psychopathology vulnerability. Within the confines of this study, the Center for Disease Control and Prevention BMI-for-age categories used the assessment of weight status. This study demonstrated a mechanism of action of low self-esteem, which may lead to body shame and eating pathology. Although there are several factors associated with eating disorder risk, body shame emerged as the leading indicator for obese adolescents. Results showed that obese adolescents believed that a fat body is responsible for a sense of ineffectiveness and this feeling led to low self-esteem. Innaccone et al. (2016) studied obese adolescents aged 13 to 19 (mean BMI 29.69) and non-obese adolescents (mean BMI 20.3) comparing the variables mentioned above via specific scales, such as Rosenberg Self Esteem Scale (Rosenberg, 1965) and the Experience of Shame Scale (Qian & Valentine, 2002). The researchers concluded that bodily shame was a significant factor related to eating disorder risk and poor self-esteem was an important factor for the onset of an eating disorder. This study noted that the mechanism of action (low self-esteem leads to bodily shame, which leads to eating pathology) in obese adolescents is responsible for a sense of ineffectiveness. This

research demonstrated that targeting specific weight-related behaviors may provide treatment programs with tools to prevent eating pathology development in adolescents.

Haines and Neumark-Sztainer (2006) proposed the prevention of adolescent obesity, eating disorders, and disordered eating take an integrated method. Identifying risk factors that are common between the aforementioned weight-related disorders is an essential step in establishing interventions that are effective. As shown in Figures 1 and 2, Haines and Neumark-Sztainer (2006) demonstrated the associations between weight-related behaviors in the realm of dieting and obesity.

Figure 1. Relationship of dieting and obesity

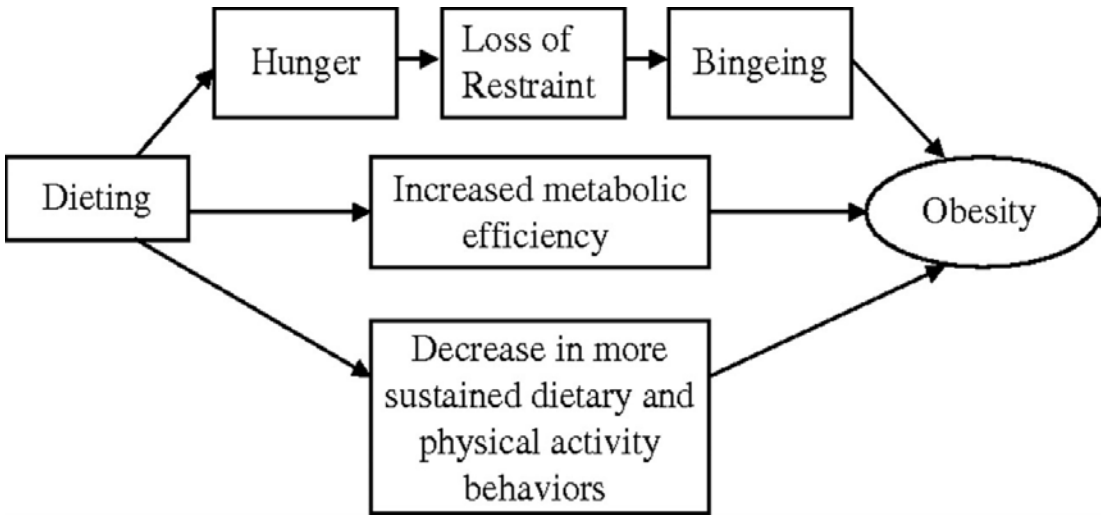

Figure 1. Figure illustration explains how dieting may lead to weight gain. The basis for this model is that cognitive-style eating is acquired through dieting instead of eating in response to physiological cues of hunger and fullness. Adapted from (Neumark-Sztainer, 2006)

Figure 2. Relationship of dieting and eating disorders

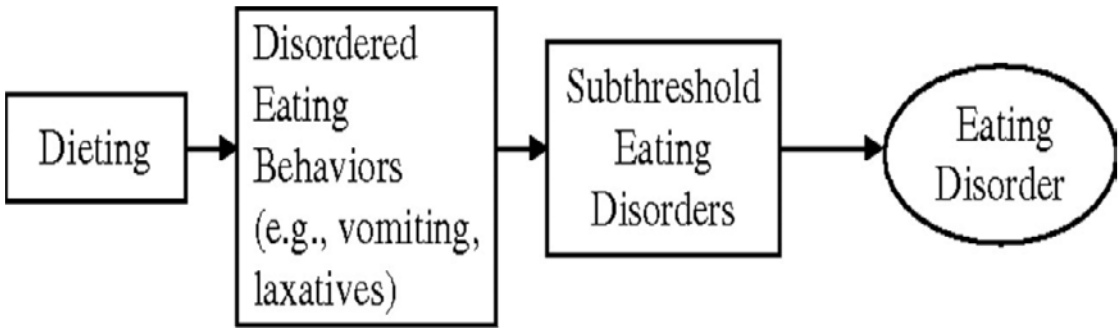

Figure 2. Haines and Neumark-Sztainer, (2006) theorized that the majority of adolescents with eating disorders self-reported that dieting was started before they initiated disordered eating behaviors. The model above demonstrates a prediction of elevated risk of disordered eating behavior and sub-clinical eating disorders leading to the pathology of eating disorders (such as AN or BN). Adapted from Neumark-Sztainer, 2006.

Numerous studies have identified the correlation between dieting and an increase in obesity. The high incidence of harmful effects on psychosocial and physical health, obesity, eating disorders, and unhealthy dieting practices among adolescents are serious problems (Pietiläinen, Saarni, Kaprio, & Rissanen, 2011). The identification of risk factors that are relevant to both conditions may be the key to meaningful prevention interventions. Considering obesity and eating disorders simultaneously in the light of prevention may reduce the risk of inadvertently causing one disorder while trying to prevent another (Haines & Newmark-Sztainer, 2006).

Quick and Byrd-Bredbenner (2012) surveyed 2,449 college students regarding weight control practices using restrictive eating and non-restrictive eating. This project was a cross-sectional survey of young adults aged 18-26 years old. The results of this study indicated that those who restrict eating were more often engaged in binge eating behaviors, had a higher BMI, and had more shape, eating, and weight concerns. Additionally, these young adults engaged in emotional eating and dieted more often. Restrictive behaviors transcribed to more unhealthy eating and inappropriate weight regulation practices. This study may assist healthcare providers to better educate young adults about strategies related to eating practices and weight maintenance practices and to recognize the risk factors associated with disturbed eating behaviors.

Loth, Wall, Larson, and Neumark-Sztainer (2015) performed a longitudinal research study regarding overweight and non-overweight male and female adolescents on disordered eating behaviors and psychosocial well-being. As part of the study, participants were measured for height and weight and answered survey questions. Markers of psychosocial well-being were measured by surveying students about depression, self-esteem, body satisfaction, weight concerns, and weight status. The study was conducted between the years 1999 through 2010 when there was increased attention to obese-related issues within the media. The findings of the study indicated that the messaging of the dangers of disordered eating behaviors need to reach overweight youth. The comorbid nature of obesity, disordered eating, and poor psychosocial health needs attention from healthcare providers; addressing risk factors (dieting, media use, body dissatisfaction, and weight-related teasing) needs to be a part of any prevention program.

Wilksch et al. (2014) conducted a randomized controlled trial with adolescents in Australia of three school-based programs that measured obesity-prevention and eating disorder outcomes: Media Smart, Life Smart, and Helping, Encouraging, Listening, and Protecting Peers (HELPP). A total of 1,316 girls and boys in the seventh and eighth grades were randomly allocated into one of the three previously mentioned programs. Media Smart was the only program to show benefit in both disordered eating and obesity risk factors. Internalization of the messages provided by the media is a presumed risk factor for both obesity and eating disorders. As demonstrated in Figure 3, Haines and Neumark-Sztainer (2006) indicated that television viewing may contribute to obesity via two mechanisms – the minimization of energy expenditure due to reduced physical activities and increased food consumption or as a result of food advertising. Figure 4 exhibits the role media exposure plays on adolescents internalizing a cultural belief of thinness for females and muscular, lean bodies for males. Because the culturally ideal body image is unattainable for most people, body dissatisfaction occurs.

Figure 3. Relationship of media, sedentary lifestyle, and obesity

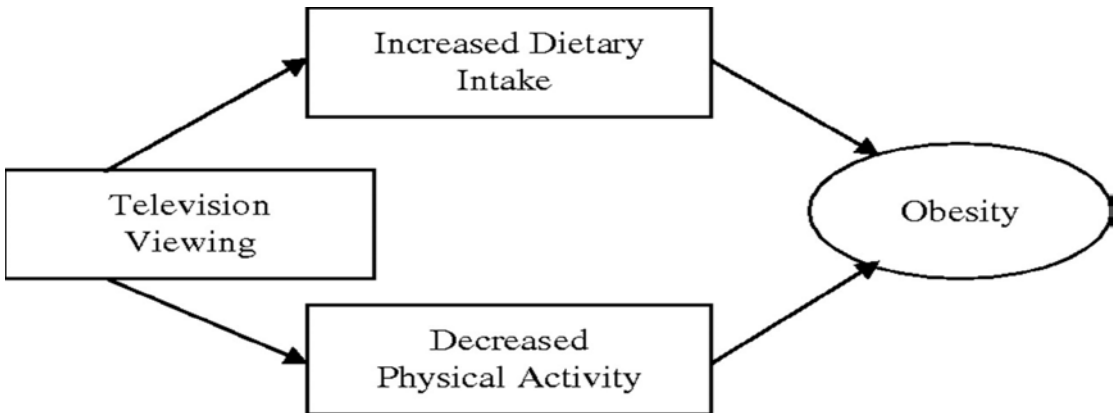

Figure 3. This model accounts for obesity in the light of increased sedentary activity and increased food intake due to media. Adapted from Haines and Neumark-Sztainer, 2006.

Figure 4. Relationship between media and eating disorders

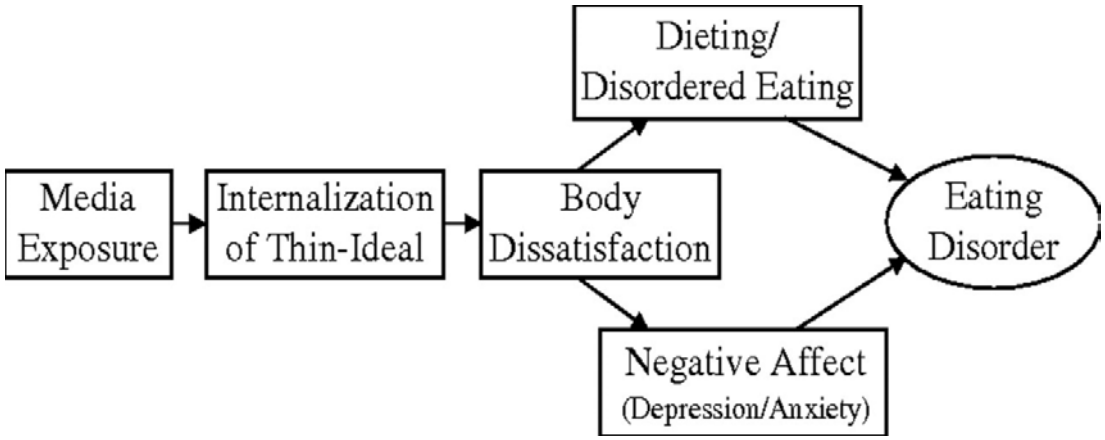

Figure 4. Exposure to the body image ideals via the media may lead to eating disorders. Over the past several years, media has perpetuated the sociocultural theories to conform to cultural ideal shape and size (Morrison, Kalin, & Morrison, 2004). Adapted from Haines and Neumark-Sztainer, 2006.

Haines, Gillman, Rifas-Shiman, Field, and Austin (2011) performed a longitudinal study regarding the association between disordered eating and family dinners. This was a large study with 7,535 females and 5,913 males participating. The results demonstrated that preadolescents and adolescents who ate dinner with family members most or every day of the week were less likely to engage in disordered eating patterns, defined in the study as purging, binge eating, and frequent dieting. The reasons for this decrease in disordered eating behaviors is that shared family meals promote regular meal consumption and enhanced parent/child relationships resulting in increased cohesiveness and communication.

Ranzenhofer et al. (2012) studied the association between binge eating (BE) and health-related quality of life (QOL). One-hundred-fifty-eight adolescents were studied via an interview process using the Eating Disorder Examination version 12, the self-report survey using Impact of Weight on Quality of Life, the Adapted for Use with Adolescents, and the Children's Depression Inventory self-report questionnaire. The association between BE, gender, and weight-related QOL in obese adolescents resulted in poorer QOL in several domains of functioning: health, mobility, and self-esteem. Girls reported poorer QOL than boys. A part of this study included depression symptoms which accounted for the primary reason to engage in binge eating. The results of this research study demonstrated that girls with a BE disorder reported poorer QOL and greater impairments than boys in the areas of daily living, mobility, self-esteem, and social functioning. In the realm of interventions, there is a benefit to the adolescent explicitly focusing on the development of positive interpersonal relationships and supporting adaptive attitudes related to social functioning.

Neumark-Sztainer et al. (2007) utilized Project EAT-I and Project Eat-II (Eating Among Teens-I and II) in a longitudinal study; Project EAT-I spanned from 1998-1999, and then Project Eat-II was completed four years later. The survey results indicated that weight-related problems (overweight, binge eating, and extreme weight-control behaviors) were prevalent among adolescents, suggesting a need for interventions aimed at prevention, early detection, and treatment. Interventions would be most beneficial if they targeted weight-specific variables within socio-environmental, personal, and behavioral fields. These three aforementioned domains are strong predictors of weight-status, binge eating, and extreme weight-control behaviors later in adolescence.

Sim et al. (2013) demonstrated that adolescents who were obese or overweight were often not diligently treated for ED because of their high BMI. Eating Disorders can develop in the context of obesity; these adolescents are difficult to define because they are often overlooked due to being overweight. According to a study conducted by Boutelle, Neumark-Sztainer, Story, and Resnick (2002), overweight adolescents were more likely to engage in unhealthy weight control behaviors, such as diet pill use, vomiting, and laxative use, than their non-overweight peers. ED can present at any weight. Therefore, weight concerns are based on divergence from the growth of a child or adolescent. Looking solely at a percentile will not elicit treatment from most health care professionals (Sim et al. 2013).

Major Findings

Research findings concerning a possible connection between obesity and eating disorder prevention programs resulted in the identification of several recommendations. Via a sampling of the research review by Larson et al. (2016), there was no evidence to assert that obesity prevention programs caused unintended consequences for students with weight-control behavior issues. Sanchez-Carracedo et al. (2012) performed a narrative review that resulted in the recommendation that the fields of obesity and ED share information for the detection of disordered eating at both ends of the spectrum. Community and environmental-based programs with the creation of national and international networks would benefit those patients who carry the risk factors of eating and weight-related problems. Innaccone et al. (2016) demonstrated that body shame had a strong relationship to eating problem vulnerability and presented itself as a mediator in the relationship between low self-esteem and eating disorder risk. Quick and Byrd-

Bredbenner's (2012) research efforts noted that restrictive eating resulted in unhealthy weight reduction practices associated with risk factors affiliated with disturbed eating behaviors. The goal of early detection and intervention is essential for realizing ED symptoms so that disordered behaviors may be yielded as early as possible (Sim et al. 2013).

In consideration of the review of the literature, it has been established that both domestically and internationally, weight-related programs implemented in the school and clinic setting have varying levels of success related to changing risk behaviors associated with disturbed eating patterns. Wilksch et al. (2014) applied several school-based programs, namely Media Smart, Life Smart, and HELPP to adolescents in Australia. Of those listed, the only program to show benefit was Media Smart on both obesity risk factors and disordered eating. In Malaysia, Sharif Ishak, Zainun, Chin, Mohd-Taib, and Mohd-Shariff (2016) utilized Eat Right, Be Positive About Your Body and Live Actively (EPal). The EPal program demonstrated two findings: 1) peer leaders were helpful in educating young adolescents about nutrition, and 2) a healthy lifestyle yielded positive changes in body weight status. Larson et al. (2017) surveyed Minnesota school children, teachers, and principals using School Obesity-related Policy Evaluations (ScOPE). The results of the ScOPE project indicated there were no unintended consequences related to obesity-prevention policies/practices or weight-control behaviors. Additionally, school-based health education plays a vital role in the effort to prevent unhealthy weight-control behaviors. Lebow, Sim, and Kransdorf (2014) employed an Eating Disorder Examination Questionnaire (EDE-Q) at a specialty eating disorder clinic. The questionnaire assisted researchers to define eating disorder symptomology, including

weight, shape, dietary restraint, and eating concerns. The results demonstrated that extreme weight loss related to a restrictive eating disorder is not healthy in the adolescent population even if the adolescent has a history of overweight or obesity. Adolescents who have a history of being obese or being overweight may have a poorer prognosis for recovery since identifying an eating disorder in this group may take longer.

Strengths and Weaknesses of the Research Studies

As detailed above, there were many studies utilized for this research project that have inherent strengths and weaknesses. In accord with determining the strength and weaknesses of studies via the *Johns Hopkins Nursing Evidence-Based Practice: Model and Guidelines* (Dearholt and Dang, 2012), all research studies used in this project adhered to the guidelines and evidence and appraisal tool. Dearholt and Dang (2012) outlined both the tools and the guidelines.

Larson et al. (2016) studied adolescents in the high school setting, grades nine through twelve. The strengths of this research project included a twofold analysis: repeated cross-sectional study and cohort analyses and statewide data that captured a diverse school sampling of weight-related curricula, practices, and policies. Since the study repeated itself after a six-year timeframe, the gathered information allowed for connecting school-level data to measures of weight control behavior used by the students. Because of the survey measures, the researchers were able to examine associations between obesity-prevention policies and practices and student behaviors.

A limitation of this study is that the sampling of students is only from the state of Minnesota. Caution should be used when generalizing the results of this study to all students across the nation, and especially worldwide. Additionally, the overall analysis

included only selected subsamples of students and school personnel. The data collected could potentially be biased due to nonresponse from school personnel and due to student self-reporting their height, weight and weight-control behaviors. It was unclear from the survey results whether or not school personnel explained their school policies and practices aimed at preventing obesity to students. Given the information above regarding the study conducted by Larson et al. (2016), this study is a level III with good quality.

Within the meta-analysis conducted by Sanchez-Carracedo et al. (2012), the researchers determined few professionals may have the background and ability to provide insight into the risk factors of both obesity and ED. This analysis was a level V analysis of high quality due to the extensive nature of its measuring tools and the wide variety of studies examined for this research project. The studies utilized were 12 randomized control trials, a meta-analysis of 163 studies, and systematic reviews of 43 studies.

Iannaccone et al. (2014) identified 111 students who met obesity standards and 111 students who were of normal weight, as defined by specific measures in the study. The strength of this study is that it noted results indicating body shame was a significant factor ($p. < 0.1$) of unhealthy eating behaviors among adolescents. The limitations of this study include the use of a self-report questionnaire and the fact that the students were all from the same high school, located in southern Italy. Because this particular area of Italy was the only region studied, generalizing these results outside of Italy may be ambiguous. Moreover, actual behaviors remain unknown; this was a self-declaring survey. The study was level I with good quality.

Quick and Byrd-Bredbenner (2012) performed a cross-sectional study with a large racially diverse sample; 2,449 young adults aged 18-24 were surveyed via online

technology. A strength of this study is the utilization of valid, reliable instruments such as the Eating Disorder Examination Questionnaire, Binge Eating Disorder Module, Emotional Eating and Disinhibited Eating Scales, and Night Eating Questionnaire. According to Quick and Byrd-Bredbenner (2012), internal consistency scores (measured by Cronbach's α) were determined to be good to excellent reliabilities. A second strength of this study is its contribution to the literature demonstrating that night eating is more common in restrictive eaters. A limitation of this study is that it does not take into account which variables of night eating were causal and which may be the effects of being a restrictive eater. Quick & Byrd-Bredbenner, (2012) concluded future research is needed to define variables that may be predictive of restrictive eating.

Loth, Wall, Larson, and Neumark-Sztainer (2014) used a repeated cross-sectional design to examine how overweight and non-overweight adolescent boys and girls faired regarding disordered eating behaviors and psychosocial wellbeing. Strengths of this study include a diverse population, the inclusion of the measurements of heights and weights, and the fact that the study spanned a period (1999-2010) when there was much media attention to weight related topics. However, the data collected from this study was from one large urban area in Minnesota, so it is difficult to generalize the study findings. This study was a level III with good quality.

A strength of the Ranzenhofer et al. (2012) study is the utilization of a sample of 158 adolescents in a structured interview of a diverse population. There were more girls than boys interviewed; however, the researchers were still able to detect differences between the sexes concerning binge eating. A limitation of the study include the inability to generalize the findings to treatment-seeking youth. This study was of high quality and

was a level III because it utilized interviews and questionnaires to assess the quality of life (QOL). Binge eating was assessed and measured via the Eating Disorder Examination Version (EDE), the Impact of Weight on QOL adapted for adolescents (IWQOL-A), and the Children's Depression Inventory.

Haines et al. (2010) studied a large sample of females (7,535) and males (5,913) regarding the association between family dinners and disordered eating. The strength of this study was that it was a longitudinal study using Growing Up Today Study (GUTS); the nature of the study allowed for the monitoring of changes over time. Because of the vast nature of the study, the authors were able to separately assess male and female associations between family dinners and disordered eating behaviors. A limitation of this study is that participants of this study were children of nursing students and the study sample was ≥ 90% White, so it is difficult to generalize these findings. Additionally, it was unknown how the general family context (family functioning, parent/child communication) may mediate the association between family meals and disordered eating. This study was of good quality and was a level III.

Neumark-Sztainer et al. (2007) studied a large, diverse population. The authors studied 2,516 adolescents with data collected between 1998-1999 and 2003-2004 and data analyzed from 2006-2007. The authors simultaneously studied risk and protective factors for different weight-related outcomes in a population-based sample of adolescents; this is one of the first studies of its kind. A limitation of this study is that the subjects were from one Midwestern state. Additionally, many measures of the predictor variables and weight-related outcomes were brief so that the research subjects would not be over-burdened with surveys. This longitudinal study was a level III of good quality.

Summary

Around the world, researchers have worked hard to seek answers to eating disorders, obesity, and the use of unhealthy weight control behaviors. After an extensive literature search, a significant finding includes the need for healthcare professionals to be acutely aware of eating behaviors within the adolescent age group. Recognizing risk factors for weight-related disorders (obesity and eating disorders) is an essential component in preventing and predicting risky behaviors. Additionally, there are several educational programs/tools to measure eating disorders and weight-related behaviors in the adolescent population. These programs have proven to be beneficial to explore behaviors of preoccupation with body image and dietary restrictions.

Chapter Four: Discussion, Implications, and Conclusion

Discussion

The aim of this literature review is to compare obesity prevention programs and eating disorder prevention programs regarding possible negative effects on adolescents with weight-related disorders. This literature review revealed a considerable amount of research dedicated to eating disorders, disordered eating, and weight-related disorders among adolescents. The literature supports minimal evidence revealing adverse or unintended consequences occurring when obesity prevention programs or weight-related control programs are simultaneously instituted in the school setting. However, there is evidence to support a connection between eating disorder patterns and obesity prevention programs and the need for creation of networks among healthcare providers as well as clear messaging regarding nutritional information. Research by Golden, Schneider, and Wood, (2016) found that some adolescents who have developed an eating disorder were previously not overweight. Still, there is a commonality in the adolescent population that eating disorders may begin because of trying to start a healthy lifestyle. Contrariwise, overweight adolescents may embrace disordered eating behaviors while attempting to decrease weight (Sim et al., 2013). Unhealthy eating behaviors start with a misinterpretation of healthy messaging and food that is perceived as unhealthy or bad is eliminated from a diet.

Nutritional information that is found on food labels is one avenue that needs clear messaging and attention. The United States Department of Agriculture (USDA) has mandated that food labels contain nutritional information on most food sold in the United States. The nutrition facts list daily value percentages based on a 2,000-kal diet;

however, adolescents who are moderately active require approximately 2,200 – 2,800 kcal/day (USDA, 2018). Therefore, adhering to a strict 2,000 kcal/day diet may lead to diminished energy and unintended weight loss. It is important for adolescents to be advised by healthcare practitioners to carefully read nutritional labels and maintain a stable, healthy lifestyle including a combination of nutritious food, rest, physical activity, and attention to one's emotional and mental health (MedlinePlus.gov, 2018).

There are a variety of techniques and tools available to healthcare practitioners that may encourage individuals to participate in treatment. A useful intervention that may assist with adolescent weight-related behaviors is motivational interviewing (MI); this technique avoids weight-related language and promotes improved communication while providing weight-related counseling (Golden et al., 2016). The utilization of MI focuses on communication that is collaborative and goal-oriented while paying particular attention to focus on the language of change. Emphasis is placed on personal motivation for achieving a particular goal. By creating an atmosphere of acceptance and compassion, the adolescent may explore their reasons for the change. The promotion of healthy weight-related behaviors, including eating and activity, are addressed by the healthcare team so that the adolescent and the family are the centers of MI. See Table 2 for the counseling process of MI.

Table 2. The Process of Counseling based on MI.
• Engaging
Establishing a working relationship with the patient
• Focusing
Identifying how change is being discussed in the conversation
• Evoking
Encouraging the patient to explore and discuss the need to change
• Planning for change
Planning for change with the patient once the patient demonstrates readiness to change

Table 2. The above table demonstrates the counseling process of MI. It involves four broad approaches with a collaborative, goal-oriented style of communication between healthcare provider, the family, and the adolescent. Its design emphasizes the language of change, personal motivation and commitment to achieving a specific goal (Miller & Miller, 1991). Adapted from Golden et al., 2016.

Family participation in the treatment of weight-related behaviors has been found to be more effective than when adolescents are the focus of treatment (Shrewsbury, Steinbeck, Torvaldsen, & Baur, 2011). MI focuses less on weight and more on an integrated family-adolescent approach to sustain healthy lifestyle modifications. Parents are encouraged to be healthy role models by actively managing the home food environment by creating accessibility of healthy foods and limiting or eliminating unhealthy food choices (sweetened beverages, food containing refined carbohydrates, and

artificial sweeteners). Family meals, home-prepared meals, and meals with fewer distractions are other methods healthcare providers need to encourage families to embrace when changing to a healthful lifestyle (Golden et al., 2016). Activity levels are also a point of discussion between parents and healthcare providers. In the arena of obesity, increasing physical activity and limiting screen time to less than two hours per day are key concepts for parents to understand for prevention of an inactive lifestyle that may lead to obesity (Golden et al., 2016).

A healthcare network has the potential to identify individuals that carry the risk factors of eating and weight-related problems. Additionally, providers need to impart the parental role of healthy eating with adolescents. Educating and emphasizing parental engagement and role modeling healthy eating patterns in the home environment is a means of supporting healthy weight-related behaviors. Curriculum programs designed for schools would be most beneficial if it included preventative interventions supporting an overall healthy approach to eating and feeding. The effectiveness of an intervention depends significantly on the messaging presented and the audience. In regard to obesity, addressing risk factors, benefits of increased physical activity, and improved dietary intake produced the most notable gains to healthy lifestyles (Haines & Neumark-Sztainer, 2006). When addressing eating disorders, awareness to warning signs (such as secrecy around eating, frequent attempts at eating, and throwing away food), messaging around the sociocultural ideal of thinness, and the personality traits of perfectionism were of great importance (Muhlheim, 2012).

Research also indicated that adolescents may present with more than one disorder and may pass from one problem to another. Behaviors associated with weight related

problems or disorders may include overweight, binge eating, and extreme weight control methods. It is beneficial to look at shared risk factors for the development of weight and eating related disorders. The shared risk factors include body dissatisfaction, weight and body concerns, family issues, peer issues, school related issues (including coach or teacher behaviors), sociocultural norms for ideal body weight, and media messages about eating, body image, and physical activity (see Figures 5 and 6). Broadening the scope of focus to address the full spectrum of weight related problems can guide the development of interventions that simultaneously address unhealthy weight control behaviors. In consideration of the international stage, the results of weight related programs implemented in school and clinical settings have a varying level of success at changing the behavior related to disturbed eating patterns. The nursing theoretical frameworks of Neuman's System Model and Erickson's Psychosocial Developmental Theory may be applied because adolescents face a multitude of stressors which may lead to an unhealthy sense of identity and unhealthy social expectations. Stressors, such as body image dissatisfaction, can be identified as intrapersonal stressors. Additionally, media exposure that negatively impacts an adolescent may be an extrapersonal stressor. Cultural expectations, self-concept, attachment to family, and social identity factor into how an adolescent defines one's self. Unhealthy weight control behaviors of adolescents need to be recognized so that the individual's health may be restored and maintained.

Figure 5. Relationship between body image

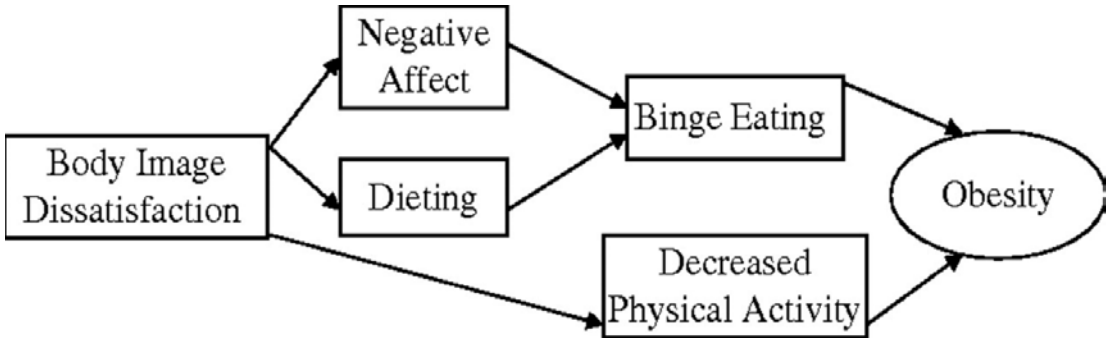

Figure 5. The above figure demonstrates body dissatisfaction and BED. According to Haines and Neumark-Sztainer, (2006) adolescents with body dissatisfaction were 1.5 times more likely to initiate BED. Body image dissatisfaction and BED may be mediated by negative affect (such as anxiety or depression) and dieting which leads to overeating and obesity. Body image dissatisfaction does not necessarily motivate physical activity; instead, it is associated with diminished participation in physical activity (Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006). Adapted from Haines and Neumark-Sztainer, 2006.

Figure 6. Relationship between body image dissatisfaction and eating disorders.

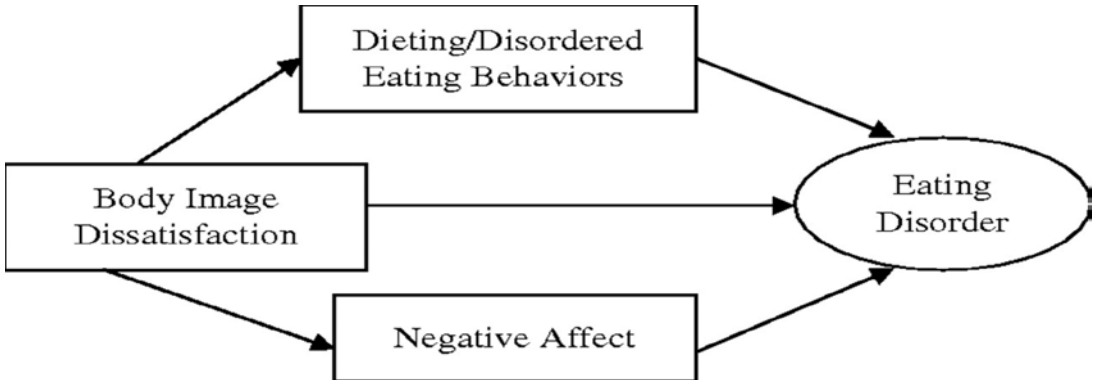

Figure 6. The figure above presents a three-fold hypothesis of why body dissatisfaction may lead to eating disorders: 1) utilization of dieting behaviors is a result of body image dissatisfaction 2) negative affect is a result of body image dissatisfaction with ultimately leads to eating disorders, and 3) body dissatisfaction may directly encourage eating disorders. Adapted from Haines and Neumark-Sztainer, 2006.

Recognizing risk factors for weight-related disorders (obesity and eating disorders) is an essential component to prevent and predict risky behavior. It is clear preventative approaches to obesity and eating disorders can be confusing; the eating disorder field has focused on the social environment and the obesity field has focused on social and physical factors. To integrate the prevention of both eating disorders and obesity, Sanchez-Carracedo et al. (2012) found that focusing on health behavior and health change instead of weight is most beneficial. Body image dissatisfaction starting in the middle and late childhood period may transcend to the adolescent period. The AAP defines middle and late childhood as ages 5-10 years old (Bell, Breland, & Ott, 2013). As children enter the later childhood years, they may become increasingly aware of body image and appearance. Thus, a dissatisfied body image may lead to eating less and attempting to lose weight at a time of increased growth. Early detection of unhealthy eating patterns or behaviors is essential for prevention and thwarting habits leading to adverse weight related behaviors.

Nursing Implications

Throughout the various bodies of research, there has been an identification of relationships between body image, body shame, and low self-esteem leading to behaviors that increase vulnerabilities to eating problems. Body shame and low self-esteem are chronic psychiatric conditions associated with significant complications that are both medical and psychological/psychiatric and present unique challenges to nursing care. Based on a comprehensive nursing assessment, effective nursing care includes medical and treatment history, mental status, and disordered weight related symptoms (Wolfe & Gimby, 2003). As a nurse, it is essential to explore comorbid conditions that weight

related disorders bear because of the increased risk for medical instability. Assessing previous illnesses (medical history), medical complications secondary to weight control behaviors, and other medical and psychiatric conditions are essential components to the nursing process (Wolfe & Gimby, 2003).

Excess weight or obesity is a threat to health with risks that include Metabolic Syndrome, osteoarthritis, cardiovascular disease, respiratory compromise, intra-abdominal pressure, and skin conditions (Camden, 2009). Eating disorders carry medical risks including bradycardia, osteoporosis, muscle wasting, renal failure, electrolyte imbalances causing irregular heart rates, dehydration, hypertension, hair loss, and dry skin and hair (NEDA, 2016). Therefore, due to the medical risks of unhealthy eating behaviors, several clinical signs raise suspicion of disturbed eating. Aside from physical signs and symptoms, such as vital signs or laboratory changes, a patient may camouflage their symptoms. That is, talking about eating when upset or stressed, using food for calming purposes, or quit eating to feel more in control of their environment. Nurses need to recognize when a patient is continually thinking about food (to eat or not eat), weight, diet, exercise, or body image. Additionally, the influence of friends and family, impact of the media, family pressures, and a disturbed body image are signs and symptoms that a nurse needs to recognize (Wolfe & Gimby, 2003). Increased knowledge and skill around unhealthy eating behaviors and seeking interdisciplinary collaboration to meet nutritional needs, psychosocial-health needs, and physical needs are paramount for the nursing profession.

A nursing goal of early detection and intervention is essential for realizing weight related symptoms so that disordered weight control behaviors cease as early as possible.

Formulating an integrated approach that addresses the range of weight related conditions are needed for effective prevention interventions (Haines & Neumark-Sztainer, 2006). Risk factors for weight related disorders need recognition from an interprofessional team so that there is use of effective weight management strategies. See Figure 7 for a scheme of the complexity of unhealthy eating patterns and how the common risk factors may flow into disturbed eating patterns.

Figure 7. Unhealthy eating concerns.

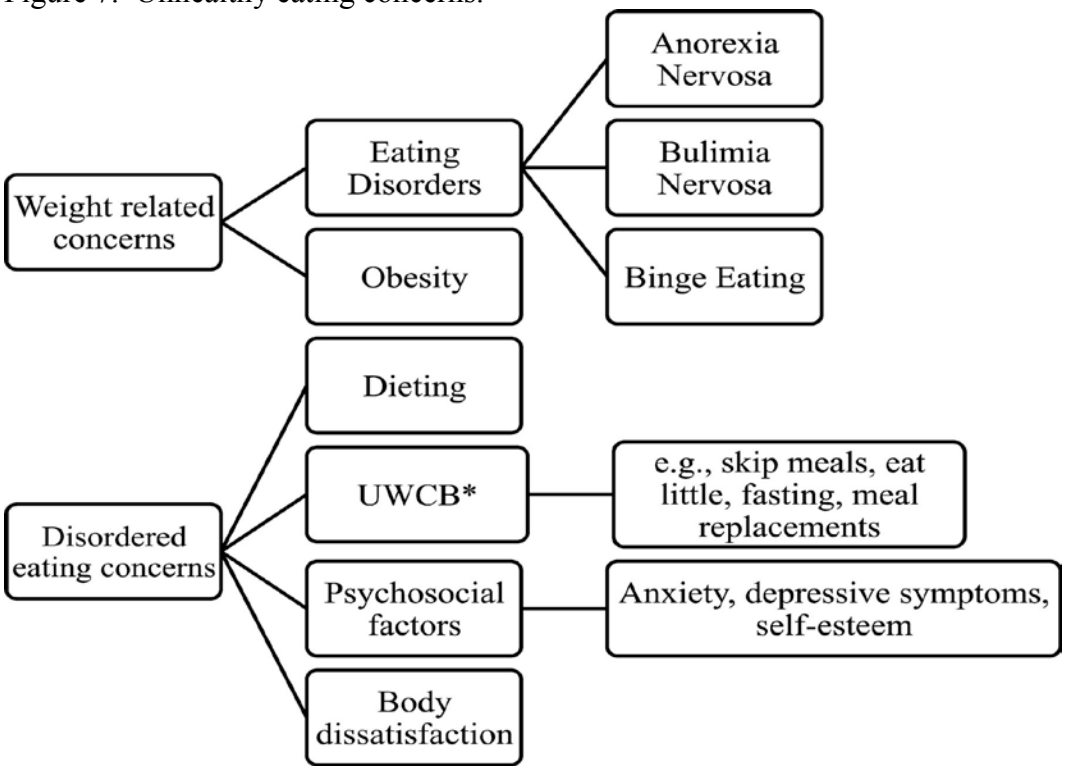

Figure 7. The above figure is a schematic of weight related concerns, disordered eating, and outcomes. These shared commonalties co-occur in the same individual; therefore, healthy eating programs need to promote self-acceptance at any weight. Adapted from Leme et al., 2017.
*UWCB, Unhealthy Weight Control Behaviors.

Clients that need care due to weight related behaviors may be at home, in primary or secondary care environments, inpatient hospital, or outpatient clinic. It is imperative to observe nutritional status since disordered eating may be life threatening; maintaining optimal nutrition and electrolyte balance is the primary focus for nursing care. Observing nutritional status, elimination pattern, activity level, and providing psychological care are all focuses for nurses to provide optimal care.

There is a recognized public health burden of unhealthy eating patterns. The National Eating Disorders Coalition (NEDA) and other partners have worked to gain congressional support to implement training for healthcare professionals and school personnel for earlier identification and intervention when precursory symptoms arise. In 2018, Congress passed the Consolidated Appropriations Act of 2018. Within the act is language to integrate the Education and Training on Eating Disorders for healthcare professionals (Eating Disorders Coalition, 2018). Evidenced based training for healthcare professionals to screen, assess, intervene, and refer patients to specialized treatment has been recognized as an integral component for healthcare providers to prioritize eating disorder prevention, intervention, and treatment (Eating Disorders Coalition, 2018). Nursing leadership involvement in health policy regarding weight-related conditions has gained momentum worldwide. For example, Israel, Spain, and Australia have legal bans on the use of extremely thin fashion models for advertising purposes (Puhl, Neumark-Sztainer, Austin, Luedicke, & King, 2014). These bans came to fruition because of the collaborative work of nurses, psychiatrists, social workers, and physicians. In the United States, nursing leadership has played an integral role within in

the collaborative work of Healthy People 2020 and the Eating Disorders Coalition to establish and support healthy weight related guidelines (Healthypeople.gov, 2018). In addition to the United States Congress passing the Consolidated Appropriations Act of 2018, in prior years several bills and language have been added to impact existing legislation regarding weight related conditions. For example, in 2003 eating disorders language was added to the Improved Nutrition and Physical Activity Act (IMPACT Act), and in 2011 the Eating Disorders Awareness, Prevention, and Education Act was strengthened with the addition of language to include research into eating disorders (Eating Disorders Coalition, 2018).

Another aspect for intervention of weight related conditions is the potential contribution of school nurses and public health nurses. Having the knowledge, skills, and attitude to learn about the complexities of unhealthy eating patterns is an initial step for recognizing nonacademic concerns about an adolescent. Using knowledge of growth and development, normative adolescent behaviors, screening, health histories, and conferences with school personnel and parents, school nurses are in a unique position to detect and prevent unhealthy weight related behaviors (Connolly, & Corbett-Dick, 1990). Since the school nurse delivers health services, assuming the role of case manager for weight related health conditions is a fitting responsibility. When students come to the school nurse's attention, each student should be evaluated physically and a health history obtained before taking further measures. Creating a pathway for support, prevention, and treatment with an interdisciplinary team at school (school nurse, psychologist, guidance counselor, and administration) may provide early detection and thus early intervention (NEDA, 2018). Teaching students about eating disorders and healthy eating across the

spectrum have great value because unhealthy eating behaviors may have a profound impact on an adolescent's ability to learn and thrive.

Conclusion

The findings from this literature review indicate that adolescents may present with more than one disorder and may pass from one problem to another over time. Additionally, shared risk factors may be relevant for the development of weight and eating related disorders. These factors include media use, body dissatisfaction, weight and body concerns, family issues, peer issues, school related issues (including coach or teacher behaviors), sociocultural norms for ideal body weight, and media messages about eating, body image, and physical activity. It is clear that preventative approaches to obesity and eating disorders can be confusing, therefore, it may be beneficial to develop interventions to prevent a spectrum of eating and weight related programs concurrently. Interprofessional healthcare teams need to address weight related problems in a manner where interventions target multiple weight related outcomes. The weight related outcomes need to support lifestyle choices based on healthful eating and physical activity behaviors. A coordinated approach addressing the span of weight related eating disorders and identifying risk factors is an essential part of developing effective prevention interventions.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Larson, N., Davey, C. S., Caspi, C. E., Kubik, M. Y., & Nanney, M. S. (2016; 2017;). School-based obesity-prevention policies and practices and weight-control behaviors among adolescents. *Journal of the Academy of Nutrition and Dietetics, 117*(2), 204. doi:10.1016/j.jand.2016.09.030. Level: III Quality: Good.	Describe curriculum that addresses prevention of unhealthy weight-related behaviors. Describe association between weight control behaviors and health curriculum. Assess obesity prevention via science-based school policies and practices related to prevention of obesity and weight control.	Setting: Secondary public school MN Sample: grades 9-12, n=42 and n=141	Survey cross-sectional associations longitudinal associations	MN school health profiles teacher and principal, school nutrition and physical activity policy and practice and student survey.	Results: no connection between health education curricula and prevalence of students with healthy and unhealthy weight-control behaviors. Conclusion Consider impact of gender in future studies.	Enact policies that support positive educational messages Related unhealthy weight-control behavior and eating disorders. Follow up research needed.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Sharif Ishak, Sharifah Intan Zainun, Chin, Y. S., Mohd. Taib, M. N., & Mohd. Shariff, Z. (2016). School-based intervention to prevent overweight and disordered eating in secondary school Malaysian adolescents: A study protocol. *BMC Public Health, 16*(1) doi:10.1186/s12889-016-3773-7 Level: II Quality: High	Investigate whether the EPaL (Eat Right, Be Positive About your body and Live Actively), will promote healthy lifestyle in preventing overweight and disordered eating	Sample: Malaysian girls age 13-14. N=72 Setting: two secondary schools in Malaysia.	Quasi-experimental design. Intervention group and control group. 16 week randomized intervention program. Assessment occurred at 3 points, baseline, post intervention (at final session) and follow up three months after completing.	Socio-demographic characteristics, anthropometric measurements, eating attitudes test, body dissatisfaction subscale. Body importance subscale. Body image and body change inventory. HRQOL. Rosenberg self-esteem scale. Pubertal development scale. 2 questionnaires for eating behaviors.	Results: Peer education leadership strategy gives a sense of control and empowerment of social usefulness. The quality of life improved after implementation of EPaL. Conclusion: EPaL will effect positive change in weight status and promotion of a healthy lifestyle.	In Malaysian adolescents: 1) peer leaders were helpful to educate young adolescents about nutrition, and 2) a healthy lifestyle and positive changes in body weight status were noted at the conclusion of the program.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Wilksch, S. M., Paxton, S. J., Byrne, S. M., Austin, S. B., McLean, S. A., Thompson, K. M., Wade, T. D. (2015). Prevention across the spectrum: A randomized controlled trial of three programs to reduce risk factors for both eating disorders and obesity. *Psychological Medicine, 45*(9), 1811-1823. doi:http://dx.doi.org.ezproxy.bethel.edu/10.1017/S0033291714002891X Level: I Quality: Good	Investigate combined approach to eating disorder and obesity prevention with adolescents in school settings, due to the overlap in risk factors for both.	Sample: 1316 grade 7 and 8 girls and boys (mean age = 13.21 years) n=840 girls and n=476 boys Setting: three Australian states.	A randomized controlled trial of three school-based programs and a no-intervention control group. Media Smart; Helping, Encouraging, Listening and Protecting Peers (HELPP) initiative; or control (normal school class).	Weight concerns and BMI questionnaire for height, weight and blood pressure.	Results: the only program to show benefit was Media Smart on both obesity risk factors and disordered eating. Conclusion: Media Smart was the only program to show benefit on both disordered eating and obesity risk factors.	Media Smart was the choice for school based programming regarding obesity risk factors and disordered eating.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Iannaccone, M., D'Olimpio, F., Cella, S., & Cotrufo, P. (2016). Self-esteem, body shame and eating disorder risk in obese and normal weight adolescents: A mediation model. *Eating Behaviors, 21*, 80-83. doi:10.1016/j.eatbeh.2015.12.010 Level: I Quality: Good	Examine relationship between eating disorder risk factors and eating psychopathology vulnerability. Examine association between eating disorders in obese and normal weight adolescents dysfunctional eating behaviors and psychological variables.	111 high school students (68 males; age range 13–19 years and 43 females) classified as obese and 111 age-, sex- and social status-homogeneous normal weight controls. Setting: The high school was in Southern Italy	CDC prevention BMI-for-age categories used for weight status. For measures: Demographic data, parental bonding (parental bonding instrument), self-esteem (Rosenberg Self Esteem Scale) shame (experience of shame scale), perfectionism (multidimensional Perfectionism Scale) eating disturbance, (eating disturbance risk composite) BMI (body mass index) (height and weight)	Self-report questionnaire; population-based study. All students that participated needed to be in the classroom at the time of the questionnaire.	Results: Relationship between body shame and eating problems and presented itself as a arbitrator in the relationship between low self-esteem and eating disorder risk. Conclusion: Body shame has a strong relationship to eating disorders	Specific eating disorders may be targeted for preventative and treatment programs with attention to youth. Treatment should include dieting and physical activity. This may reduce subjective feelings of ineffectiveness and shame.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Tanofsky-Kraff, M., Shomaker, L. B., Wilfley, D. E., Young, J. F., Sbrocco, T., Stephens, M., . . . Yanovski, J. A. (2014). Targeted prevention of excess weight gain and eating disorders in high-risk adolescent girls: A randomized controlled trial. *The American Journal of Clinical Nutrition, 100*(4), 1010-1018. doi:10.3945/ajcn.114.092536 Level: I Quality high	To examine if reducing weight gain and increased disordered eating can be treated with an interpersonal psychotherapy prevention program.	September 2008 and January 2013 113 adolescent (12–17-year old) girls that were deemed high risk for obesity and eating disorder. This was determined because of BMI. Setting: University based laboratory and a federal research hospital.	RCT The two groups consisted of either an interpersonal psychotherapy group or health – education group program for 12 weeks. Follow up was at 3 months and 12 months.	BMI was determined by dual-energy X-ray absorptiometry (DXA) with a Hologic QDR-4500A or Discovery (Hologic) instrument. Two groups were Interpersonal psychotherapy (IPT) or health educations (HE). HE was based on the HEY-Durham manual for high-school students. IPT was adapted from IPT-Adolescent Skills Training for the prevention of depression	IPT decreased binge eating greater than the control group of health education group.	Intervention of IPT may impact adolescent girls that have above average BMI. Further study is needed to find out if IPT is more effective than a non-intervention control group. If an adolescent girl is at risk for adult obesity, preventative approaches may be appropriate.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Sánchez-Carracedo, D., Neumark-Sztainer, D., & López-Guimerà, G. (2012). Integrated prevention of obesity and eating disorders: Barriers, developments and opportunities. *Public Health Nutrition, 15*(12), 1-15. doi:10.1017/S1368980012000705 Level V Quality high	To examine health consequences exist for both obesity and eating disorders (ED), and the approach to treating both have been separate; examine if co-occurrence between these problems exists	Meta-analysis focusing on eating disorders and obesity; the studies that were reviewed child, adolescent and adult populations.	Meta-analysis	Obesity: Cochrane review, Britain's National Institute of Health and Clinical Excellence. Meta-analysis of effects of weight related outcomes of childhood obesity via school-based programs Eating disorders: Cochrane review	Risk factors of ED and obesity exist between these two eating-related conditions. Few professionals have backgrounds in both areas so taking into consideration both issues is important. It is more important to focus on healthy behaviors than on weight.	Blending knowledge of the two areas (eating disorders and obesity) will enhance the work of prevention in these areas.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Reilly, J., & Kelly, J. (2011; 2010). Long-term impact of overweight and obesity in childhood and adolescence on morbidity and premature mortality in adulthood: Systematic review. *International Journal of Obesity, 35*(7), 891-898. doi:10.1038/ijo.2010.222 Level V Quality Good	To examine the long-term effect of obesity during childhood and if there is mortality in adulthood.	Literature search conducted using key words overweight, child BMI, and morbidity. 5 studies associated with overweight/obesity and premature mortality. Other studies demonstrated connections with adolescent obesity and adult morbidity.	Data base literature search Meta-analysis	Studies included only obese adolescents that could link premature mortality in adulthood. Mortality words included heart, stroke, cancer, cardiovascular and hypertension.	Five studies showed premature mortality associated with obese adolescents in adult life. Nine studies showed strong increases of asthma, polycystic ovary syndrome symptoms and early disability pensions.	There is evidence of adverse health consequences due to childhood/adolescence obesity.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Quick, V. M., & Byrd-Bredbenner, C. (2012). Weight regulation practices of young adults. predictors of restrictive eating. *Appetite, 59*(2), 425-430. doi:10.1016/j.appet.2012.06.004 Level: III Quality: high	To examine the prevalence of restrictive eating in young adults, compare eating behaviors of restrictive and non-restrictive eaters, and predict restrictive eaters.	56% white, 63% female) sample of young adults (*n* = 2449) College students mean age 19.68 years.	Online survey. Cross-sectional survey of young adults, aged 18–26 years. Data were collected between September 2009 and June 2010.	Online survey; Eating Disorder Examination-Questionnaire, Emotional and Disinhibited Eating from the Three-Factor Eating Questionnaire, and Night Eating from the Night Eating Questionnaire and demographics	Race was not a determinant for restrictive eating for females. Non-white males were more likely to be restrictive eaters than white males. Higher BMI's (body mass index) were found in restrictive eaters for both male and female. Non-restrictive eaters were less likely to diet than restrictive eaters.	Health care providers may better serve young adults regarding restrictive eating patterns, weight loss and weight maintenance strategies by recognizing risk factors such as disordered eating, disturbed eating patterns before they escalate to eating disorders. This may be done by providing education and strategies to patients. Additionally, health care providers need to readily recognize risk factors associated with weight-related behaviors.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Loth, K., Wall, M., Larson, N., & Neumark-Sztainer, D. (2015). Disordered eating and psychological well-being in overweight and nonoverweight adolescents: Secular trends from 1999 to 2010. *International Journal Of Eating Disorders*, *48*(3), 323-327. doi:10.1002/eat.22382 Quality III Level-good	To evaluate if disordered eating behaviors and markers of poor psychosocial health are prevalent among adolescents that are overweight compared with nonoverweight peers	Sample: 3072 public school students ages 14-18 (in 1999) and 2793 public school students mean age 14 (in 2010) Setting: public high school	Repeated cross-sectional design. Results of a long term study spanning the years of 1999 and 2010.	Expert review, qualitative input from adolescents, pilot testing test-retest	From the years 1999-2010 disordered eating behaviors and psychosocial well being markers among overweight students remained steady. However, nonoverweight girls disordered eating improved. Nonoverweight boys prevalence of unhealthy weight measures decreased, and depression scores decreased.	All messages to high school students regarding the dangers disordered eating are getting to overweight youth. Prevention programs for obese youth need to include shared risk factors (dieting and media), bullying weight-related teasing and body dissatisfaction.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Haines, J., Gillman, M., Rifas-Shiman, S., Field, A., & Austin, S. (2010). Family dinner and disordered eating behaviors in a large cohort of adolescents. *Eating Disorders*, *18*(1), 10-24. doi:10.1080/10640260903439516 Quality good Level III	Discover associations between family dinners and disordered eating behaviors.	7535 females and 5913 males, 9 to 14 years old Adolescents throughout the United States; these adolescents were children of nursing students; greater than 90% adolescents where white.	Growing Up Today Study (GUTS) longitudinal study questionnaire	1. Family dinner questions 2. Disordered eating questions 3. Dieting questions 4. McKnight Risk Factor Survey assessed weight concerns 5. Importance of thinness to parents questions 6. Parental weight teasing 7. Maternal dieting 8. BMI	It was less likely females who ate dinner with members of their family most days or every day of the week would start purging behaviors, binge eating, and frequent dieting.	Family dinners may protect against DE because there is encouragement, regular meal consumption and enhance quality of parent/child relationship. Further studies need to be done to look at why eating together may protects against DE. Health care professionals should encourage families to eat together as a means for prevention of DE among adolescents.

Citation/Level	Purpose of	Sample/Setting	Design	Results	Authors'

& Quality	Study		Methodology	Instruments		Recommendations
Ranzenhofer, L. M., Columbo, K. M., Tanofsky-Kraff, M., Shomaker, L. B., Cassidy, O., Matheson, B. E., . . . Yanovski, J. A. (2012). Binge eating and weight-related quality of life in obese adolescents. *Nutrients, 4*(3), 167-180. doi:10.3390/nu4030167 Quality high Level I	Discover the connection between binge eating (BE) and quality of life (QOL) in adolescents prior to weight loss.	13-16 year old obese adolescents 157 adolescents Within a 60 mile radius of Bethesda, MD.	Interviews Self-report instrument Self-report questionnaire for symptoms of depression.	Interview to assess BE Questionnaire to assess quality of life Binge eating was assessed by Eating Disorder Examination Version (EDE) Impact of Weight on QOL adapted for adolescents (IWQOL-A) Children's Depression Inventory	BE is impairing among obese, treatment-seeking girls, but less impairing among boys. Girls reported greatest impairment in ADL's, mobility, self-esteem, social/interpersonal functioning and QOL.	Mobility and social functioning are greatly impaired for obese, treatment seeking youth. Interventions to improve QOL include develop strategies for enhancing mobility and social functions. Specific focus on developing positive relationships and adopting positive attitudes related to social functioning.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Neumark-Sztainer, D. R., Wall, M. M., Haines, J. I., Story, M. T., Sherwood, N. E., & van den Berg, Patricia A. (2007). Shared risk and protective factors for overweight and disordered eating in adolescents. *American Journal of Preventive Medicine, 33*(5), 359-369.e3. doi:10.1016/j.amepre.2007.07.031 Quality-good Level III	Examine if there is a need to develop interventions that will simultaneously prevent weight related problems, such as obesity, eating disorders and disordered eating.	Sample: 2516 adolescents Data collected at two times, 1998-1999 and 2003-2004 and data was analyzed in 2006-2007. Setting: Middle school and high school students.	Longitudinal study. Started with EAT I (Eating Among Teens-I) and finished with EAT II. In class surveys for EAT-I and then mailed Surveys for EAT II	Study included socioevniron-mental, personal and behavioral factors relevant to dietary intake, weight-related outcomes. Study included: Focus group of adolescent', Theoretic framework Review of existing instruments, Review by experts.	Obesity prevention and treatment interventions are needed to broaden the weight issue focus of adolescents.	Interventions need to be aimed at prevention, early identification and treatment of weight-related problems. Further study is needed to examine if reducing weight-related social pressure, concerns regarding weight (personal), and control of weight by unhealthy means may contribute to decrease in obesity in youth.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Haines, J., & Neumark-Sztainer, D. (2006). Prevention of obesity and eating disorders: A consideration of shared risk factors. *Health Education Research, 21*(6), 770-782. Quality High Level V	To identify risk factors that may be shared between adolescents that are obese and potentially lead to an eating disorder	Literature review of articles	Literature review	Authors looked at studies specifically interested in dieting, dieting and obesity, dieting and eating disorders, media, media and obesity, media and eating disorders, body dissatisfaction, And the association between body dissatisfaction, binge eating, physical activity, and eating disorders. Association between weight-related teasing, teasing and eating disorders.	Preliminary evidence shows dieting, media use, body image dissatisfaction, and weight-related teasing may trigger the development of weight-related disorders.	Further research needs to be done to address preventing a wide spectrum of weight-related disorders.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		
Lebow, Sim, & Kransdorf. (2015). Prevalence of a history of overweight and obesity in adolescents with restrictive eating disorders. *Journal of Adolescent Health, 56*(1), 19-24. Level III Quality good	Identify the relationship between adolescents that are overweight and those with eating disorders using dietary restriction	9-22 year olds July 2007 through July 2013. 248 adolescents	Retrospective cohort study.	Eating disorder examination questionnaire (EDE-Q)	Overweight or obesity represents a large portion of treatment seeking adolescents. Restrictive eating disorders and restrictive eating habits are unhealthy.	There needs to be a recognition that the nationwide push to reduce obesity and overweight may lead to eating disorders. Medical providers need to be vigilant of developmental growth patterns and recognize if eating patterns change.

Citation/Level & Quality	Purpose of Study	Sample/Setting	Design		Results	Authors' Recommendations
			Methodology	Instruments		

Croll, Neumark-Sztainer, Story, & Ireland. (2002). Prevalence and risk and protective factors related to disordered eating behaviors among adolescents: Relationship to gender and ethnicity. *Journal of Adolescent Health*, 31(2), 166-175. Level I Quality high	Examination of adolescents with disordered eating behaviors	81,247 9th and 12-graders	1998 MN student survey, self-report, including questions about disordered eating behaviors and various psychosocial characteristics.	Minnesota Student Survey is designed to focus on factors of high-risk behaviors and factors possibly associated with high-risk behaviors	56% of 9th grade females 28% of 9th grade males reported disordered eating patterns. 57% of 12th-grade females and 31% of males reported disordered eating patterns.	Health professionals need to be aware of the subclinical disordered eating behaviors, and screen appropriately and provide resources and referral.

Citation/Level & Quality	**Purpose of Study**	**Sample/Setting**	**Design**		**Results**	**Authors' Recommendations**
			Methodology	**Instruments**		

Leme,Thompson, Lenz Dunker, Nicklas, Tucunduva-Philippi, S., Lopez, . . . Baranowski. (2018). Obesity and eating disorders in integrative prevention programs for adolescents: Protocol for a systematic review and meta-analysis. *BMJ Open, 8*(4), E020381. Level: V Quality: good	Examination of integration of obesity and eating disorder prevention procedures vs. a singular approach.	Adolescents 10– 19 years old; boys and girls.	Literature review of quasi-randomized controlled trials and randomized controlled trial. Meta-analysis	Literature review	Results: combining obesity and eating disorder prevention procedures is better than single approach interventions. Conclusion: Mixed approaches may positively impact weight-related outcomes.	In the realm of obesity, eating disorders; there are common risk factors so instituting a common method by practitioners to address these concerns would benefit patients.

Citation/Level & Quality	**Purpose of Study**	**Sample/Setting**	**Design**		**Results**	**Authors' Recommendations**
			Methodology	**Instruments**		

Sim, L., Lebow, J, & Billing, M (2013). Eating disorders in adolescents with a history of obesity. *Pediatrics, 132*(4). Doi: 10.1542/peds.2012-3940 Level V Quality: High	To examine if obese adolescents are at risk for developing an ED	3 case studies in an eating disorder clinic	Case Report	Case Report	ED symptoms of children and adolescents' were identified and intervention starts before disease progression	Overweight or obese youth with can present with ED concerns. Deviations from a child's growth pattern and not simply the percentile should be addressed.

Appendix A: Growth Charts for Boys and Girls, Age 2-20 Years Old

See Figure 8 for boy's stature-for-age, height, and weight-for-age percentiles. See Figure 9 for girl's stature-for-age, height, and weight-for-age percentiles. A growth chart illustrates the distribution of selected body measurements (weight, height) via a series of percentile curves to determine the child is growing appropriately.

Figure 8. Growth chart. Boy's stature-for-age, height, and weight-for-age percentiles.

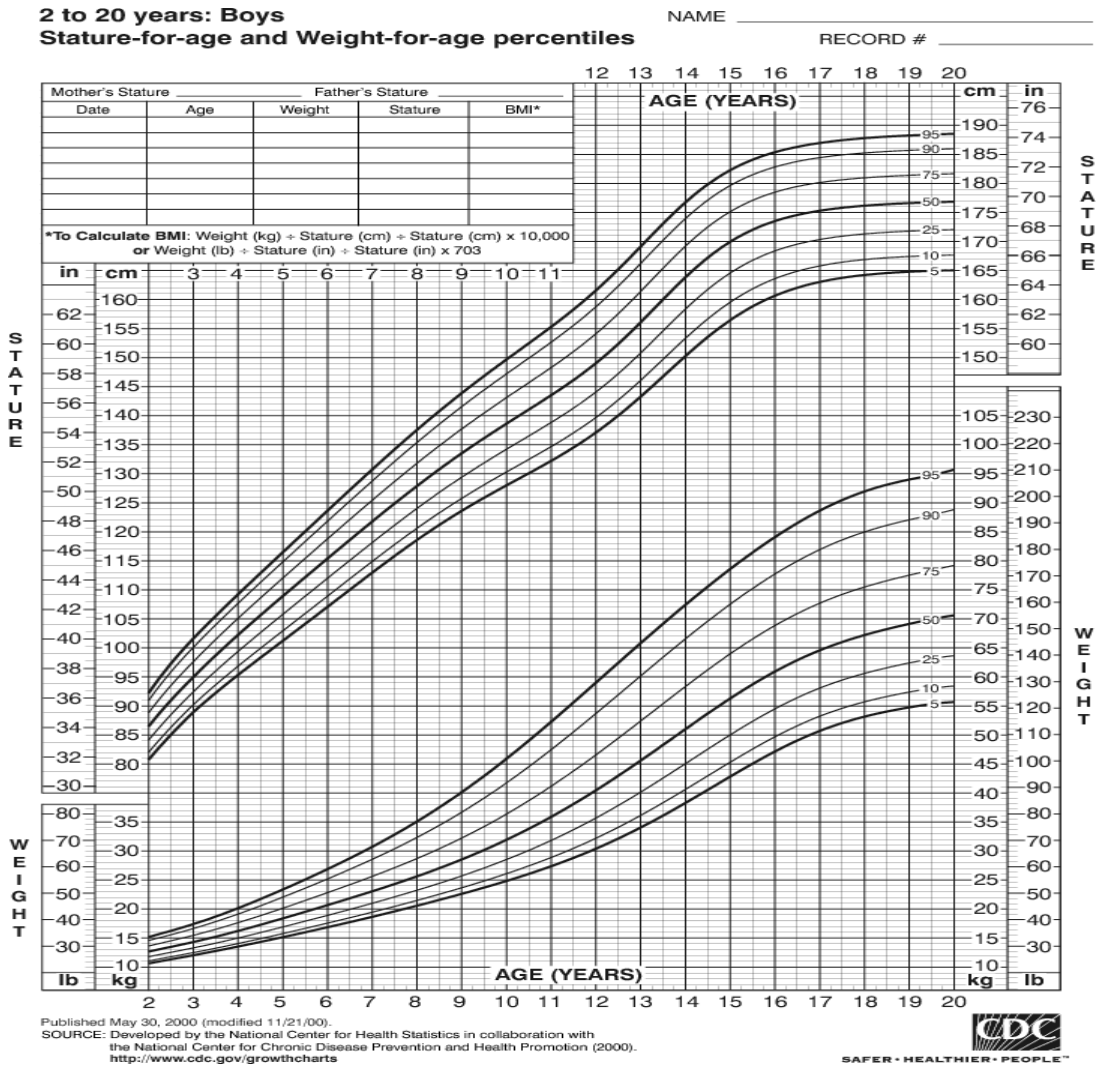

Figure *8.* The chart above demonstrates the clinical patterns growth (height and weight) for boys age 2-20 years (CSC, 2000). *Adapted from CDC (2000).*

Figure 9. Growth chart. Girl's stature-for-age, height, and weight-for-age percentiles.

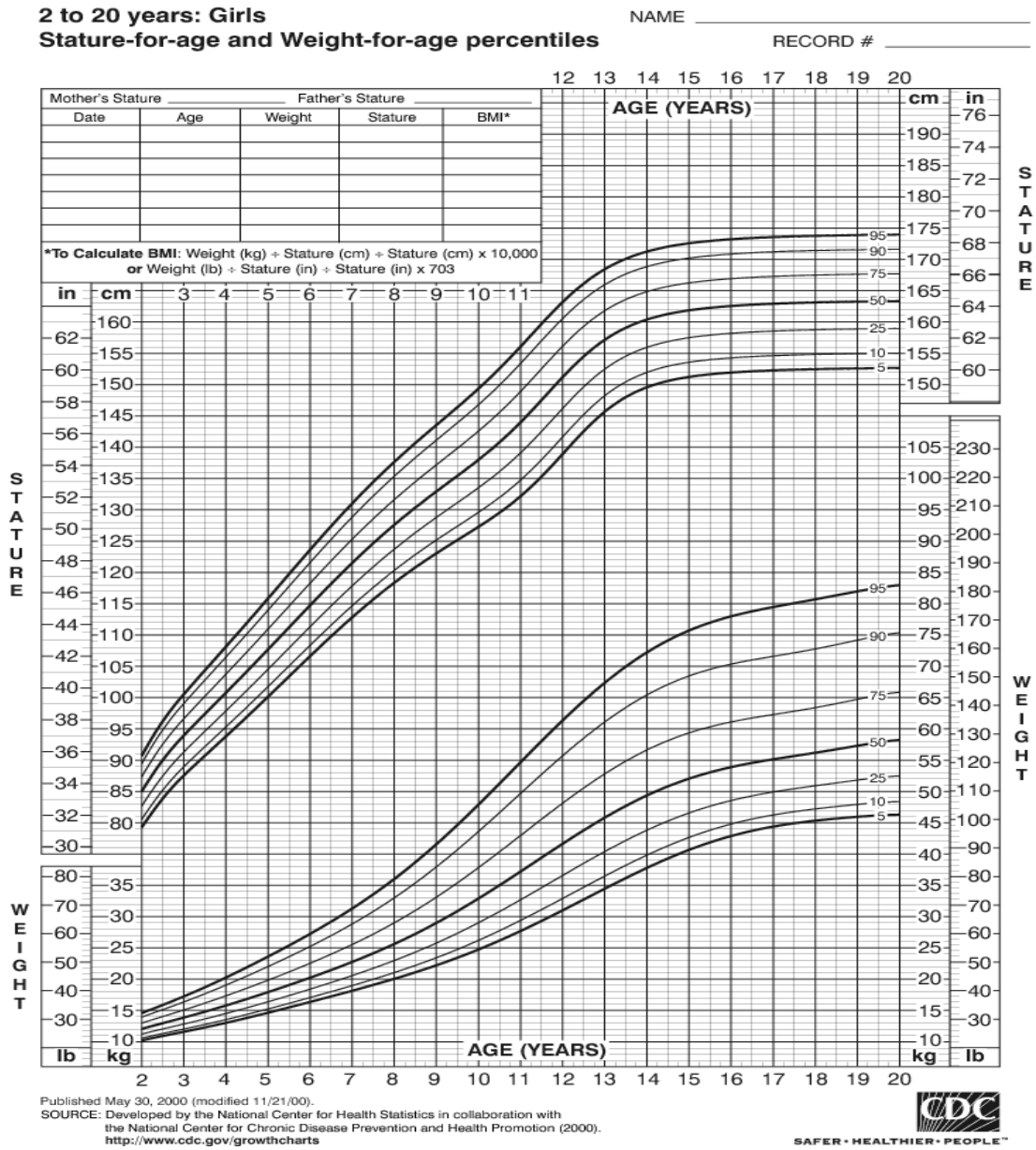

Figure *9.* The chart above demonstrates the clinical patterns growth (height and weight) for boys age 2-20 years (CSC, 2000). *Adapted from CDC (2000).*

Appendix B: BMI for Age Percentile Charts

See Figure 10 for boys BMI for age percentile chart. See Figure 11 for girls BMI for age percentile chart. See Figure 12 for an example of a BMI-for-age percentile growth chart of a 10-year-old-boy that displays the percentile for obese, overweight, normal, and underweight. BMI indicates the level of body fat based on height, weight, and age and may be expressed as a percentile or it may be calculated. The BMI percentile chart expresses a child's BMI relative to other children in the United States.

Figure 10. Boys BMI for age percentile chart

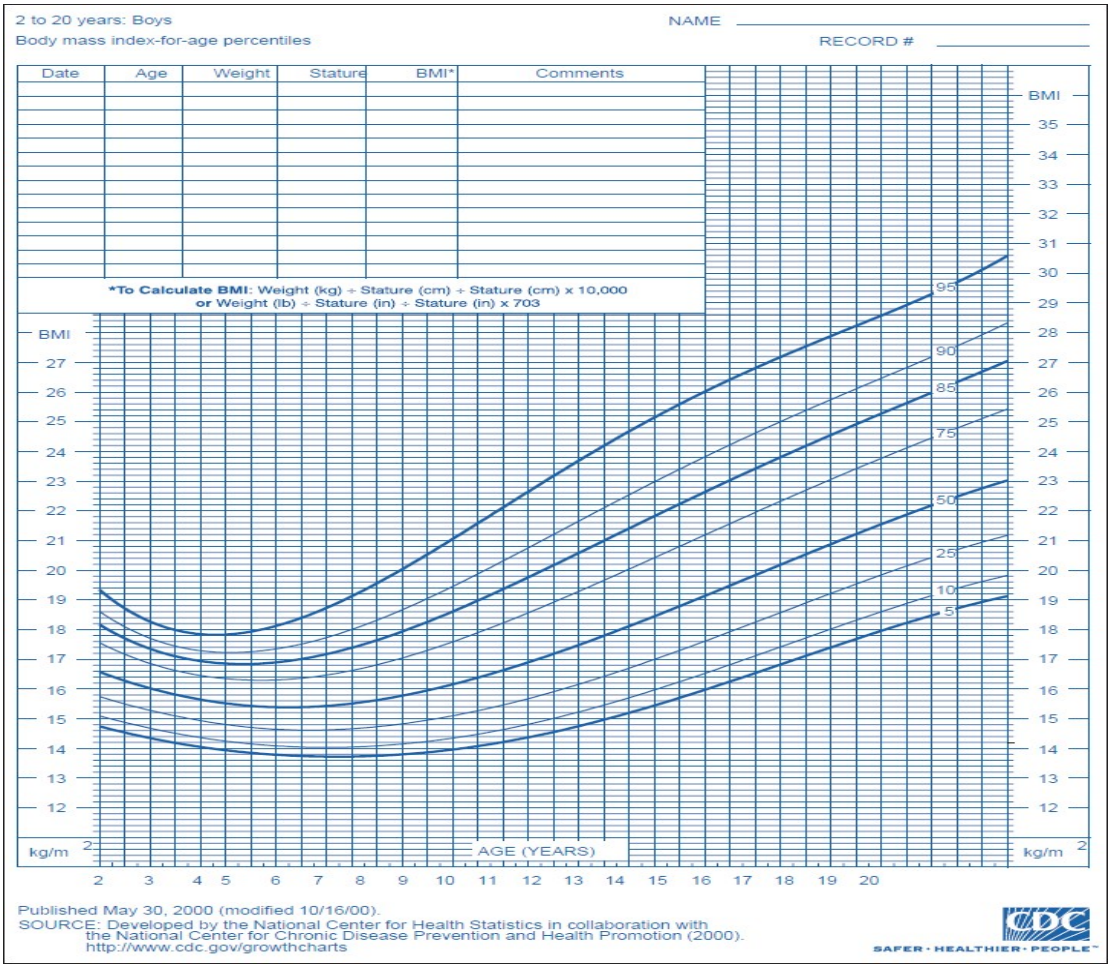

Figure *10.* The above chart is an example BMI-for-age percentile growth chart. Adapted from CDC, 2015.

Figure 11. Girls BMI for age percentile chart

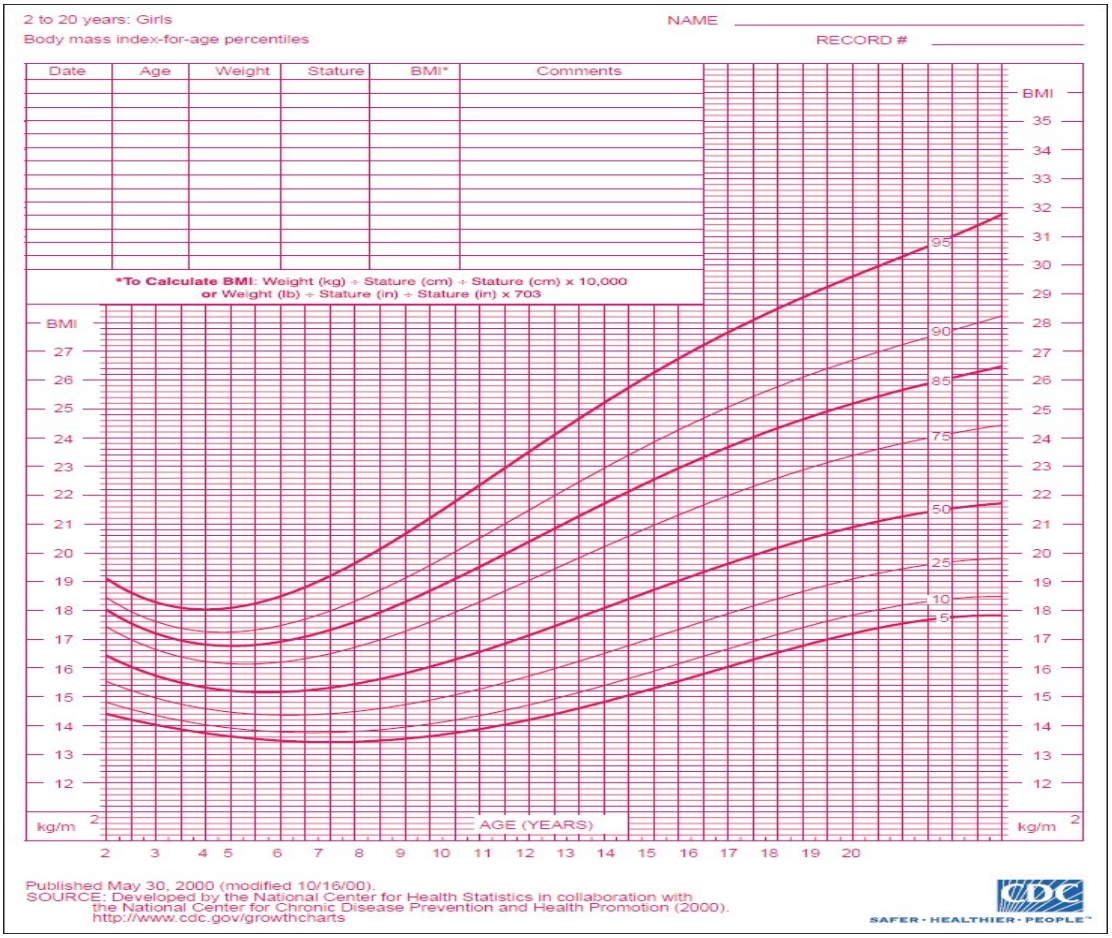

Figure *11*. The above chart is an example BMI-for-age percentile growth chart. Adapted from CDC, 2015.

Figure 12. Boys 2 to 20 years: Stature-for-age and weight-for-age percentiles

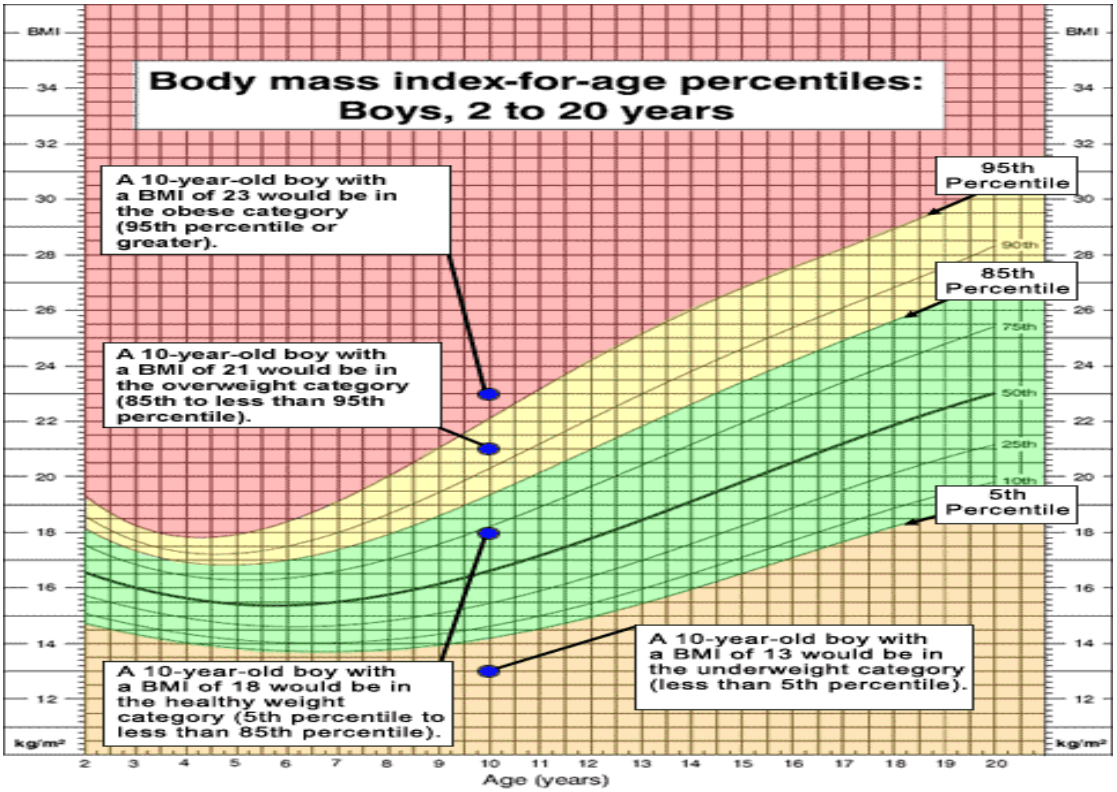

Figure *12.* The above table is an example of BMI numbers would be interpreted for a 10-year-old boy (CDC, 2015). Adapted from CDC (2015).

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