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Implementation and Evaluation of a Practice Change Incorporating a Weight Loss Strategy for Adolescent Patients with a BMI Percentile in the Overweight and/or Obese Category

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Implementation and Evaluation of a Practice Change Incorporating a Weight Loss
Strategy for Adolescent Patients with a BMI Percentile in the Overweight and/or Obese
Category

Anita C. Fouch, MSN, APRN, FNP-BC

Doctoral Capstone Project submitted to the
School of Nursing
at West Virginia University
in partial fulfillment of the requirements
for the degree of

Doctorate
of
Nursing Practice

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ABSTRACT

Implementation and Evaluation of a Practice Change Incorporating a Weight Loss Strategy for Adolescent Patients with a BMI Percentile in the Overweight and/or Obese Category

Anita C. Fouch, MSN, APRN, FNP-BC

Background: Adolescent obesity has become an epidemic nationwide and globally. In Ohio, rates of obesity among African American, Hispanic and other minority students continues to rise. Adolescent obesity increases the risk of developing co-morbid health issues, such as Type II Diabetes Mellitus (T2DM), hypertension (HTN) and fatty liver disease.

Objective: To implement and evaluate a practice change incorporating a weight loss strategy in a large pediatric gastroenterology clinic for adolescent patients with a body mass index percentile (BMI) in the overweight and/or obese category.

Method: The capstone project practice change involved the use of a *nosugaradded* beverages weight loss strategy used by the physicians and nurse practitioners in the department after identifying the adolescents who were either overweight or obese based on their BMI percentile. The project was evaluated with pre- and post –intervention chart reviews.

Population: The twenty physicians and seven nurse practitioners in the Pediatric Gastroenterology Department at Nationwide Children’s Hospital in Columbus, Ohio.

Expected Outcome: To increase proportionally the number of adolescent patients who are diagnosed with overweight and/or obesity, increase the percentage of a specific weight loss strategy for adolescent patients diagnosed with overweight and/or obesity and increase the number of referrals to a weight loss center or other comparable facility based on the diagnosis of obesity among adolescents.

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Adolescent obesity has become an epidemic nationally and globally. Pediatricians and other family practice providers are in key positions to identify when the adolescent first becomes at risk for overweight and/or obesity. Pediatric sub-specialists, such as gastroenterologists, are also in key positions to diagnose overweight and/or obesity. However, pediatric sub-specialists often do not make the diagnosis of overweight and/or obesity and focus instead on the chief complaint identified by the referring provider.

Therefore, the purpose of this project is to improve the diagnosis of overweight and/or obesity and increase the use of two specific strategies for overweight and/or obesity within the Pediatric Gastroenterology Department at Nationwide Children's Hospital in Columbus, Ohio (OH). Specifically, the weight loss strategies to be evaluated with this project are the implementation of a no-sugar added beverages recommendation for weight loss and a referral to the Center for Healthy Weight and Nutrition or another comparable facility for the obese adolescents. The *no-sugar added* weight loss strategy compliments the policy the hospital adopted in January 2011. The hospital and its satellite facilities stopped selling sugar-added beverages at that time. This paper includes the background on adolescent obesity, an overview of the current scientific evidence related to adolescent obesity and a description of the clinical intervention.

Background and Significance

Epidemiology

Weight status, including overweight and obesity, is measured by the body mass index (BMI). The BMI is calculated as weight in kilograms divided by heights in meters squared. In children and adolescents the BMI is compared to sex and age-specific reference values. Once the BMI is plotted on the sex- and age-specific growth chart, a BMI percentile is assigned.

The Centers for Disease Control (CDC) designates an individual overweight if the BMI falls within the 85th to less than the 95th percentile and obese if the BMI is equal to or greater than the 95th percentile (CDC, 2001). Nationwide Children's Hospital utilizes the CDC growth chart, therefore, a BMI percentile is obtained for every patient. The World Health Organization [WHO] (2012) defines overweight as a BMI greater than or equal to 25 and obesity as a BMI greater than or equal to 30.

Adolescent obesity is a major health concern especially as the nation is experiencing an obesity epidemic. One third of children and youth in America are either obese or at risk of becoming obese (Koplan, Liverman, Kraak, & Wisham, 2007). The obesity rate has more than doubled for youth ages 12-19 years (from 7% to 19%) and quadrupled for children ages 6-11 years (from 4% to 19%). Statistics show overweight adolescents have a 70% chance of becoming obese adults (U.S .DHHS, 2007). Ohio's (OH) obesity rate was 13th in the nation according to the "*F as in Fat Report*" (2010). Nearly 36% of OH children ages 10-17 years are overweight or obese and 19% are obese ("OH Obesity Prevention Plan," 2008). Overall, the rate of overweight and obesity increases with age in OH until age 65 years.

The obesity epidemic has been present for some time, but has recently been spotlighted largely in part to research conducted at the Center for Disease Control and other institutions. Ogden, Flegal, Carroll & Johnson (2002) documented increases in the prevalence of overweight for all age groups nationwide from 11% to 16% in 12- to 19-year olds, from 11% to 15 % in 6-to 11-year olds, 7% to 10 % in 2-5- year olds, and a 10-point increase in Mexican American and non-Hispanic Black adolescents . Ogden, et al. (2004) presented further data that the prevalence increased from 14% to 16% for female children and from 14% to 18% for male children. Therefore, the evidence is compelling that obesity is more prevalent in certain race/ethnic

groups. In 2007, 18% of the U.S. black student population was overweight compared to 16% in OH (“A Report on the BMI,” 2008). Among white students, 11% of the US population was overweight and 12% in OH. For the Hispanic population, 17 percent were overweight nationwide and in OH, 14 percent met the criteria.

Many factors contribute to obesity in adolescents, including an excessive intake of calories compared to energy expended (Wolford, 2008). Other factors are changing meal environment (fewer meals prepared at home and more consumed in restaurants), food availability, lack of nutritious meals and snacks served at school and increased television viewing and video game playing (Siedentop, 2005). Parents often cite transportation difficulty, lack of physical activity in the neighborhood, costs, parents’ lack of time, and concerns for neighborhood safety as barriers to having their children become more physically active according to Siedentop (2005).

Both genetics and environment have been linked to the obesity risk. A study with twins has shown that those who are more physically active are less likely to be obese (Mustelin, Silventoinen, Pietilainen, Rissanen, & Kaprio, 2009). The authors found that physical activity modified the heritability of BMI and waist circumference (WC) with a high level of physical activity decreasing the additive genetic component in BMI and waist circumference. This finding could suggest that inherited factors influence body weight and adiposity in sedentary subjects. Thus, physical activity could be especially advantageous in the prevention of weight gain for individuals genetically susceptible to obesity.

The relationship between waist circumference and physical activity could suggest that waist circumference is more predictive of obesity than BMI, especially in young males. Physically active young males tend to have large muscle mass which affects BMI more than waist

circumference. Physical activity may also reduce body fat, especially in the abdomen, increase gastric motility and acid secretion while reducing locomotor activity.

One study analyzed data obtained from a total of 23 twin birth cohorts from four different countries: Canada, Sweden, Denmark, and Australia (Dubois, Ohm, Girard, Tatone-Tokuda, Perusse, Hjelmberg, Skytthe, Rasmussen, Wright, Lichtenstein & Martin, 2012). Analyses included data from same-sex and opposite sex twin pairs with available measures for both height and weight at a given age, from birth through 19 years of age. The study was conducted in four waves, starting in 1994 (when the twins were 8–9 years old), then again in 1999 (at age 13–14 years), in 2002 (at age 16–17 years), and in 2006 (at age 19–20 years). Questionnaires were administered to the parents and twins over the telephone. The twins' heights and weights at later ages were parent self-reported in the questionnaires, whereas the birth weights were taken from the Swedish Medical Birth Register. Upon conclusion of the study, the findings suggested genetics does influence body height and BMI in both males and females.

Another study reviewed the effects of metabolic factors, specifically the hormones leptin, ghrelin, and adiponectin and how they influence appetite and satiety (Gale, Castracane & Mantzoros, 2004). Leptin is primarily involved in energy homeostasis and satiety. Leptin levels in the circulation are increased in proportion to fat mass, and circulating leptin conveys information to the hypothalamus regarding the amount of energy stored in adipose tissue, suppressing appetite and affecting energy expenditure. Whereas leptin suppresses the appetite, ghrelin stimulates food intake, enhances the use of carbohydrates and reduces fat utilization, increases gastric motility and acid secretion and reduces locomotor activity. Adiponectin acts as an insulin-sensitizing hormone whose blood concentrations are reduced in obesity and T2DM. These authors did not conduct a study to review whether these hormones affect obesity. Rather,

they did a review of how these hormones work and how they could potentially affect obesity. The authors believe there is a correlation between these hormones and their influence on obesity. Ultimately, they concluded more research with appropriate animal studies was necessary and then human studies to further refine the relationship. Human studies were recommended to evaluate obesity treatment, particularly anti-obesity medications.

Adolescent obesity increases the risk of developing co-morbid health problems, such as diabetes mellitus type II, hypertension, hypercholesterolemia and fatty liver disease (Barlow & The Expert Committee, 2007). Additionally, it can lead to low self-esteem, depression and negative body image. If these co-morbid problems exist in the parents, the adolescent is further pre-disposed to becoming an obese adult. As the medical setting is often the first point of contact for families, pediatricians are instrumental in the identification and referral of children with psychological complications. This will be discussed in further detail later.

Motivational interviewing, brief screening measures, and referral resources are important tools in the process of evaluating obese adolescents as they are more likely to engage in high-risk behaviors, such as smoking and alcohol consumption (Strauss, 2000 and Jackson, 1997). Any practitioner who sees an overweight and/or obese adolescent can make a referral for further evaluation if there is concern for low self-esteem, depression, anxiety, bullying or any other psychosocial problem associated with overweight and/obesity.

The cost of care associated with adolescent obesity

The economic consequences of obesity are significant. Nearly \$100 billion is spent annually to treat the consequences (Goldberg, 2005). Ohio spends an estimated \$3.3 billion annually to address the consequences of limited physical activity and poor nutrition. Obesity-related medical costs are nearly 10 percent of all annual medical spending (Finkelstein, Trogden, &

Cohen, 2009). Medicare and Medicaid are responsible for \$61.8 billion of that cost. Childhood obesity is responsible for \$14.1 billion in direct costs (Trasande & Chatterjee, 2009). Annually, the average total health expenses for a child treated for obesity with Medicaid is \$6,730 while the average health care cost for all other children covered by Medicaid is \$2,446. The average total health expenses for a child treated for obesity with private insurance is \$3,743, while the average health care cost per child for all other children covered by private insurance is \$1,108 (Marder & Chang, 2006). These costs are not surprising given that hospitalizations of children with a diagnosis of obesity nearly doubled between 1999 and 2005 with total costs for children and youth with obesity-related hospitalizations increased from \$125.9 million in 2001 to \$237.6 million in 2005 (Trasande & Chatterjee, 2009).

Emergency responders and health care providers face unique challenges transporting and treating the heaviest patients (Berger, 2007). A typical ambulance outfitted with equipment and two emergency medical technicians (EMT's) can transport a 400-pound patient and costs \$70,000 (Zezima, 2008). A standard hospital bed can hold 500 pounds and costs \$1,000 whereas a bariatric bed that can hold up to 1,000 pounds costs \$4,000. Therefore, healthcare systems face financial challenges to provide care to the obese patient.

Rising health care costs and a workforce with increasing healthcare needs are driving down the nation's ability to compete in the global economy (Finkelstein et al., 2009). The obesity epidemic increases direct and indirect healthcare costs for employees, government agencies, and consumers (Kottke, Wu, & Hoffman, 2003). Direct costs include preventive, diagnostic and treatment services and indirect costs include lost wages because of illness or disability and lost future earnings as a result of premature death (U.S. PSTF, 2003). If the current trend continues nationwide, obesity will account for more than \$860 billion annually or more than 16% of the

health care expenditures by 2030 (F as in Fat, 2010). Therefore, early prevention and /or treatment of obesity are paramount.

Health Sequela of Adolescent Obesity

Childhood and adolescent obesity has been associated with chronic diseases, including Type II Diabetes Mellitus (DMT2), hypercholesterolemia, hypertension (HTN), hepatic steatosis, adverse psychological health risks, including low self-esteem and negative social development, including discrimination and prejudice (Deckelbaum & Williams, 2001). These health problems, if left untreated, will have major consequences. The worst consequence will be the likelihood that children will live less healthy and shorter lives than their parents (Siedentop, 2005). The most beneficial way to prevent this from occurring is for healthcare providers to implement treatment once the child or adolescent is first identified as being overweight. Waiting until the child or adolescent becomes obese delays treatment and increases the risk for comorbid conditions.

The most concerning comorbid medical problem associated with obesity in the pediatric gastroenterology department is nonalcoholic fatty liver disease (NAFLD). The providers in the pediatric gastroenterology department are seeing more adolescents for elevated liver enzymes or fatty liver infiltrates as evidenced by laboratory tests and/or abdominal ultrasound. Nonalcoholic fatty liver disease does not cause symptoms, therefore, it can only be diagnosed by evidence of hepatic steatosis, either by imaging or by histology (Chalasani, Younossi, Lavine, Diehl, Brunt, Cusi, Charlton, & Sanyal, 2012). Other causes for secondary hepatic fat accumulation, such as significant alcohol consumption, use of steatogenic medication (amiodarone, methotrexate, valproate, and/or corticosteroids) or hereditary disorders, such as hepatitis C, Wilson's disease, starvation, parenteral nutrition, Reye's syndrome, HELLP syndrome (Hemolysis, Elevated liver

enzymes and low platelet count), inborn errors of metabolism or Wolman disease, need to be considered first (Chalasani, et al., 2012). Nonalcoholic steatohepatitis (NASH) is recognized as a risk factor in obesity. Therefore, screening for liver disease is imperative in adolescents whose BMI percentile is greater than or equal to the 85th percentile.

Adolescence

Adolescent development is the normal process of transition from childhood to adulthood (Kaufman, 2006). The transition includes cognitive changes from being a concrete to an abstract thinker, of moving one's primary contacts away from the family, of becoming sexually aware, and of identifying one's own self-worth, and place in the world. Transition to adulthood often relies on increasing independence. Adolescents are dependent on parents or caregivers, medication, and/or technology. Therefore, the transition to adulthood can be challenging.

Given the high prevalence of overweight and/or obesity among adolescents, it is imperative that all practitioners involved in their care make the diagnosis and prescribe a treatment plan. Some perceived barriers to obesity treatment are lack of patient (adolescent) motivation, family involvement, and support services (Story et al., 2002). Education about prevention of adolescent obesity is essential. Education should include the associated risk factors associated with being overweight and/or obese. The practitioners in the gastroenterology department especially need to discuss the role of the liver and how it is affected by increased weight gain. The healthcare provider needs to include the families and obese adolescent when planning any treatment.

Challenges to providing care for adolescent patients who are overweight and/or obese include, but are not limited to, the adolescent's perception of his/her weight, the parents' perception of weight, socioeconomic status and willingness and motivation of the adolescent to lose weight.

Of these, it is imperative the practitioner get a sense of whether the family and adolescent perceive there is a problem with weight. If the family and adolescent don't believe there is a problem, it is going to be challenging for the practitioner to make the diagnosis of overweight and/or obesity and make the appropriate treatment recommendations. If not all are in agreement, the practitioner could be at risk for offending the family and adolescent.

Additionally, the attitude of the practitioner toward overweight and obesity must be considered. In a study among general practitioners and community practitioners in Canada (He, Piche, Clarson, Callaghan, & Harris, 2010), the following barriers to the identification and treatment of overweight and obesity were identified: too few dietitians available, lack of success in controlling what patients eat, time constraints to providing meaningful discussions about weight and monitoring, lack of availability of team support and limited professional training. Other reasons were concern regarding hurting patient's self-esteem, too few specialists to refer to and lack of appropriate educational material. Another reason was the concern for precipitating an eating disorder by discussing the patient's current weight. Yet another concern was billing constraints. While this study was done in Canada, some of the concerns or barriers are probable among the practitioners in the gastroenterology department, as well as other sub-specialty clinics at Nationwide Children's Hospital.

Theoretical Framework

The Transtheoretical Model (TTM) is an integrative model of behavior change that incorporates process oriented variables to predict how and when individuals are willing to change behaviors (Prochaska & Norcross, 1979). The TTM was designed to integrate processes of change across leading theories of behavior and psychotherapy. Central to the core of the theory is a stage of change involving six processes. The six processes build on each other and

evolve over time. The six processes are: pre-contemplation, contemplation, preparation, action, maintenance, and termination. While relapse is not an actual process, it is a possibility and can occur during the other processes. The Transtheoretical Model of Change was initially designed to assist smokers with their addiction to nicotine. However, it can be easily incorporated into this capstone project involving overweight and/or obese adolescents.

Key Elements of the Transtheoretical Model of Change

Pre-contemplation is the stage in which the adolescent is not intending to address his/her overweight or obese status in the foreseeable future. The reason could be that the adolescent is not fully engaged in committing to the lifestyle modifications necessary to lose weight. Another reason could be lack of knowledge with regard to the options available to assist with the weight problem and unhealthy lifestyle. It is feasible that the adolescent may not realize what being overweight or obese means. For the practitioners in the Pediatric Gastroenterology Clinic, this phase could represent a problem-focused approach to treating the adolescent. If the adolescent was not referred specifically for overweight and/or obesity, the provider could deliberately choose to not address the weight. The reasons to not address the weight could be as simple as lack of time to focus on the chief complaint and the weight. Also, billing constraints could be a reason for the provider to ignore the weight problem. The providers in the department are given an allotted amount of time for new and follow-up patients. The providers could perceive that it will take too much time to discuss the weight and the chief complaint.

During the *contemplation stage*, the adolescent is considering taking action sometime in the next 6 months. This is the point where the adolescent may express ambivalence toward his/her weight despite having been informed by their health care provider that they are at risk for diabetes, heart disease and/or liver disease as a result of their obesity. For the Gastroenterology

(GI) providers, this phase could be manifested as the willingness to acknowledge the patient has an unhealthy weight. However, the practitioner may still be hesitant to pursue the issue. As mentioned previously, time and billing are two big constraints in the department as the clinic will only accommodate seven practitioners at one time. If a provider assigned to be in clinic in the morning addresses problems other than the chief complaint there is the possibility his/her clinic will run over its allotted time. Therefore, the provider assigned to work in the clinic in the afternoon is going to be late by default. This will ultimately impact the clinic flow.

Following the contemplation phase is the *preparation phase*. While in this phase the adolescent has acknowledged the problem and is willing to take corrective action. This phase can last for a month and then evolve into the action phase. The GI providers may be willing to discuss the weight with the patient during this phase. Simple recommendations, such as decreased soda or sugar-added beverage consumption could be recommended as an initial first step in getting the adolescent's weight back into the ideal range for his/her age. It is during this phase that the GI provider may decide that based on labs done to evaluate the chief complaint now reveal other problems, like fatty liver disease. Therefore, the need to discuss the weight with the adolescent and family becomes more of a priority.

Adolescents are more likely to be openly engaged and involved in making lifestyle modifications during the *action phase*. It is during this phase that the obese teen has acknowledged his/her weight as not being in the ideal range. The adolescent is willing to do something about it. The motivation for this could be something as simple as attending the prom and wanting to be in a certain size gown.

Providers during the *action phase* are likely to involve the dietitian to assist the patient with learning how to make healthier food choices. The dietitian is available Monday through Friday

from 8 am to 4 pm in the GI Clinic. The dietitian is available every first and third Tuesday of the month in the Westerville location and every second and fourth Friday of the month in the Dublin location. Two physicians and one nurse practitioner from the group have clinic at these two off-site locations every week. It is during this phase that the GI provider is likely to refer to the Center for Healthy Weight and Nutrition or another comparable facility.

Maintenance is the stage in which the adolescent has been able to sustain the weight loss and is likely encouraged by the progress being made. The more progress that is made, the more motivated the teenager will be to continue making the necessary lifestyle modifications to lose weight. These modifications typically involve making healthier food choices and exercise. According to Proschaska (2008) the maintenance phase can last from six months to five years. Likely the time frame is contingent upon how much weight the individual needs to lose to obtain an ideal weight for his/her age. For the GI providers, this phase presents the opportunity to evaluate how well the initial treatment recommendations were received and implemented by the patient and family and whether other options need to be considered. During this phase, the practitioner has likely developed a standard dialogue to use with all families and adolescents which describes the problem with the weight and how it needs to be addressed. The majority of the providers in the department rely on dot phrases within the electronic medical record to convey their treatment recommendations. By utilizing a dot phrase, the provider can save time by clicking a dot phrase which represents standard information related to a particular disease or illness that does not need to be specific to the patient, but to the problem.

The last phase is the *termination stage*. This is the stage in which the individual is not likely to be tempted and they are confident in their ability to sustain (Proschaska, 2008). For purposes of this capstone, it would be the ability of the adolescent to sustain healthy eating choices and

live a healthier lifestyle. During this phase the adolescent should automatically choose baked chips over the regular, diet soda over regular soda or juice or the grilled chicken over the fried as the dietitian reinforces how these simple changes can make a difference in the amount of weight lost. For the GI physicians and nurse practitioners, this phase should correlate with a healthier BMI for the adolescent patients being seen for follow-up, regardless of the initial referring diagnosis. It could also be the phase in which the provider reviews lab results and is able to assure the family and adolescent that the weight loss can be correlated by the presence of more normal liver enzymes. It also presents a good opportunity for the practitioner to reinforce the healthy lifestyle modifications that have been made.

Prochaska & Norcross TTM Literature Review

The Transtheoretical Model was used by Evers, Paiva, Johnson, Cummins, Prochaska, Prochaska, Padula, & Gokbayrak (2012) to evaluate its effectiveness with alcohol, tobacco and other drug interventions in middle schools across the U.S. Middle schools make good venues for intervention delivery since youth rarely self-initiate cessation of either tobacco or drug use. Twenty-two middle and junior high schools from across the U.S. were recruited from rural, working towns, suburbs, inner-city schools, urban blue collar and urban cores with preference given to schools with higher percentages of students eligible for free lunches. Schools were matched on key variables (type of community, region in the country, and percentage of students receiving free lunches) and placed into two different groups. The two groups were then randomly assigned to be the control or treatment group. The sample for both groups consisted of 52.6% males and 47.4% females. The largest group was in grade 7. The ethnicity of the students was 76.36% white, 10% African-American and 11.8% Hispanic. Thirty-seven percent of the students were eligible for free lunches.

The overall program was population-based, with separate arms for cessation and prevention of alcohol, tobacco, marijuana, and other drug use (Evers, et al., 2012). These authors focused on the cessation arm of the study, which was provided to students who reported having ever previously tried, used or were currently using either alcohol, tobacco, marijuana or other drugs. Thirty-five percent of the students had tried alcohol, 26.2% had tried tobacco, 10.5% had tried marijuana, and 8.3% had tried other drugs. The control group received one pre-test and two post-test assessments (3 and 14 months after pre-test respectively). The treatment group received up to three, 30-minute internet-based, individualized, interactive intervention sessions, staff and administrator guides, and a parent guide. The pre-test was included in the first intervention and was the same as the one used by the control group. The first post-test was completed at the end of 3 months and the final test after 14 months.

According to Evers, et al, (2012) there were no differences between the two groups at baseline (62.2% control vs 59.3% intervention). However, upon completion, there was a six percent point increase in the treatment group who were in Action/Maintenance at post-test 1 compared to decline in the (3.7%) of participants within the control group. There were no significant changes between the two groups at post-test 2. Seventeen percent of the students in the control group had stopped using substances at post-test 1 and 22.4% by post-test 2. The treatment group showed a 33.0% cessation rate at post-test 1 and 28.7% at post-test 2.

Another study by DiNoia, Contento, & Prochaska, (2008) evaluated the effectiveness of the TTM and its impact on increasing fruit and vegetable consumption among economically disadvantaged African-American adolescents. There were 117 African-American students, ages 11 to 14 years, from various youth services agencies located in New York, New Jersey and Pennsylvania assigned to the computer-intervention (CIN) arm of the study. Three hundred and

ninety students were assigned to the non-intervention control group. The CIN students completed four 30-minute intervention sessions tailored on TTM stages and processes of change.

The sample of 507 youths had a mean age of 12.44 years, 61% were female and 15% were Hispanic (DiNoia, et al, 2008). Self-efficacy for fruit and vegetable consumption was measured using a 17-item scale that queried youths' belief in their ability to eat fruits and vegetables in positive social, negative affect and difficult situations. Positive social situations are social interactions that elicit positive feelings and negative social situations are events that trigger bad feelings and difficult situations were those occasions when fruits and vegetables were not available as options.

The largest proportion of youths was classified in the contemplation/preparation stage (55%) at baseline, followed by 33% pre-contemplation and 12 % action/maintenance (DiNoia, et al, 2008). Upon completion of the study, more youths in the CIN had progressed from pre-contemplation to contemplation/preparation and action/maintenance stages ($p < .001$) and from contemplation/preparation to action/maintenance stages ($p < .05$).

Another study by Sarkin, Johnson, Prochaska, & Prochaska (2001) studied the effects of the Transtheoretical Model on exercise in an overweight population. Six hundred and seventy adults with a mean age of 50.9 years were recruited from a list of 2,050 adults provided by a market research company. The mean BMI was 30.6%, 53% were female and 93% were Caucasian. 1 16-page questionnaire that included demographics, self-reported levels of exercise, and constructs from the TTM was mailed to the participants.

This study was interested in how the TTM affected regular moderate exercise. Regular moderate exercise was defined as any planned physical activity such as fast walking, aerobics, jogging, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, dancing,

etc., performed to increase physical fitness (Sarkin, et al, 2001). Stage of change with regard to regular moderate exercise was assessed with a single question using a five-choice response. The format consisted of yes/no and true/false responses. The frequency criterion was set at 5 to 7 days per week and the duration criterion was set at least 20 to 40 minutes per day.

Of the 670 participants (Sarkin, et al, 2001), 654 completed the single item algorithm for stage of change for regular moderate exercise. Pairwise comparisons found the participants in the pre-contemplation stage had significantly lower scores on the pros of regular moderate exercise than participants from the other four stages of change ($p < 0.001$). Those in the pre-contemplation stage had significantly higher cons than those in the maintenance stage ($p < 0.001$). The participants in the preparation stage had significantly higher pros than those in the pre-contemplation, contemplation, and maintenance stages ($p < 0.001$) and more cons than those in the action stage ($p < 0.03$) and maintenance stage ($p < 0.001$). Participants in the action stage had significantly higher pros than those in the maintenance stage ($p < 0.02$) but not more cons ($p < 0.37$).

Search Strategy

The search strategy to identify the most pertinent and relevant evidence-based research studies or articles about BMI, obesity, overweight, diagnosis and treatment in obese adolescents was conducted on several well-known websites including PubMed, National Guideline Clearinghouse, Cochrane Library, Medline and CINAHL. The keywords used were BMI, obesity, overweight, prevention, under diagnosis or diagnosis, identification and adolescents. Adolescents were identified as individuals aged 10-19 years. The search was limited to systematic reviews, national guidelines and randomized controlled trials initially. Then, clinical reviews and other quantitative studies were included in the search. Five clinical practice

guidelines (American Dietetics Association [ADA], 2007) , (Baker et al., 2005), (Daniels et al., 2005), (U.S. Preventive Task Force, 2010) and (World Gastroenterology Organisation [WGO] 2009), two systematic reviews (Atlantis, Barnes, & Singh, 2006 and Flodmark, Marcus & Britton, 2006), three retrospective chart reviews (O'Brien, Holubkov & Reis, 2004, Riley, Bass, Rosenthal, & Merriman, 2005 and Offerman, Rauchwerger, Nishijima, Ballard, Chettipally, Vinson, Reed & Holmes, 2012), one cross-sectional study by (Wethington, Sherry & Polhamus, 2011) and one clinical expert committee review report by (Barlow et al., 2007) were chosen after careful scrutiny.

Review of Literature

A critical appraisal was completed among the twelve selected articles using the appropriate tool. Primarily, the Scottish Intercollegiate Guidelines Network [SIGN] (2007) and the Agree Research Trust (2006) forms were used to critique the selected articles.

The clinical practice guideline published by the American Dietetic Association (2007) was designed to assist dietetic practitioners, patients and consumers make shared decisions about health care choices in specific clinical circumstances, such as pediatric weight management. The recommendations included diet, physical activity, nutrition, counseling, and parent/caregiver participation. No specific diets were recommended. However, if energy restriction is appropriate based on the registered dietitian's professional judgment, then a balanced macronutrient diet that contains no fewer than 1200 kcal per day is recommended to improve weight status within a pediatric weight management program in adolescents ages 13-18 who are medically monitored. For purposes of this project, that would be the Center for Healthy Weight and Nutrition, as they

are staffed with a full-time physician, nurse practitioner, dietitian and physical therapist. They collaborate with pediatric psychology, as well.

The clinical practice guideline by Baker et al., (2005) was developed to provide assistance with the treatment of overweight and obese children and adolescents. Lifestyle modifications were suggested as the first choice in the treatment. Lifestyle modifications included, but were not limited to, eating a low saturated fat diet and engaging in physical activity which was sustainable and enjoyable, such as basketball. A low saturated fat, moderate total-fat diet (<30%) with five fruits and vegetables a day is consistent with the food guide plate and was generally recommended. High-fiber foods and avoidance of highly refined starches and sugars was recommended to decrease caloric intake and promote weight loss. Behavior modifications were also recommended, but, no specific behavioral modifications were suggested. Psychological counseling specifically targeting emotional feelings of low self-worth, depression, and shame is an essential part of treatment for obese children and adolescents. Parents were encouraged to increase a child's self-esteem by giving the child positive, supportive messages that promote learning, decision making and self-confidence. Regular physical activity may also help increase self-esteem.

The clinical practice guideline by Daniels et al., (2005) was designed to help practitioners in the prevention and treatment of overweight in children and adolescents. Lifestyle modifications, including diet and exercise were recommended as treatment before considering other alternatives, such as bariatric surgery. Dietary recommendations included, but were not limited to, consuming more fruits and vegetables and preparing and eating meals at home. Additional dietary recommendations included providing adequate nutrition by offering a variety of foods low in saturated fats (<10% kcal), total fat (approximately 30% kcal), and cholesterol (<300

mg/d) and promoting age-appropriate serving sizes, which includes greater than 5 servings of fruits and vegetables, 3 servings of dairy products and 6 servings of whole-grain and grain products and adequate dietary fiber (age in years + 5 g/d). Salt and sugar should be limited. Counseling and recommendations must be made within the context of the family's culture, living environment, and socioeconomic status. Most dietary strategies for weight loss emphasized balance, variety, and adequacy of the overall eating pattern.

Exercise recommendations included any activity which increased the heart rate and was sustainable for 30 to 60 minutes daily. Recommended activities must be enjoyable and congruent with the child's and family's lifestyle and be rewarding independent of the health benefit. A complementary approach for weight loss was for parents to restrict sedentary free-time activities to less than 2 hours per day.

The clinical practice guideline by the U.S. Preventive Services Task Force (2010) provides guidance for how to screen for obesity in children and adolescents using BMI. The guideline advocates for moderate- to high intensity behavioral interventions for obese children aged 6 years and older if the BMI is in the overweight and/or obese category. Behavioral counseling interventions included behavioral modification, special diets, and/or activity components delivered to children and/or parents as individuals or in groups by primary care clinicians or related health care staff members, to help patients change or maintain health behaviors affecting overweight and obesity. Talking to families about energy balance behaviors that might help prevent obesity and promote good health was suggested. Those behaviors include limiting television viewing, encouraging outdoor physical activity or play and limiting the consumption of sugar-sweetened beverages.

In the clinical practice guideline from the World Gastroenterology Organisation (2009) the focus was on the assessment and management of obesity. Lifestyle modifications were the first choice for management. The lifestyle modifications included diet (low-fat, low-carbohydrate, high fiber, low glycemic index or high protein), less sedentary lifestyle, exercise, and behavior changes. The behavior changes included goal-setting, self-monitoring by use of a food and activity diary, cognitive restructuring (perception of eating habits) and relapse prevention. Medication for weight loss should only be considered if the overweight and/or obese adolescent does not achieve a weight loss of 5% to 10% in 6 months. Bariatric surgery was considered the last step in the treatment of overweight and/or obesity.

In the systematic review by Atlantis et al., (2006), the authors looked specifically at the efficacy of exercise as a treatment for overweight children and adolescents. The systematic review contained thirteen papers and fourteen studies pertinent and relevant to the topic. An aerobic exercise prescription of 155–180 min/weeks at moderate-to-high intensity is recommended for both male and female overweight and obese adolescents as this amount was shown to be effective in reducing body fat. However, overall effects on body weight and central adiposity were not demonstrated. The authors of the review found exercise, treatment, compliance and modality were different among the fourteen studies. The majority of the fourteen studies involved aerobic exercise at moderate-to-high intensity and were of wide-ranging durations. However, four studies included aerobic exercise and weight training in conjunction with dietary interventions. None of the studies reported changes in habitual activity or sedentary levels beyond the prescribed aerobic activity.

In the systematic review by Flodmark et al., 2006, twenty-four studies were included. Among these 24 studies, there were 25, 896 children/adolescents. Of these 24 studies, eight reported the

prevention measures of diet and exercise had a positive effect on obesity, 15 reported neutral results and none reported negative results (sign test; $p=0.0078$). Therefore, the authors of the review believe by offering adolescents healthier food choices and encouraging physical activity, it is possible for the adolescent to lose weight and alter their BMI. Outcome measures varied among the 24 studies. Some of the studies used BMI whereas others used skinfold thickness. Intervention periods and follow-up periods varied among the studies, as well. Therefore, the authors were not able to add the results in any type of meta-analysis.

The first retrospective chart review (O'Brien, et al., 2004) was performed at Children's Hospital of Pittsburgh Primary Care Center during a three-month consecutive period between December 2001 and February 2002. Children's Hospital of Pittsburgh is a tertiary-care, academic pediatric hospital which serves predominantly urban, minority medical assistance-insured patients. Chart reviews were conducted among the pediatric residents, nurse practitioners and faculty physicians who provided care in the primary care center. Two thousand and fifteen charts were reviewed. Patients less than 3 months of age were excluded. Likewise, follow-up visits were not included.

Based on the chart review (O'Brien, et al., 2004), two hundred forty-four patients met the criteria for obesity, which created an estimated prevalence of obesity visits of 9.7% (244 of 2,515) for children aged 3 months to 16 years (O'Brien, et al., 2004). However, the providers only documented obesity for 53% of the reviewed visits (129). The majority of the charts (69%) contained dietary history and 15% included activity level. Obesity was noted in the physical examination in 39% of the reviewed cases.

O'Brien et. al (2004) found that among the children for whom the diagnosis of obesity was made, the clinician had addressed dietary history 81% of the time, but only 27% included the

child's activity level or television viewing time. Obesity was noted in the physical examination in 64% of the cases where the diagnosis of obesity was noted by the provider. Obesity identification was lowest among preschool-age children (31%) and highest among adolescents (76%). Providers tended to note the activity level more often in the chart of the older child as compared to the preschool child.

In another retrospective chart review 2,256 medical records of children ages 2 to 18 years from 715 visits were reviewed from five outpatient clinics at Stanford University (SU) and the University of California San Francisco (UCSF) between July 2003 and September 2003 (Riley, et. al., 2005). The General Pediatrics Clinic from SU was included along with Pediatric Endocrinology from SU and UCSF and Pediatric Gastroenterology from both. Only well-child visits were included. Charts were excluded if they did not include a height and weight. All the patients were seen by an attending physician with or without a resident, fellow or nurse practitioner. Of note, both facilities have access to a dietitian daily and both have a multidisciplinary pediatric obesity program.

During the chart review conducted by Riley and others (2005), the authors found that 715 visits (32%) involved children with a BMI percentile $\geq 85\%$ and 19% of the visits included children with a BMI percentile $\geq 95\%$. Forty-one percent of the General Pediatrics Clinic visits involved overweight children, 38% of the visits were in the Pediatric Endocrinology Clinics and 20% were in the Pediatric GI Clinic. Children with a BMI percentile between the 85th percentile to the 94th percentile were categorized as overweight during 4% to 8% of the visits and children with a BMI greater than the 95th percentile were given a diagnosis of overweight during 48% of the visits.

Compared to the General Pediatric Clinic visits, the Pediatric GI visits were less likely to include nutritional counseling (13% vs 37%) but were more likely to include screening for non-alcoholic fatty liver disease (23% vs 2%) (Riley, et. al., 2005). Pediatric Endocrinology visits included NAFLD screening (2% vs 10%), metabolic screening (8% vs 34%) and dietitian referral (3% vs 8%). Nutritional counseling was provided during 66% of visits involving a diagnosis of overweight, compared with only 9% without the diagnosis of overweight.

A retrospective study done in the emergency departments at five California hospitals demonstrated that the incidence of missed data points was lower in those cases where the dot phrase (DP) data collection instrument was used as opposed to documentation on paper alone (Offerman, Rauchwerger, Nishijima, Ballard, Chettipally, Vinson, Reed & Holmes, 2012). The study investigators collected data error and omission rates during the 18 months of the study. They defined a data omission or error as any data field that was left empty or was unclear. The study was a retrospective review of data collection methods during the first 18 months of a multi-center study of emergency department (ED) head injury patients. Patients presenting to one of five study EDs with head injury and taking anti-coagulant medication (warfarin or clopidogrel) were eligible for inclusion. Treating ED physicians identified and enrolled eligible patients. These physicians then completed a prospective data form answering questions related to the primary study objectives. They had the option of completing a paper data collection form or an electronic DP data collection form inserted as a structured note template into the electronic medical record (EMR) at the end of their ED note. Two hundred and thirty-four of 595 paper data forms contained a data error or omission (39.3%; CI 35.4, 43.3) and 19 of 288 DP data collection templates contained data omissions or errors (6.6%; CI 3.7, 9.5). The difference in omissions or error rates was 32.7% (95% CI 27.9, 37.6%, $P < 0.001$) between DP and paper data

collection forms. The incidence of missed data points was lower in those cases where the DP data collection instrument was used. Because the EMR system will not allow a note to be “accepted” (closed) until all template prompts have been addressed, note writers must satisfy all prompts (Offerman, et. al., 2012). This substantially improves data collection integrity by reducing rate of data collection omissions. This same principle can be applied to daily documentation in a patient’s EMR during an outpatient office visit in the Pediatric GI Department.

In the cross-sectional study by Wethington, et al. (2011), the authors reviewed the DocStyles 2008 surveys of pediatricians (PEDs) and general practitioners (GPs) to assess the diagnosis of obesity based on the BMI of the child. Additionally, the survey included data about the providers comfort level in explaining the BMI, making referrals to specialists, and other screening and counseling related to the care of the overweight and/or obese child. Two hundred fifty pediatricians and 621 GPs were surveyed. The PEDs diagnosed obesity based on BMI more frequently than the GPs (50% vs 22%). Ninety-four percent of the PEDs expressed concern in explaining BMI vs 87% among the GPs. However, 65% of the PEDs group had access to other specialists compared to 42% in the GPs group. The PEDS group demonstrated more counseling than the GPs group.

In the expert committee recommendation review by Barlow, et al. (2007), BMI was the preferred measure of obesity and it was recommended that it be calculated at each well-child visit and should be the starting point for classification of health risks. Children in the healthy-weight category (BMI of 5th–84th percentile) have lower risks, although parental obesity, family medical history, and current diet and physical activity behaviors may alter that assessment. These children and their families should receive support in maintaining or establishing healthy lifestyle

(prevention) behaviors. The likelihood of health risks increases in the 85th to 94th percentile (overweight) category and again is influenced by parental obesity, family medical history, and current lifestyle habits, as well as BMI trajectory and current cardiovascular risk factors. Some of these children need prevention counseling, whereas others need more-active intervention. Children with a BMI above the 95th percentile (obese) are likely to have obesity-related health risks, and most should be encouraged to focus on weight control practices. Providers were asked to use clinical judgment in assessing health risks, because no formula exists that can incorporate BMI pattern, family background, and health behaviors to determine future weight.

Limiting consumption of sugar-sweetened beverages, encouraging consumption of fruits and vegetables, limiting television and other screen time, eating breakfast daily, limiting the number of meals consumed at restaurants, particularly fast food, were some of the recommendations by this expert committee panel (Barlow, et. al., 2007). Families should be encouraged to eat with their children and limit portion sizes. Other dietary recommendations called for a diet rich in calcium and high in fiber, while balancing carbohydrate, protein and fat consumption in proportion to age. Likewise, consumption of energy-dense foods was discouraged. Vigorous physical activity for 60 minutes each day was recommended.

Synthesis

The evidence collected and critiqued from the five clinical practice guidelines American Association of Dietetics [ADA], 2007; Baker et al., 2005; Daniels et al., 2005; U.S. Preventive Task Force, 2010 and [WGO] 2009; two systematic reviews (Atlantis, et al. 2006 and Flodmark, et al., 2006); two retrospective chart reviews (O'Brien, et al., 2004 and Riley, et al., 2005); the cross sectional study (Wethington, et al., 2011) and the clinical expert committee review (Barlow, et al., 2007) provided support for this investigator's project to improve the diagnosis

and treatment of overweight and/or obesity among adolescent patients seen in the Pediatric Gastroenterology Department with a BMI greater than the 85th percentile.

Project

Obesity continues to be a national and global problem. Therefore, pediatricians, nurse practitioners, physician assistants and general practitioners are in pivotal positions to identify adolescents at risk and implement corrective action immediately. Once the adolescent has been informed his/her BMI is no longer within the ideal range, structured weight loss programs like the New U Program within the Center for Healthy Weight and Nutrition at Nationwide Children's Hospital can be offered to assist the adolescent in achieving a healthier lifestyle. Parents/guardians and teachers are in prime positions to identify when the adolescent first develops a weight that is concerning, as well. Education about the consequences of overweight and obesity is paramount, especially with regard to cardiovascular complications. Additionally, more research into strategies to prevent and treat adolescent obesity is needed.

Project's Congruence of Organization's Strategic Plan

The setting of this project was Nationwide Children's Hospital in Columbus, OH. The mission statement of the hospital is to provide the highest quality of care during and after the treatment process, provide best outcomes during and after care, and provide for the long-term health care needs of children of all ages in the community. The practice change that was implemented and evaluated in this capstone project was congruent with the hospital strategic goals across the three horizons detailed in the mission statement.

Project Description and Design

Based upon evidence from the literature and a clinical problem identified within a practice setting, the capstone project involved an innovative practice change intended to improve the diagnosis of overweight and/or obesity among adolescent patients seen in a large pediatric gastroenterology department. An educational intervention session for providers was accomplished to focus on appropriate diagnosis for adolescent overweight and/or obesity based on the BMI percentile. In support of the hospital's policy of no sugar-added beverages, the intervention recommended to the patients and families of the overweight and/or obese adolescents was to refrain from consuming sugar-added beverages. All adolescent patients who were diagnosed with obesity were either referred to the Center for Healthy Weight and Nutrition or another comparable facility if traveling to and from Columbus was a challenge for the family.

The project was evaluated after six weeks with a post-intervention chart review on a second set of 100 randomly selected charts to determine if there was an improvement in the diagnosis of overweight and/or obesity among the adolescents seen in the department and provider use of the weight control strategies. The project concluded with dissemination of the aggregate data collected from the chart reviews to the physicians and nurse practitioners in the department. The capstone project was congruent with the hospital strategic goals across the three horizons detailed in the mission statement.

Goals and Objectives

The ultimate goal of the capstone project was to improve the diagnosis and treatment of overweight and/or obesity among the adolescent patients seen in the Pediatric Gastroenterology Department at Nationwide Children's Hospital. This practice change would assist the providers

in identifying those at risk and improve the health of the selected patient population. Following are the three main objectives for this capstone project:

1. Increase proportionally the number of adolescent patients who are diagnosed with overweight and/or obesity.
2. Increase the percentage of a specific weight loss strategy for adolescent patients who are diagnosed with overweight and/or obesity.
3. Increase the number of referrals to the Center for Healthy Weight and Nutrition or other comparable facility based on the diagnosis of obesity among adolescents.

Project Design

This capstone project was designed to help the physicians and nurse practitioners in the department identify the adolescents who were either overweight and/or obese. Additionally, the project allowed those same providers to implement a treatment intervention of no sugar-added beverages. The treatment strategy or electronic dot phrase was easily transcribed into the after visit summary the family receives at the end of every office visit. One of the popular EMR systems is Epic, which originated in Verona, Wisconsin, and is utilized at Nationwide Children's Hospital. One of the features of this system is the ability for clinicians to use dot phrases to assist in medical information entry. A dot phrase is a structured note template that may be easily inserted into the EMR. A template is populated into the data entry field when the clinician clicks on it with the computer mouse. The use of dot phrases makes charting repetitive information simple and easy.

Phase one began with the design and development of the practice change. The project was explored by the capstone chair, medical director of the department, and the student after much

discussion about the need for proper diagnosis and treatment of this patient population. Prior to obtaining the approval of the Institutional Review Board (IRB), the following tasks were accomplished: (a) completing CITI training, (b) reviewing and synthesizing the literature pertinent and relevant to the topic, (c) selecting the theoretical framework to underpin the project, (d) completing a needs assessment, (e) securing the capstone site and committee, (f) writing the capstone proposal, (g) obtaining capstone committee approval, and (h) accomplishing IRB approval from both the hospital and the university for the capstone project.

The sample for the project was the providers in the department. The project leader and the capstone committee determined that chart reviews, one pre-intervention and the second, post-intervention, would be the most efficient means to establish how the providers diagnosed and treated overweight and/or obesity in the adolescent population. Next, it was decided that a minimum of 100 patient chart reviews should be accomplished pre-and post-intervention so as to provide a good sampling for statistical testing upon completion of the project. All adolescent patients, ages 10 to 19 years, were included in the chart reviews regardless of the chief complaint. It did not matter whether the patient was established or new to the department.

According to the Transtheoretical Model of Change, the providers were in the pre-contemplation phase during this time of the project. Time and billing constraints were potential barriers to addressing overweight and/or obesity with the adolescent patients for the physicians and nurse practitioners. The providers are given an allotted amount of time to see patients in the department based on whether the patient is established or new. Therefore, the providers could forego addressing an abnormal BMI percentile if there was not enough time allocated to address both the chief complaint and any additional problems.

Phase two began after obtaining IRB approval from the university. The hospital IRB process was completed in advance of the university process since the project was being conducted at the hospital. Phase two correlates with both the contemplation and preparation phases of the TTM. It is during the contemplation and preparation phases that an individual acknowledges a problem and is willing to do something about it. For the providers in the gastroenterology department, this included diagnosing adolescents with overweight and/or obesity and making treatment recommendations to help them reach a healthy BMI percentile. This phase included the (a) meeting with the physicians and nurse practitioners in the gastroenterology department during one of the scheduled weekly meetings to discuss the project, (b) baseline data collection of one hundred randomly selected charts, and (c) placing the laminated cards with the BMI acronym on them at every computer terminal in the clinic to serve as a visual reminder for the providers to address the BMI percentile and make treatment recommendations, specifically use of the *nosugaradded* dot phrase and a referral to the Center for Healthy Weight and Nutrition for the obese patients and a referral to the dietitian or other resource for the overweight patients.

Phase three began after the meeting with the providers during one of the scheduled weekly meetings. An information sheet (Appendix C) was provided detailing the capstone project. The project leader reviewed the information sheet with the other providers and allowed for a question and answer session. The first chart review was accomplished after this meeting. This chart review determined the baseline for how well the providers were diagnosing and treating overweight and/or obesity among the adolescent patients. Laminated cards with the acronym BMI % were placed on the computer terminals in the provider room one week after the start of the project. There was delay in the print shop which precluded the project leader from displaying them upon conclusion of the meeting with the providers. Phase three correlates with the action

phase of the TTM. The providers were willing to take the time to evaluate the BMI percentile on every adolescent patient seen regardless of the presenting diagnosis and implement a treatment plan, namely the *nosugaradded* dot phrase.

Phase four involved evaluation of the practice change. During this phase, the project leader completed (a) the second chart review on 100 randomly selected charts, (b) data analysis with Microsoft Excel 2007 and SPSS 19 and (c) a final written capstone paper. The project leader plans to discuss the findings of the second chart review with the providers in the department during one of the scheduled weekly meetings. The capstone project was closed during phase five. The grand finale will be the presentation of the finished project to the capstone committee. This phase will allow for continuity of similar projects within the department for this patient population.

Upon completion of the project, the providers are considered to be in the maintenance phase. For the GI providers, this phase presents the opportunity to evaluate how well the initial treatment recommendations were received and implemented by the patient and family and whether other options need to be considered. It also allows the other providers in the department to collaborate with the project leader and continue the project. Additionally, it promotes cohesiveness among the GI providers and the providers in the Center for Healthy Weight and Nutrition.

Resources

The primary resource for this project was the EMR. There were no costs associated with conducting the chart reviews or discussing the project with the providers in the department. The laminated cards placed in the clinic cost \$3.25. The department paid for them as the hospital is

supportive of any and all endeavors to promote the health and well-being of our patients and families.

While there were negligible monetary costs associated with the project, the providers did have to give their time in making the diagnosis based on the BMI percentile and implementing the treatment strategies. Participation did not interfere with the other responsibilities of the providers while in clinic.

The providers in the department demonstrated understanding of the project as the project leader would often hear them speaking to one another about checking the BMI while in clinic. The providers verbalized understanding of the project objectives and how they were to be evaluated. Information Services (IS) was helpful in obtaining the list of charts for review with the specific parameters as listed previously.

The data collection tool included demographic information. The data collected included patient age, gender, BMI percentile and any treatment recommendations, but particularly, use of the dot phrase and a referral to the Center for Healthy Weight and Nutrition for the obese patients. There was no personally identifiable information collected.

Budget

There was no budget for this project. A budget was not necessary as the department utilizes an EMR. All the providers have a computer in their office. Additionally, the providers have a designated charting space while in clinic. The providers were asked to spend a little extra time reviewing the weights and BMI percentiles for their patients. However, this is also part of the routine screening that is already required as the majority of the medications prescribed for the pediatric population require an accurate weight and height.

Evidence of Key Site Support

The project was supported by the providers in the department, as well as by the general business manager. The Chief of the Pediatric Gastroenterology Department was very supportive. The Chief had read one of the studies (Riley, et. al., 2005) that had been included in the literature review. The Chief was interested to see how our department was doing with regard to the diagnosis of overweight and/or obesity given this study involved a pediatric gastroenterology department. The business manager was pleased that the project did not involve cost and there was no use of protected health information (PHI). The administrators and providers in the department recognize the importance of conducting projects such as this to further enhance and promote the health and well -being of the patients and families served. The hospital has a research institute that fully supports students and medical professionals from all health care disciplines.

Evaluation

The evaluation phase followed the implementation of the practice change after six weeks. The charts that were reviewed included all adolescents, ages 10 to 19 years, who were seen in the pediatric gastroenterology department, regardless of their chief complaint. Inclusion criteria for the chart reviews were adolescents, ages 10-19 years, BMI percentile greater than or equal to the 85th percentile, and who were seen in the gastroenterology department prior to the start of the project. Exclusion criteria were patients less than 10 years of age, a BMI percentile less than the 85th percentile and adolescents not seen in the department during the six weeks the project was completed. No charts were excluded based on race or ethnicity. The selection criteria were the same for both chart reviews.

The data collection sheet created in Microsoft Word (Appendix D) was designed by the project leader and ultimately approved by the capstone chair. The tool proved to be very useful in that the data needed from the chart reviews was easily obtained from the EMR and transcribed into it. Likewise, this helped simplify the data analysis via Microsoft Excel and SPSS. The first component of the evaluation phase was to compare the pre-intervention and post-intervention chart reviews using the data collection tool. A random selection of 100 pre-intervention charts from the practice was reviewed. Eligible charts for the review included all adolescent patients, ages 10 to 19 years, who had a BMI percentile greater than or equal to the 85th percentile. The chief complaint on file was not a factor. The first 100 charts reviewed were randomly selected from a list of patients who were seen in the department prior to the start date of the project. A table of random numbers was used for randomization of the charts whereby the first three numbers of the seven-digit medical record number were matched. Then, every third chart was reviewed until the goal of 100 was reached.

Demographic data included patient age and gender. BMI percentiles were reviewed for the 100 randomly selected charts along with whether the diagnosis of overweight and/or obesity was made, treatment initiated or a referral to the Center for Healthy Weight and Nutrition or other comparable facility was made. Descriptive statistics were performed via Microsoft Excel 2007 and SPSS 19 to compare the parameters of the pre-intervention and post-intervention groups. Ultimately, chi square was used to further compare and analyze the data collected pre-intervention and post-intervention. Chi square was the preferred statistical measurement of the three project objectives.

Characteristics of the Sample

The target sample for this project was a group of physicians and nurse practitioners in a pediatric gastroenterology clinic. The group consisted of sixteen doctors and five nurse practitioners at the beginning of the project. However, upon completion of the project there were twenty doctors and seven nurse practitioners. Four physicians and two nurse practitioners were hired into the practice prior to the start of the project. The newly hired providers were given the same information sheet as the others during separate meetings with the project leader. All the physicians are medical doctors and all the nurse practitioners have a master's degree in nursing. Only one of the nurse practitioners is pursuing their doctorate in nursing. The genders of the providers were nine female physicians, eleven male physicians, and seven female nurse practitioners.

Evaluation of the three objectives

The three project objectives were evaluated after data was collected from the post-intervention period (February 14, 2013 to March 21, 2013). The foundation for each objective was supported by a single education session between the project leader and the providers on February 13, 2013. An information sheet detailing the project and its objectives was given to each provider. Five of the seven nurse practitioners and two of the physicians were not in attendance at the meeting. Therefore, the project leader discussed the project with them individually and provided a copy of the same information sheet given to the others. All the providers verbalized understanding of the project. The laminated cards with the letters *BMI* % were posted on the walls above the computer terminals in the provider charting room in the clinic.

The evaluation phase of the project began after a six week intervention period. During the six weeks the project was being conducted, the project leader did not discuss the project with the

other providers. The project leader contacted Information Services at the hospital for a list of all the adolescents who were seen in the department who met the criteria for the project. Ultimately, 100 randomly selected charts were reviewed pre- and post-intervention. A table of random numbers was used to match the first three numbers of the seven-digit medical record number of the patient chart. Then, every third chart was selected for review.

Data were collected from multiple tabs within the EMR. The information was retrieved from tabs labeled: problem list, growth chart, progress note and after visit summary (AVS). Within the growth chart tab, one can obtain a BMI or BMI percentile. For each chart review, demographic data such as age and gender were retrieved. Additionally, BMI percentile, diagnosis of overweight and/or obesity, treatment initiation and referrals were reviewed and recorded on the data collection tool.

Initiation of treatment documentation was carefully scrutinized during each chart review. The project leader was interested in any treatment recommendations given, but particularly use of the dot phrase, *nosugaradded*, as it was the specific weight loss strategy being implemented and a referral for the obese adolescents for further evaluation. Primarily, data for initiation of care was found in the progress note and/or AVS. The same data was collected pre- and post-intervention with the exception of use of the dot phrase. This was not included in the first chart review. The statistical software used for the analysis was Microsoft Excel 2007 and SPSS 19. Results were reviewed by the project leader and evaluation team. This team included the capstone chair, committee members, mentor and the consulting statistician. Chi-square analysis was used to compare the baseline data and post-intervention date. The statistical significance threshold was set at 0.05.

Project Results

The purpose of the project was to improve how adolescent patients were identified as overweight and/or obese and to improve treatment recommendations in a large pediatric gastroenterology department. Each chart (n=200) met the criteria for evaluation of the project objectives. All twenty six providers were willing to participate in the project. However, two of the nurse practitioners primarily see only patients who are considered failure to thrive. Therefore, there were no charts available for review among those providers that met the criteria for the project.

Evaluation of the project was accomplished through pre-and post-intervention chart reviews. The pre-intervention sample consisted of 100 randomly selected patient charts from the providers within the department. The pre-intervention chart reviews totaled 100 for evaluation. The pre-intervention sample (n=100) had a mean age of 13.6 years with a standard deviation (SD) of 2.5 years. The minimum age was 10 years and the maximum age was 19 years. The gender distribution in the baseline group was 47% male and 53% female.

Inclusion criteria for the pre-intervention chart review included all adolescent patients, ages 10-19 years, whose BMI percentiles were greater than or equal to the 85th percentile and who had been seen in the department prior to the start of the project. Therefore, of the 100 charts reviewed pre-intervention, the providers identified overweight and/or obesity in 27 % of them. Among the 100 charts reviewed, 23 % met the criteria for overweight and 77 % for obesity. Of these 100 charts, the diagnosis for obesity was only annotated in the problem list or AVS in 22 %. Overweight was not identified in the problem list or AVS. Therefore, the 22 % annotation is representative of diagnosis for obesity and not overweight. Treatment recommendations were made in 20% of the 100 charts reviewed. Six percent of the obese adolescents were referred to the Center for Healthy Weight and Nutrition.

One hundred randomly selected charts were reviewed post-intervention. This sample (n=100) had a mean age of 13.4 years with an SD of 2.5 years. There were 42 males and 58 females. Of the 100 patients, 29% met the criteria for overweight and 71% for obesity. The BMI percentile was correctly identified in 37% of the charts. This 37% is representative of obesity and not overweight. Treatment was recommended in 25% of the charts for the obese patients. A referral to the Center for Healthy Weight and Nutrition or another comparable facility for the obese patients was made in 8% of the applicable cases where the adolescent met the criteria for obesity. The specific weight loss strategy or dot phrase of *nosugaradded* was used in 10% of the charts where obesity had been identified.

Specific criteria were tracked using the data collection sheet created in the Microsoft 2010 Word document. Once the data were collected and annotated, it was then imported into a Microsoft Excel 2007 spreadsheet for statistical analysis. SPSS 19 was also used to analyze the data and calculate the chi square.

The first objective was to increase proportionally the number of adolescent patients who were diagnosed with overweight and/or obesity. Chi square analysis did not demonstrate an improvement ($p > 0.160$). Chi square analysis did not reveal a significance ($p > 0.22$) for the second objective which was to increase the percentage of a specific weight loss strategy for adolescent patients who were diagnosed with overweight and/or obesity. Objective three aimed to increase the number of referrals to the Center for Healthy Weight and Nutrition or other comparable facility based on the diagnosis of obesity among adolescents. The chi square analysis was not statistically significant ($p > 0.88$). Therefore, none of the objectives were met for this practice change.

Congruence with the Theoretical Framework

The Transtheoretical Model of Change is about recognizing one has a problem and is willing to do something about it. The providers in this department embraced the project as it was anticipated they were not recognizing the adolescents who were either overweight or obese and therefore, not providing any treatment recommendations. The providers progressed from the pre-contemplation phase into the preparation and action phases without any difficulty. However, some of them could easily still be in the preparation phase as opposed to the action phase. Since awareness has been raised for the need for early diagnosis and treatment for overweight and/or obesity, the providers need time to consistently incorporate evaluation of the BMI percentile into their established routine during office visits. This project demonstrated that the providers still need time to fully commit to diagnosing overweight and/or obesity among all adolescents and not a small percentage as was evidenced in the pre- and post-intervention chart reviews. The providers cannot progress to the maintenance phase until they master the action phase. There was no termination phase as the project has the potential to influence future projects of a similar nature. A consideration would be to recommend that all overweight and/or obese adolescents avoid sugar-added beverages and diet beverages, as well. Some diet drinks replace sugar with sodium and that is not necessarily a nutritionally valid exchange.

Discussion

This project aimed to improve the diagnosis and treatment of overweight and/or obesity among the adolescent patients seen in a large pediatric gastroenterology department. The proposed project used established evidence-based clinical guidelines to identify adolescent patients with overweight and/or obesity and to encourage the providers in the department to make the diagnosis and appropriate treatment recommendations. Education of the providers on

the importance of early recognition and treatment was essential as the adolescent patients who are seen in this department benefit directly by having the diagnosis made during initial contact. By having the diagnosis of overweight and/or obesity made early, treatment can be initiated. Ultimately, this will minimize the risk of the adolescent patient developing some of the comorbid conditions associated with overweight and/or obesity, like T2DM and HTN.

A position statement on overweight and/or obesity has been defined. The standard of care is to encourage the utilization of evidence-based practice guidelines to improve the quality of patient care. Following these evidence-based practice guidelines will help reduce the financial burden of treating the disease by optimizing prevention and/or early diagnosis and treatment. By implementing treatment as soon as the health problem is identified, the disease is less likely to become chronic and require more treatment. This will lead to fewer health complications for the patient and a better, healthier quality of life. The findings from this project will be shared with the department and potentially, the Center for Healthy Weight and Nutrition.

This capstone project was conducted at a very fortuitous time as the media, both virtual and live, is full of reports on obesity. Recently, the American Medical Association (AMA) released a statement that obesity is now classified as a disease (Pollack, 2013). The AMA is hopeful that by categorizing obesity as a disease, early prevention and treatment can begin, therefore reducing the incidence of diabetes and cardiovascular disease. Ultimately, this would decrease the cost of care involved in the treatment of the co-morbid conditions associated with obesity. And, it could potentially lead to more coverage of prevention and treatment modalities for obesity.

One of the stories in the news that was of particular interest to this project leader was Mayor Michael Bloomberg of New York City and his quest to banish sugary drinks larger than 16 ounces from being sold at restaurants, theaters and food carts. This ordinance directly supported

Nationwide Children's Hospital's decision to not sell sugary-added beverages at the hospital and its offsite locations. However, Mayor Bloomberg's ordinance was overturned by the State Supreme Court in Manhattan, New York the day before it was to take effect (Grynbaum, 2013). The Mayor plans to appeal. This project leader was hopeful that this ordinance would set the precedent and that other city leaders in the country would follow suit.

Barriers to the project

The first barrier was in obtaining a list of charts for patients, ages 10 to 19 years and with a BMI percentile greater than or equal to the 85th percentile. The IS Team had never been asked to create a list with these parameters. The project leader first contacted them via a generic email address for their department available in Microsoft Outlook. Then, the project leader talked to one of the IS staff on the phone. However, the requested charts with the specific criteria were received in a timely manner once the IS Team understood the specified criteria and the purpose of the request. The IS Team specifically asked the project leader if this was an IRB project being conducted in the gastroenterology department for purposes of research publication. The IS Team prioritizes requests for records based on the purpose of the review.

Once the pre-intervention charts were received, accuracy in verifying the specific criteria was necessary. There were some charts that were not valid as the BMI percentile was not within the specified range. Some charts actually belonged to adolescent patients who were underweight and not with a BMI percentile greater than or equal to the 85th percentile. One likely explanation is that the medical record number closely resembled that of an adolescent who did have a BMI percentile in the specified range. Ultimately, 100 charts from the original list were reviewed based on the criteria of the project.

The challenge then became finding the necessary information within the EMR. The providers in the department all have different documenting styles. Therefore, each selected chart was meticulously scrutinized by searching the tabs within the EMR labeled problem list, reason for visit, progress note, growth chart and AVS. The problem list includes the date the diagnosis was made. This was helpful in determining when the GI provider had initiated the diagnosis of overweight and/or obesity. Likewise, the providers in the department all have dot phrases created for the specific needs of their patients. However, these are uniformly utilized on the after visit summary. Therefore, the chart reviews were completed efficiently once the project leader recognized the documentation needed to obtain the data for the project was found in the after visit summary.

Limitations of the project

The main limitation of this study was the short duration of the intervention phase. Ideally, three to four months, would have yielded better data with regard to an improvement in the diagnosis and treatment of overweight and/or obesity in the adolescent patients seen in the department. An extension in the intervention period would have allowed for more time to prove a statistical difference in the pre- and post-intervention chart reviews. Additionally, the placement of the laminated card one week after the information session may have impacted compliance. For those providers who are visual learners, they may have needed the card to be in place the day of the information session to remind them to check the BMI percentile and annotate within the EMR. There was a delay in getting the laminated cards from the print shop.

Another limitation was that not all the providers were present when the project leader first presented the project. One nurse practitioner was not available until two weeks into the project.

Likewise, the change in the number of providers before and after completion of the project was a limitation.

A threat to the validity of the project was the project leader's participation in the project. The project leader had the potential to deliberately document all the specific criteria prior to the pre-intervention chart review. And, the project leader had the potential to be chosen for both the pre- and post-intervention chart reviews. This would have influenced the data from both data collection sets. A consideration for the future would be to not include the project leader's charts in the reviews.

Implications for Practice. The goals of Nationwide Children's Hospital are to provide the highest quality of care during and after the treatment process, provide best outcomes during and after care, and provide for the long-term health care needs of children of all ages in the community. This project fully embraced these concepts. And, it paralleled the hospital's policy on not selling sugar-added beverages on-site to patients, families and employees. While there was no statistically significant increase in the number of adolescent patients who were diagnosed with overweight and/or obesity, the project did raise awareness for the need to address the BMI percentile and make treatment recommendations.

This project also allowed the project leader to further expand her clinical expertise. The project leader now has a clinic with the liver specialist specifically for adolescents whose BMI percentile is above the 85th percentile. Referrals to this clinic, which is called the Fatty Liver Clinic, are welcomed by all the other GI practitioners, other subspecialists within the hospital and pediatricians and family practitioners. The liver specialist and the project leader created the clinic after the project was completed based on the increasing number of referrals to the department for adolescents whose BMI percentile was greater than the 85th percentile and had

elevated liver enzymes and/or abnormal abdominal ultrasounds. While the physicians in the group are all board-certified gastroenterologists, there is only one that did an additional fellowship specifically for liver disease. Therefore, the hepatologist or liver specialist gets all the patients who are referred specifically for a liver problem. The liver specialist and project leader are planning to collaborate on other projects such as this in the future. Specifically, there is interest in evaluating the effectiveness of the *nosugaradded* weight loss strategy as quantified by weight loss, decrease in the BMI percentile and/ or a decrease in the liver enzymes. The liver specialist and project leader will continue to ask the other providers to review the BMI percentile with the adolescents and families. The two have discussed conducting another chart audit in six months to see how the providers are doing then as compared to the conclusion of this project. The two will need to verbally remind the other providers to address the BMI percentile daily. Hopefully, another educational session can be scheduled to reiterate the need for continuation of this project as weight does impact the care provided in the clinic if for no other reason that calculating the correct medication dose as all medications prescribed for children and adolescents is contingent upon weight and sometimes, height.

Additionally, this project gave the project leader a better appreciation and understanding of how difficult it is to get twenty physicians and seven nurse practitioners to implement change. Despite the simplicity of the project, the providers continued to demonstrate a problem-focused approach to the adolescent patients seen in the department. Asking the providers in this department to spend an additional couple of seconds to review the BMI percentile is not unreasonable. And, it could be that those couple of seconds spent reviewing the BMI percentile and the presenting GI complaint with the adolescent and his/her family are all that are needed for changes to occur that allow the adolescent to develop a more healthy lifestyle. Perception is

everything. The providers cannot assume that the adolescent and his/her family will be offended if the subject of overweight and/or obesity arises and likewise, the families cannot be offended because weight does impact certain GI diseases, particularly gastroesophageal reflux. With time, perhaps the providers will start incorporating a review of the adolescent patients' weight and/or BMI percentile into their daily routine. Likewise, with time, more referrals will be made to the Center for Healthy Weight and Nutrition or other comparable facility for treatment and management.

Certainly, the project leader has the support of the other nurse practitioners as several of them have expressed interest in going back to school to obtain a doctorate degree. Nurse practitioners are in a pivotal position in today's world as there is a need for more mid-level providers to fill the gap physicians have created as a result of specializing instead of working in primary care. This project leader sees nurse practitioners as change agents as many of them have such diverse educations and work backgrounds. This diversity and versatility allows the nurse practitioner to work in any specialty and apply that knowledge and experience to enhance and promote optimal health care. Change can often be met with resistance. However, as obesity is an epidemic both nationally and worldwide, it is imperative that all providers address weight concerns with patients as quickly as possible. Both the nurse practitioners and the physicians in this department are in a prime position to address and treat the obese adolescent patients that are seen regardless of the referring diagnosis.

A consideration for helping the providers to become more compliant with reviewing the BMI percentile is to have the nurse or patient care assistant (PCA) who rooms the patient to alert the adolescent and his/her family that the BMI percentile is not within the ideal range. Then, the nurse or PCA could inform the provider that the adolescent and his/her family are expecting

further feedback from them with regard to what having an abnormal BMI percentile means and what can be done to address it. The nurse or PCA could potentially give the adolescent and his/her family handouts which specifically detail what the BMI percentile is and how it is predictive of other diseases. The hospital uses *Helping Hands* pamphlets and these encompass a broad range of diseases and/or illnesses specific to each specialty. A *Helping Hands* for the Fatty Liver Clinic could be created by the hepatologist and project leader with the appropriate information to disseminate to adolescents and families written at a level that all could easily understand.

Often, the nurses are the first to interact with the patients and families, therefore, education about the BMI percentile could begin before the provider enters the room. Nurses ranked higher than physicians in providing excellent care according to a Gallup poll (Mendes, 2010). Nurses are perceived as having the clinical credentials and patient care experience to provide compassionate care. Nurses are perceived as more thoughtful and trustworthy, as well as being more empathetic. The nurses in this pediatric gastroenterology department are in a prime position to be the first to interact with the adolescent and his/her family and initiate education on what the BMI percentile is and how it impacts the overall health of the individual.

Implication for Doctorate of Nursing Practice (DNP). This project fully supported the essentials of the doctoral education for advance practice nurses. This project incorporated the DNP essentials, utilized scientific underpinning, and evidence-based practice to promote the health and well-being of the adolescent patients seen in a large pediatric gastroenterology department. As the world continues to embrace technology, it is imperative that health care providers do so, as well. This project incorporated quality improvement with advanced technology to evoke a practice change among nurse practitioners and physicians to further

augment the health care services provided to the targeted patient population. Following evidence-based research and clinical practice guidelines will promote healthy outcomes and help prevent chronic diseases. Health care costs will be reduced as a result of these measures.

This project afforded this project leader the opportunity to interact with advance practice nurses and nurses in a variety of clinical settings. This project leader is in the military and was able to use the knowledge gained from this project to collaborate with the nurses and one of the medical students to create an exercise and weight loss program for the members in the medial group who struggle to achieve a passing score on the annual fitness evaluation. The program is called *HOPE*. This acronym stands for hope in obtaining optimal physical fitness evaluations. The member is automatically disqualified from the fitness evaluation if the abdominal circumference is not within the ideal range for gender. The *HOPE* program incorporates simple and easy tips on how to eat healthy and how to exercise safely and effectively to achieve the desired results.

The project leader was able to spend some time with a nurse practitioner in an orthopedic clinic. Some of the patients seen in that clinic required knee replacement surgery. The weight of those patients is definitely a factor both in the pre-operative setting and the post-operative setting. This project leader was also able to observe how weight and nutrition impacts pregnancy. The project leader spent some time with a nurse midwife and was able to follow female patients in various stages of pregnancy. Overall, this project leader developed an expanded view of how important diet and exercise are in achieving and maintaining a healthy lifestyle.

Conclusion

Obesity is a national and global epidemic. BMI percentiles are a good way to assess overweight and/or obesity and nutritional status. However, diagnosis or recognition of an elevated BMI percentile is not enough. The earlier treatment can be initiated, the less likely the adolescent is to develop the comorbid diseases, such as HTN and T2DM, both of which are associated with overweight and/or obesity. The providers in the Pediatric Gastroenterology Department are able to refer directly to the Center for Healthy Weight and Nutrition once at-risk patients have been identified. If the Center for Healthy Weight and Nutrition is not a viable option, these same providers can facilitate a referral to a dietitian at one of the local hospitals and/or clinics.

As with any disease or illness, early detection or diagnosis is essential to successful treatment. Prevention, early diagnosis and treatment of adolescent obesity are necessary to ensure this vulnerable population transitions into adulthood as healthy as possible. This project represents an opportunity for all the providers in one sub-specialty pediatric clinic to identify and treat overweight and/or obesity. These providers have the advantage of daily access to not only a registered and licensed dietitian, but a clinic within the hospital that focuses exclusively on the treatment of overweight and/or obesity. These are two excellent incentives for evaluating every overweight and/or obese adolescent who is seen in the Pediatric Gastroenterology Department.

References

A Report on the BMI (2008). Retrieved from

http://www.odh.ohio.gov/ASSETS/.../BMI_Report2011.pdf

American Dietetic Association (2007). Pediatric weight management evidence-based nutrition practice guideline. Chicago, IL: ADA, 458 references.

American Heart Association (2006). Diet and lifestyle recommendations revision: A scientific statement from the AHA Nutrition Committee. *Circulation*. 114: **82-96**.

Published online before print June 19, 2006, doi: 10.1161/

Atlantis, E., Barnes, E.H. & Fiatarone Singh, M.H. (2006). Efficacy of exercise for treating overweight in children and adolescents: a systematic review. *International Journal of Obesity* (30), 1027–1040. doi:10.1038/sj.ijo.0803286; published online 14 March 2006.

Baker, S., Barlow, S., Cochran, W., Fuchs, G., Kish, W., Krebs, N., Strauss, R., Tershakovec, A., & Udall, J. (2005). Overweight in children and adolescents: a clinical report of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, *Journal of Pediatric Gastroenterology and Nutrition*, 40 (5), 553-43 (107 references).

Barlow, S. & the Expert Committee, (2007). Expert committee recommendations regarding prevention, assessment and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics*. 120, S164-S192.

Berger, E., (2007). Emergency departments shoulder challenges of providing care: Preserving dignity for the “super obese”. *Annals of Emergency Medicine*, 50(4):

443-45.

Centers for Disease Control (2001). Overweight and obesity: Childhood overweight and obesity. Retrieved from <http://www.cdc.gov/obesity/childhood/defining.html>

Chalasani, N., Younossi, Z., Lavine, J.E., Diehl, A.M., Brunt, E.M., Cusi, K., Charlton, M. & Sanyal, A.J. (2012). The diagnosis and management of non-alcoholic fatty liver disease: Practice guideline by the American Association for the study of liver diseases, American College of Gastroenterology, and the American Gastrocological Association. *Hepatology*, 55 (6).

Chittawatanarat,K., Pruenglampoo, S., Kongsawasdi, S, Chuatrakoon, B., Trakulhoon, V., Ungpinitpong, W. & Patumanond, J. (2011). The variations of body mass index and body fat in adult Thai people across the age spectrum measured by bioelectrical impedance analysis. *Clinical Interventions in Aging*, 6: 285-294. Available online at <http://dx.doi.org/10.2147/CIA.S25696>

Daniels, S.R., Arnett, D.K., Eckel, R.H., Gidding, S.S., Hayman, L.L., Kumanyika, S., Robinson, T.N., Scott, B.J., St Jeor, S., & Williams, C.L. (2005). Overweight in children and adolescents: pathophysiology, consequences, prevention and treatment. *April 19; 111 (15): 1999-2012 (103 references).*

Deckelbaum, R.J., & Williams, C.L.,(2001). Childhood obesity: The health issue. *Obesity Research* (9) 4:S239-S243.

DiNoia, J., Contento, I.R., & Prochaska, J.O. (2008). Computer-mediated intervention tailored on transtheoretical model stages and processes of change increases fruit and vegetable consumption among urban African-American adolescents. *American Journal of Health Promotion* 22(15):336-341.

- Dubois, L., Ohm, K.K., Girard, M., Tatone-Tokuda, F., Pe' russe, D., Hjelmberg, J., Rasmussen, F., Wright, M.J., Lichtenstein, P. & Martin, N.G. (2012). Genetic and environmental contributions to weight, height, and BMI from birth to 19 years of age: An international study of over 12,000 twin pairs. *PLoS One*. 7(2): e30153; published online February 8; doi:10.1371/journal.pone.0030153.
- Evers, K.E., Paiva, A.L., Johnson, J.L., Cummins, C.O., Prochaska, J.O., Prochaska, J. M., Padula, J. & Gokbayrak, N.S. (2012). Results of transtheoretical model-based Alcohol, tobacco, and other drug intervention in middle schools. *Addictive Behaviors* 37,1009-1018. April 19; 111 (15): 1999-2012 (103 references).
- F as in Fat Report (2010). Retrieved from <http://healthyamericans.org/reports/obesity/2010/>.
- Finkelstein, E.A., Trogden, J.G., & Cohen, J.W., (2009). Annual medical spending attributable to obesity: Payer-and service-specific estimates. *Health Affairs*, 28 (5): w822-w831.
- Flodmark, C.E., Marcus, C. & Britton, M. (2006). Interventions to prevent obesity in children and adolescents: a systematic review. *International Journal of Obesity* (30), 579- 589. doi:10.1038/sj.ijo.0803290
- Freedman, D.S., Khan, L.K., Dietz, W.H., Srinivasan, S.R., Berenson, G.S. (2001). Relationship of childhood obesity to coronary heart disease risk factors in adulthood: The Bogalusa Heart Study. *Pediatrics*, 108:712-718.
- Gale, S.M., Castracane, V.D., & Mantzoros, C.S., (2004). Energy homeostasis, obesity and eating disorders: Recent advances in endocrinology. *Journal of Nutrition*: 134:295-298.
- Goldberg, J. (2005). Obesity: The health debate and policy challenges. The

- Health Policy Institute of OH. Retrieved from <http://www.healthpolicyohio.org/>
- Grynbaum, M.M. (2013, Mar 11). Judge blocks New York city's limits on big sugary drinks. *The New York Times*. Retrieved from <http://www.nytimes.com/2013/03/12/nyregion/judge-invalidates-bloombergs-soda-ban.html?ref=opinion>
- He, M., Piche, L., Clarson, C., Callaghan, C., & Harris, S., (2010). Childhood overweight and obesity management: A national perspective of primary health care providers' views, practices, perceived barriers and needs. *Paediatric Child Health* 15 (7):419-426.
- Jackson, C. (1997). Initial and experimental stages of tobacco and alcohol use during late childhood: Relation to peer, parent and personal risk factors. *Addictive Behaviors*, 22, (5): 685-698.
- Kaufman, M. (2006). Role of adolescent development in the transition process. *Progress in Transplantatin*, 16 (4), 286-290.
- Koplan, J.P., Liverman, C.T., Kraak, V.I. & Wisham, S.L. (2007). How do we measure up? Committee on Progress in Preventing Childhood Obesity. Institute of Medicine of National Academies. The National Academies Press, Washington, D.C. Retrieved from http://books.nap.edu/openbook.php?record_id=11722
- Kottke, T.E., Wu, L.A., & Hoffman, R.A. (2003). Economic and psychological implications of the obesity epidemic. *Mayo Clinic Proceedings*, 78 (1).
- Livingstone, M.B.E. & Rennie, K.L. (2008). Added sugars and micronutrient dilution. *Obesity Reviews* 10 (1) 34-40. doi: 10.1111/j.1467-789X.2008.00563.x

- Maloney, A. (2011). Pediatric obesity: A review for the child psychiatrist. *Child and Adolescent Psychiatric Clinics of North America*, 19:2. doi:10.1016/j.pco.2011.06.005.
- Marder, W. & Chang, S., (2006). Childhood obesity: Costs, treatment patterns, disparities in care, and prevalent medical conditions. Thomson Medstat (Research brief). Retrieved from http://www.medstat.com/pdfs/childhood_obesity.pdf
- Mendes, E. (2010, Dec 10). In U.S., more than 8 in 10 rate nurses, doctors highly. Retrieved from <http://www.gallup.com/poll/145214/rate-nurses-doctors-highly.aspx>
- Mustelin, L., Silventoinen, K., Pietilainen, A., Rissanen, A., & Kaprio, J. (2009). Physical activity reduces the influence of genetic effects on BMI and waist circumference: a study in young adult twins. *International Journal of Obesity* (33), 29–36; doi:10.1038/ijo.2008.258; published online December 2, 2008.
- O'Brien, S., Holubkov, R., & Reis, E., (2004). Identification, evaluation, and management of obesity in an academic primary care center. *Pediatrics* (114) 2.
- Offerman, S.R., Rauchwerger, A.S., Nishijima, D.K., Ballard, D.W., Chettipally, U.K., Vinson, P.R., Reed, M.E., & Holmes, J.F. (2013). Use of an electronic medical record “dot phrase” data template for a prospective head injury study. *Western Journal of Emergency Medicine* 14 (2): 109-113; doi:10.5811/westjem.2012.11.13400.
- Ogden, C.L., Carroll, M.D., Curtin, L.R., McDowell, M.A. Tabak, C.J., & Flegal, K.M. (2006). Prevalence of overweight and obesity in the U.S., 1999-2004. *JAMA*. 295:1549-1555.
- Ogden, C.L., Flegal, K.M., Carroll, M.D. & Johnson, C.L., (2004). The continuing epidemic of obesity in the U.S. *JAMA*: 284 (13):1650-1. Retrieved from http://www.cdc.gov/PCD/issues/2004/jan/03_0012.htm

- Ogden, C.L., Flegal, K.M., Carroll, M.D., & Johnson, C.L., (2002). Prevalence and trends in overweight among U.S. children and adolescents, 1999-2000. *JAMA*, 288, 1728-1732.
- The Ohio Obesity Prevention Plan (2008). Retrieved from <http://www.healthyohioprogram.org/ASSETS/>
- Patel, A.I., Madsen, K.A., Maselli, J.H., Cabana, M.D., Stafford, R.S., & Hersh, A.L. (2010). Underdiagnosis of pediatric obesity during outpatient preventive care visits. *Academic Pediatrics*, 10: 405-409.
- Pollack, A. (2013, June 18). AMA recognizes obesity as a disease. *The New York Times*. Retrieved from <http://www.nytimes.com/2013/06/19/business/ama-recognizes-obesity-as-a-disease.html>
- Prochaska, J.O. (2008). Decision making in the transtheoretical model of behavior change. *Medical Decision Making*, 28:845. doi: 10.1177/0272989X08327068
- Prochaska, J.O. & Norcross, J.C. (1979). *Systems of Psychotherapy: A Transtheoretical Analysis*. Pacific Grove, CA: Brooks-Cole.
- Riley, M., Bass, N., Rosenthal, P., & Merriman, R., (2005). Underdiagnosis of pediatric obesity and underscreening for fatty liver disease and metabolic syndrome by pediatricians and pediatric subspecialists. *Journal of Pediatrics*, 147:839-12.
- Scottish Intercollegiate Guidelines Network [SIGN]. (2008). Critical Appraisal: Notes and Checklists. Retrieved from <http://www.sign.ac.uk/methodology/checklists.html>
- Sarkin, J.A., Johnson, S.S., Prochaska, J.O., & Prochaska, J.M. (2001). Applying the transtheoretical model to regulate moderate exercise in an overweight population: Validation of a stages of change measure. *Preventive Medicine*, 33, 462-469.

Siedentop, D. (2005). The Ohio Project. Retrieved from: <http://www.odh.gov>

Story, M.T., Neumark-Sztainer, D.R., Sherwood, N.E., Holt, K. Sofka, D., Trowbridge, F.L. & Barlow, S.E., (2002). Management of child and adolescent obesity: Attitudes, barriers, skills and training needs among health care professionals. *Pediatrics*, 110 (1), 210-214.

Strauss, R.S. (2000). Childhood obesity and self-esteem. *Pediatrics*, 105 (1): 1-5. Retrieved from <http://www.pediatrics.org/cgi/content/full/105/1/e15.full.html>

Trasande L & Chatterjee S. (2009). The impact of obesity on health service utilization and costs in childhood. *Obesity*, 17 (9): 1749-54.

Trasande L, Liu Y, & Fryer G, (2009). Effects of childhood obesity on hospital care and costs, 1999-2005. *Health Affairs*, 28 (4): w751-60.

U.S. Department of Health & Human Services, (2007). The surgeon general's call to action to prevent and decrease overweight and obesity. Retrieved from <http://www.surgeongeneral.gov/topics/obesity>

U.S. Department of Health & Human Services & US Department of Agriculture, (2005). Dietary guidelines for Americans, 2005, 6th edition, Washington, DC: U.S. Government Printing Office, January 2005.

U.S. Preventive Services Task Force (2010). Screening for obesity in children and adolescents: U.S. Preventive Services Task Force recommendations statement. *Pediatrics*, 125 (2):361-7.

- U.S. Preventive Services Task Force [USPSTF], 2003). Screening for obesity in adults. Retrieved from <http://www.ahrq.gov/clinic/3rduspstf/obesity/obeswhm>
- Wells, H.F. & Buzby, J.C. (2008). Dietary assessment of major trends in US food consumption, 1970-2005. Economic Research Service, U.S Dept of Agriculture. Retrieved from <http://www.ers.usda.gov/Publications/EIB33>
- Wethington, H., Sherry, B. & Polhamus, B., (2011). Physician practices related to use of BMI-for-age and counseling for childhood obesity prevention: A cross-sectional study. *BMC Family Practice*, 12:80.
- Wolford, L.G., (2008). Systematic review of childhood obesity prevention. *Journal of Pediatric Nursing*. 23 (1).
- World Gastroenterology Organisation, (2009). World Gastroenterology Organisation Global Guideline: Obesity. Munich (Germany): World Gastroenterology Organisation (WGO): 29 pages.
- World Health Organization, (2012). Obesity and overweight. Retrieved from <http://www.who.int/mediacentre/factsheets/fs311/en/>
- Zeizima, K., (2008, April 8). Increasing obesity requires new ambulance equipment. *The New York Times*. Retrieved from <http://www.nytimes.com/>

Appendix A. Letter of Support

Division of Gastroenterology, Hepatology, and Nutrition

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June 27, 2012

Anita Fouch, CNP
Nurse Practitioner
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Dear Ms. Fouch:

The Pediatric Gastroenterology Department is pleased to support your Capstone Proposal: A retrospective chart review to determine how well the providers are diagnosing overweight and obesity based on the body mass index (BMI) among adolescents and whether any treatment recommendations are made. We would welcome the opportunity to assist you in this project.

Please let me know how the clinical staff and management staff can assist you in this very important project.

Sincerely,

Carlo Di Lorenzo, MD
Chief, Pediatric Gastroenterology, Hepatology and Nutrition
Nationwide Children's Hospital
700 Children's Hospital
Columbus, OH 43205
614-722-3450

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INFORMATION FORM

Principal Investigator: Nathaniel, Alvita
Department: Nursing
Tracking Number: H-24436

Study Title:

Implementation and evaluation of a weight loss strategy in a pediatric gastroenterology clinic for adolescent patients with a BMI percentile in the overweight and/or obese category.

Co-Investigator: Fouch, Anita Carol

Contact Persons

In the event you experience any problems related to this project or if you have any questions, concerns, or complaints you should contact Dr. Grant Morrow, III in the IRB Office at 614-722-2784 or Dr. Richard Brill, the Chief Medical Officer at 614-722-4567.

Introduction

You have been asked to participate in this capstone project to meet the fulfillment of the Doctorate of Nursing Degree for Anita Carol Fouch, CNP through the School of Nursing at West Virginia University. This project will be conducted by Anita Carol Fouch, CNP in the Department of Pediatric Gastroenterology at Nationwide Children's Hospital in Columbus, OH.

Purposes of the Study

The purpose of this project is to improve how adolescent patients are identified as overweight and/or obese and to improve treatment recommendations in a large pediatric gastroenterology department. This project will be looking at how the sixteen doctors and five nurse practitioners in the Pediatric Gastroenterology Department at Nationwide Children's Hospital in Columbus, OH identify adolescents with unhealthy weights based on their BMI percentile and what treatment is recommended to help the adolescents reach a healthy weight.

Description of Procedures

You have been asked to participate in this capstone project to improve the diagnosis and treatment of overweight and/or obesity among adolescent patients in this large pediatric gastroenterology department. You have been asked to review the BMI percentile on every adolescent patient, ages 10 to 19 years, who is seen in the department. You have been asked to annotate the diagnosis of overweight and/or obesity, if applicable, either on the problem list, in the progress note or on the after visit summary (AVS) within the electronic medical record. You have also been asked to utilize the treatment

recommendation of no-sugar added beverages as a treatment strategy to help the overweight and/or obese adolescent achieve a healthy BMI percentile. For convenience and consistency of documentation of use, the treatment strategy will be accessible to you as an electronic dot phrase. You have been asked to refer patients who are identified as obese for further management. The capstone project will be evaluated with an electronic medical records review before and after six weeks of implementation.

Risks and Discomforts

There are no known or expected risks from participating in this project.

Alternatives

You do not have to participate in this project.

Benefits

You may not receive any direct benefit from this project. However, the knowledge gained from this project will benefit others; namely the adolescent patients who have been identified as being overweight and/or obese.

Financial Considerations

Any information about you that is obtained as a result of your participation in this project will be kept as confidential as legally possible. Records from this project may be subpoenaed by court order or may be inspected by federal regulatory authorities without your additional consent. In any publications that result from this project, neither your name nor any information from which you might be identified will be published without your consent. Additionally, it is possible review of the data collected may be used for quality assurance purposes. Information will only be shared with Dr. Alvita Nathaniel, the principal investigator, at West Virginia University. Both the hospital and university are subject to review by the Institutional Review Board (IRB) and/or the West Virginia University Office of Research Compliance and Office of Sponsored Programs. All the providers in this department will be asked to participate. All data collected will be aggregate and not individual.

Voluntary Participation

Participation in this project is voluntary. You are free to withdraw from this project at any time. Refusal to participate or withdraw will involve no penalty to you. In the event new information becomes available that may affect your willingness to participate in this project, information will be given to you so that you can make an informed decision about whether or not to continue your participation. You have been given the opportunity to ask questions about the project and you have received answers concerning areas you did not understand.

Initials

Date

Appendix C. BMI % Card

BMI %

Appendix D: Data Collection Form.

Chart #	Provider #	BMI % Correctly identified	Dx made on problem list or on AVS	Tx made; use of the dot phrase	Referral made to the Center or other
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2					
3					
4					
5					
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100					

Appendix E: Bar Graphs with Comparison.

Pre-intervention chart review.

Post-intervention chart review.

Appendix F: Timeline.

Capstone Presentation: August 2012

IRB Process Initiated: September 2012

IRB Approval NCH: October 2012

Ongoing IRB Process at WVU: November 2012-February 2013

IRB Approval from WVU: February 2013

Education Session for Providers: February 2013

Project Started: February 2013

Project Completed: March 2013

Project Evaluation and Analysis: April and May 2013

Finalization of Project Paper: May 2013-July 2013

Capstone Presentation: July 2013

Graduation: August 2013