

CHILDHOOD OBESITY: THE PRIMARY CARE PROVIDER'S ROLE IN RECOGNITION,
DIAGNOSIS, AND MANAGEMENT

By

Amy N. Herman, BSN, RN

University of Kansas School of Nursing

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Wanda Blaser Bonnel, Ph.D, RN, GNP-BC, ANEF

Faculty Project Committee, Chair

Moya Peterson, Ph.D., RN, CPNP, APRN

Faculty Project Committee, Co-Chair

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The DNP Project committee for Amy Herman certifies that this is the approved version of the following DNP Project:

**Childhood Obesity: The Primary Care Provider's Role in
Recognition, Diagnosis, and Management**

Wanda Blaser Bonnel, Ph.D, RN, GNP-BC, ANEF

Chair

Moya Peterson, Ph.D., RN, CPNP, APRN

Co-Chair

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Abstract

The number of obese children and adolescents has skyrocketed in recent years. As of 2012, one-third of American youth were considered to be overweight and obese (Centers for Disease Control [CDC], 2014). Primary care providers have a vital role in the recognition and management of childhood obesity. However, studies demonstrate that primary care providers do not consistently adhere to recommended guidelines. Primary care providers must take action and make changes to maximize outcomes and reverse current trends. The purpose of this quality improvement project was to increase the recognition, diagnosis and management of overweight/obese children in primary care by increasing provider awareness of current practice guidelines set forth by the American Academy of Pediatrics (AAP) Expert Committee Recommendations. The following question was developed to address this issue: What is the status of guideline adherence (recognition, diagnosis, and management) for overweight/obese children in the primary care setting and how can any areas of practice weakness be improved? A chart review was utilized based on AAP (2007) recommendations to determine rates of body mass index (BMI) percentile documentation, appropriate ICD-10 weight diagnosis, and documentation of weight-based counseling for all patients seen for well-child visits with BMI greater than or equal to the 85th percentile. Audit results demonstrated both provider strengths and challenges in their documentation. A guided discussion session was held to share audit results and plan for practice improvement. This discussion addressed issues and suggested future plans including electronic health record improvements, enhanced patient education resources, and ongoing quality improvement strategies. A planning summary was disseminated back to the providers for their reference. This project took place in family practice outpatient care setting.

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Childhood Obesity: The Primary Care Provider's Role in Recognition, Diagnosis, and Management

The number of obese children and adolescents has skyrocketed in recent years. As of 2012, one-third of American youth were considered to be overweight and obese (Centers for Disease Control [CDC], 2014). Obesity in childhood carries with it both immediate health risks such as hyperlipidemia, hypertension, bone or joint problems, and poor self-esteem, as well as long-term health risks including heart disease, stroke, type 2 diabetes, cancer and osteoarthritis. Due to the immensity of this problem, in 2007 the American Academy of Pediatrics (AAP) released practice guidelines to aid providers in the recognition, prevention, and management of this disease (Barlow & Expert Committee, 2007).

These new recommendations outlined processes for identification, assessment, prevention, and interventions for treatment of childhood overweight and obesity (Barlow & Expert Committee, 2007). To identify those that are overweight or obese, BMI and BMI percentile should be calculated and plotted at every well-child visit. Normal weight was defined as BMI in the 5th to 84th percentile, overweight as BMI in the 85th to 94th percentile, and obesity as at or above the 95th percentile (Barlow, 2007). Proper diagnosis of weight class allows the provider to determine assessment and intervention criteria based on a stepwise algorithm. In addition, weight based counseling that focuses on eating five servings of fruits and vegetables daily, two hours or less of screen time per day, one hour of physical activity daily, and zero sugary beverages (5-2-1-0) is recommended for all patients (AAP Institute for Healthy Weight [AAP ICHW], 2015; Barlow, 2007).

Problem Statement

Primary care providers have a vital role in the recognition and treatment of childhood obesity. However, a study by Chevprakumar et al. (2014) revealed that despite 93% of providers reporting that they consistently chart BMI, chart review revealed documentation rates of only 79%. Additionally, diagnoses were documented for only 22% of overweight patients and 56% of obese patients (Chevprakumar et al., 2014). A systematic review by Looney et al. (2011) found that prevalence of BMI calculations ranged from as low as 0% to as high as 64%. Additionally, use of BMI for age growth charts was even lower, ranging from 4.3% to 33% (Looney et al., 2011). Furthermore, a study by Reyes (2015) determined that only 20% of overweight patients received adequate diagnosis and counseling. By not employing the recommended guidelines, many children may go undiagnosed and without treatment. Because identifying the problem is the first step in curing the disease, it is vital that efforts are made to increase the ability and willingness of primary care providers to address children with weight issues.

Purpose Statement

Due to the grave consequences of this disease if left untreated, a shift in the current paradigm must occur. Primary care providers must take action and make changes to maximize outcomes and reverse current trends. The purpose of this project was to increase the recognition, diagnosis and management of overweight/obese children in primary care by increasing provider awareness of current practice weakness and participating in improvement planning. Recommendations set forth by the American Academy of Pediatrics (AAP) served as guidelines for this project. The following question was developed to address this issue: What is the status of guideline adherence (recognition, diagnosis, and management) for overweight/obese children in the primary care setting and how can any areas of practice weakness be improved?

Concepts/Variables Named and Defined

Key concepts and variables to this project included overweight/obesity, education, recognition, diagnosis, and management. The concept of overweight/obesity was central to this project. For the purposes of this project, overweight/obesity was theoretically defined as weighing more than is desired for optimal health and functioning. Operationally, overweight was defined as having a body mass index (BMI) above the 85th percentile but below the 95th percentile, and obese is defined as having a BMI at or above the 95th percentile (Barlow & Expert Committee, 2007).

Concepts evaluated in this project included recognition, diagnosis, and management of pediatric obesity. Recognition was theoretically defined as the ability to perceive something as being true (Collins English Dictionary, 2013). Specifically for this project recognition referred to the provider's ability to recognize a child as being overweight/obese based on nationally adopted standards of evaluation. The concept of diagnosis was theoretically defined as identification and documentation of a disease process based on its signs and symptoms (Merriam Webster Dictionary). The concept of management was theoretically defined as activities, such as providing education, that seek to improve health outcomes of a person with chronic disease (American Academy of Family Physicians [AAFP], 2016).

The concepts of recognition, diagnosis, and management of pediatric obesity were evaluated utilizing chart review. Recognition was evaluated by tracking the rate of BMI percentile documentation for all well-child visits. Rates of appropriate diagnosis were evaluated by tracking the ICD 10 codes (E66.0-E66.9) for the appropriate weight based diagnosis of overweight or obese. Management was evaluated by tracking documentation by the provider that weight-based counseling was provided. Weight based counseling included but was not limited to the 5-2-1-0 message which encourages five servings of fruits and vegetables daily, limiting

screen time to two hours a day, getting one hour of physical activity daily, and zero sugary drinks.

Project Importance

According to the World Health Organization (2015), childhood obesity is among the most serious public health crises of the 21st century. In fact, from 1970 to 2010, rates of childhood obesity in the United States nearly tripled (CDC, 2014). Research has shown that children and adolescents who are overweight are more likely to be overweight or obese adults (CDC, 2014). Because of the wide range of health-related consequences of obesity in adults, early prevention should be a top priority. If current trends continue, the Surgeon General warns that this generation of youth may be the first to have a shorter life expectancy than their parents (American Heart Association [AHA], 2014).

Furthermore, obesity has a direct effect on healthcare costs. It is estimated that 190 billion dollars was spent on obesity-related healthcare in United States in 2005 (Harvard, 2015). However, early proactive treatment can decrease morbidity and prevent costly complications associated with obesity, and primary care providers are poised to play a significant role. In fact, a study by Klein et al. (2010) found that physicians who had exposure to obesity education and were more familiar with the recommended guidelines and were more likely to utilize these guidelines in practice. By leading change through improved practice, providers can have a direct impact on the prevention and treatment of childhood obesity in the primary care setting.

Current Literature

Currently, the research on childhood obesity is extensive. However, when the search is narrowed to include only research based on interventions to improve provider recognition and management of childhood overweight and obesity in primary care, the search is much more

limited. The current literature database lacks studies that provide longitudinal analysis of such interventions. In addition, currently there is a lack of level one research with the majority of research consisting of quasi-experimental, pre/post implementation chart review. However, the research that does exist supports the efficacy of provider focused interventions to improve the recognition, diagnosis, and education of children who are overweight or obese. The current research will be summarized, analyzed and reviewed in further detail in the following section.

Literature Review and Synthesis

Review Methods and Organization

A literature search was conducted using CINAHL, PubMed, and Google Scholar databases. Key words searched include “childhood obesity,” “improvement,” “provider,” “recognition,” “BMI” and “primary care.” These words were used both independently and in concert. The search was limited to articles written in the English language, published between 2010 and 2015, published in academic journals, research articles, and using child subjects. To be included, the studies had to be primary research that were based in a primary care setting and included a provider based intervention for improving recognition and management of childhood obesity.

The methods utilized for this review have strengths as well as weaknesses. The use of only two databases could be considered a weakness of this search method, as important studies could have been inadvertently left out. Use of a single reviewer could also be considered a weakness, as it could have introduced bias. Limiting results to those from peer-reviewed academic journals can be considered a strength of this method.

Various methods to increase recognition, management and outcomes related to childhood obesity were utilized in the reviewed studies. Four studies utilized computer-based interventions

such as embedded clinical-decision making tools, point of care alerts, and electronic medical record (EMR) customization, to increase provider adherence to practice protocols and guidelines. Four of the reviewed studies utilized physician education programs to determine their effect on adherence to the recommended guidelines. Finally, three of the studies, utilized an office based protocol and decision making tree to not only increase adherence to guidelines for recognition of childhood obesity, but also provided a step-wise approach for management and follow-up. Due to the differences in the interventions utilized, this review will be organized by intervention type.

Article Critique and Synthesis

Computer-based intervention. Four of the reviewed studies utilized a computer-based approach to increasing recognition of childhood obesity. The main outcomes for these studies included BMI utilization rate, obesity-related risk factor assessment, diagnosis of obese or overweight, counseling interventions, and completion of growth charts. One study tracked ICD-9 codes for obesity/overweight, and ICD-9 codes for counseling pre- and post-intervention (Coleman et al., 2012). A similar study also tracked ICD-9 codes for obesity/overweight but provided a control group for comparison (Ayash, et al., 2013). Both of these studies utilized EMRs that contained decision-making support and prompts based on clinical guideline recommendations. The final two studies compared BMI documentation rates and obesity/overweight diagnoses rates after EMR implementation, to rates during periods when only written documentation was utilized (Sauvinon et al., 2012; Young, 2015). The EMR programs incorporated recommended guidelines to provide prompts, reminders, and links to patient education. In addition, the program used by Young (2015) incorporated risk assessment and treatment plans appropriate for the patient's BMI percentile and diagnosis.

All four studies revealed clinically significant increases in rates of obesity/overweight diagnoses post EMR implementation when compared with pre-implementation rates and with control groups (Ayash et al., 2013; Coleman et al., 2010; Sauvinon et al., 2012; Young, 2015). In addition, 43 to 49% increases in weight related counseling after EMR implementation was evidenced across the two studies that tracked this outcome (Coleman et al., 2010; Sauvinon et al., 2012). Furthermore, BMI documentation rates and utilization of BMI growth charts increased 62% and 94% respectively after utilization of EMR, compared to rates of documentation when only written records were employed. (Sauvinon et al., 2012). Furthermore the study by Young (2015) showed increases of 10% for both diagnosis and treatment compared to pre-intervention rates. While the study by Coleman et al. (2010) did not track BMI directly, the EMR program calculated BMI from documented height and weight. Rates of height and weight documentation for this study increased from 66% prior to implementation to 94% post-implementation (Coleman et al., 2010).

Despite these promising findings, it is important to note limitations of the selected studies. The study by Sauvinon et al. (2012) which compared EMR to written record, was small (n=77) and took place in a small, private-practice setting which could potentially limit the generalizability of the findings. Both the study by Coleman et al. (2010) and Ayash et al. (2013) were limited by the fact that they relied heavily on ICD9 codes and did not complete full medical record reviews, which could underestimate the effects of the intervention. Additionally, all four studies failed to control effectively for outside variables that could affect rates of obesity recognition and therefore, limited the ability to determine a causative relationship between EMR based interventions and increased recognition of childhood obesity (Ayash et al., 2013; Coleman

et al., 2010; Sauvinon et al., 2012; Young, 2015). It is also important to note that Young (2015) witnessed decreased motivation and guideline adherence as time passed.

Physician education programs. Four of the included studies implemented physician based education and quality improvement (QI) interventions to increase recognition and treatment of childhood obesity. Three of the studies measured outcomes of BMI documentation, diagnosis and counseling (John et al., 2014; Shaikh, Nettiksimmons, Joseph, Tancredi, & Romano, 2014; Young et al., 2010). The fourth study measured outcomes of BMI percentile documentation and diagnosis but did not include the outcome of counseling (Gance-Cleveland, Aldrich, Schmiede, & Tyler, 2016). All four studies experienced statistically significant increases in their measured outcomes (Gance-Cleveland et al., 2016; John et al., 2014; Shaikh et al., 2014; Young et al., 2010).

Interventions were similar between studies with all four involving a learning collaborative (LC) focused on recommended guidelines and standards of care for the diagnosis, evaluation and treatment of childhood obesity. The LCs also included education on motivational interviewing, tips for reorganizing practice to enhance weight status assessment and counseling, education on healthcare systems support, and planning sessions for practice change (Gance-Cleveland et al., 2016; John et al., 2014; Shaikh et al., 2014; Young et al., 2010). In three of the studies the LCs took place over nine months (John et al., 2014; Shaikh et al., 2014; Young et al., 2010). In the fourth study, by Gance-Cleveland et al. (2016), the LC took place over 12 months. In all of the studies, the participating practices then selected practice changes based on the recommendations.

Some differences did exist. Young et al. (2010) provided the bulk of education in a two day seminar followed by monthly conference calls and site visits over the remainder of the nine

months, while Gance-Cleveland et al. (2016), John et al. (2014) and Shaikh et al. (2014) utilized virtual or web-based education at least monthly for the entirety study program. In addition, the study by Gance-Cleveland et al. (2016) utilized two intervention groups. In one group the sole intervention was the virtual learning collaborative and in the second group the providers participated in the virtual collaborative as well as had training in HeartSmart Kids decision support technology (Gance-Cleveland et al., 2016). It is important to note that in the study by Gance-Cleveland, which involved two intervention groups, both groups showed significant increases in diagnosis and counseling. However, there was no statistical significance between the two intervention groups for these outcomes.

Despite the differences, all programs yielded increased BMI, BMI percentile documentation and diagnosis. In addition, statistically significant increases in rates of counseling were seen in the three studies that measured that specific outcome. Specifically, Young et al. (2010) witnessed an increase in BMI documentation of 55% pre-intervention, to 97% post-LC and Gance-Cleveland et al.(2016) witnessed a 21.3% increase in BMI percentile documentation and an increase in obesity diagnosis by 15.2% in the LC only group and by 35% in the LC plus decision support group. Furthermore, weight-based counseling was increased by as much as 50% post intervention (John et al., 2014).

Strengths and weakness of these studies exist and should be discussed. Strengths of all studies incorporated the inclusion of not only physicians but also nurse practitioners and other mid-level providers in the intervention. Additionally, all studies utilized multiple clinic sites and reviewed a large number of charts. Young et al. (2010) took place in 18 different primary care settings and included 1014 chart audits. Gance-Cleveland et al. (2016) included 33 different providers and 612 charts. John et al. (2014) included 29 practice sites, 752 baseline chart audits,

and a mean of 318 chart audits submitted monthly. Furthermore, the study by John et al. (2014) took place in practice sites across seven different states. The study by Shaikh et al. (2014) was the smallest of the studies, involving seven clinics and only 144 chart reviews. Another key strength of all studies was consistency in the findings among the studies and with other key literature. Limitations of studies include the use of provider supplied audits which could introduce bias and alter results of the study (Gance-Cleveland et al., 2016; John et al., 2014; Shaikh et al., 2014; Young et al., 2010). Additionally, in all studies providers were self-selected for the study (Gance-Cleveland et al., 2016; John et al., 2014; Shaikh et al., 2014; Young et al., 2010). Furthermore, in three of the studies the participants received continuing education credit, which could affect motivation of participants and skew results (Gance-Cleveland et al., 2016; Young et al., 2010; John et al., 2014). Lastly, the study by Shaikh et al. (2014) may lack generalizability due to the fact that it was only conducted in seven rural health clinics.

Clinic-based obesity programs. The remaining three studies reviewed, involved introducing a clinic-based protocol program to help guide providers in the recognition, management, and treatment of these individuals. These programs provided algorithms for treatment, educational posters, documentation forms, and motivational interviewing emphasis. All of these programs focused not only on increasing recognition of childhood obesity, but also on increasing adherence to recommended guidelines for managing this chronic health problem. Increased adherence to recommended guidelines was the primary outcome for these studies with all of these studies reporting increased rates of adherence to the recommended guidelines (Cygan, Baldwin, Chehab, Rodriguez, & Zink, 2014; Dorsey, Mauldon, Magraw, Valka, & Krumholz, 2010; Gibson, 2016).

These three studies followed clinical guideline adherence based outcomes such as BMI documentation, screening, counseling, and diagnosis. Cygan et al. (2014) assessed the effectiveness of the implementation of a weight management protocol on clinical guideline adherence. The program, titled Six to Success is based on the Chronic Care Model and provided clinicians with a specific step by step decision tree for the identification, assessment, and prevention of obesity based on BMI classification. Dorsey et al. (2010) introduced a QI program that provided an algorithm of care based on BMI percentile, provided an encounter form to be filled out for each patient who met BMI criteria, and utilized team QI meetings for provider education. Gibson (2016) implemented the *Lets GO! 5210 Childhood Obesity Prevention Resources Toolkit for Healthcare Professionals* in an attempt to improve care and fill identified gaps in care. All programs were found to have a significant impact on diagnosis, lifestyle assessment, physical examination, and prevention of childhood obesity (Cygan et al., 2014, Dorsey et al., 2010; Gibson, 2016). In fact, when comparing early adopters of the program to late adopters, Dorsey et al. (2010) found that early adopters more frequently recorded BMI (91% vs 34%), diagnosis (89% vs 51%), and counseling (82% vs 48%) compared to late adopters of the program. It is important to address however, that Dorsey et al. (2010) witnessed a drop in both BMI measurements (91% to 27%) and risk factor identification (72% to 23%) from the first to the fifth visits.

One strength of all studies is that they all included multi-level providers such as physicians as well as nurse practitioners. Furthermore, a strength of the study by Dorsey et al. (2010) is that charts were randomly selected for audit which helps to reduce bias. While both studies by Cygan et al. (2014) and Dorsey et al. (2010) employed a large number of chart audits (n=859 and n=396) which could be viewed as a strength of this study, both also only took place

in single clinics and involved a small number of providers who employed the intervention (n=9 for both studies) which limits the generalizability of findings to the larger population. The study by Gibson (2016) was smaller, with only 74 pre-intervention chart reviews and 60 post-intervention reviews. Additional limitations include lack of control group, inability to prove causative relationship, and that all studies relied on chart audits and documentation rather than direct observations of behavior, which could skew results if providers performed the task but forgot to document it. In addition, while Cygan et al. (2014) did employ a private investigator (PI) for chart audits, they were not able to be blinded as to which charts were pre-and post-intervention. Finally, both studies by Cygan et al. (2014) and Gibson (2016) lack longitudinal data and therefore sustainability of results cannot be inferred.

Literature Summary and Results

To summarize, review of the literature revealed three types of interventions used to enforce protocols and increase adherence to national guidelines of care. EMR based point-of-care alert interventions that embed protocols into the electronic documentation system displayed positive outcomes, having the potential to increase recognition (BMI documentation), diagnosis, and counseling for these patients. Learning Collaboratives and physician education on current recommendations were also utilized and showed potential for improving adherence to guidelines of treatment, increasing recognition of obesity (BMI documentation) and utilization of weight-based counseling interventions. This intervention type provided clinicians with the education to develop practice specific protocols that aligned with national standards of care and were therefore, adaptive to practice type. Likewise, clinic based obesity programs and tool-kits also showed promise for improving provider adherence to guidelines, and can increase BMI

documentation, risk factor analysis, improve screening of comorbidities, and improve counseling and follow-up appointments.

A previous systematic review by Jacobsen and Gance-Cleveland (2011) corroborated these findings. This review detailed interventions used by primary care providers to aid in the recognition, prevention, and management of childhood obesity. Interventions were similar to those presented in the current review, including educational materials and decision support for providers, computer information systems based interventions, and delivery system design. Jacobsen and Gance-Cleveland (2011) found that inclusion of office-based tools was a successful reminder for providers that improved adherence to recommendations. Moreover, it was found that provider interventions are a safe, cost-effective way to improve the assessment and management of overweight and obese children (Jacobsen & Gance-Cleveland, 2011).

The evidence appears to be consistently in favor of primary care based interventions that align with practice guidelines. Little variation in result findings is evidenced. In response to the PICO question, based on the review above, the evidence suggests that clinic based protocols, whether they are EMR based, developed via LC, or delivered via tool-kit and/or as a clinic-based program, have the potential to improve rates of childhood obesity recognition, management, and treatment in primary care.

However, gaps in the current literature do exist and deserve to be discussed. First, the current literature database lacks studies that provide longitudinal analysis of such interventions. This is important, because the few studies reviewed that did provide a longitudinal analysis showed a decrease in effectiveness overtime. More studies of this type are needed to determine the long-term efficacy of these interventions. In addition, currently there is a lack of level one research. Very few randomized-controlled trials exist on this topic. This is most likely due to the

ethical consequences of treating one group of children per recommended guidelines and treating other children in ways that could be considered subpar by expert committee recommendations. Because of this, the majority of research consists of quasi-experimental, pre/post implementation chart review. Furthermore, while there is a lot of research concerning the topic of childhood obesity, there are relatively few studies that focus on primary care based interventions, and few that determine the actual effects of these interventions on the child's BMI. Similarly, more research on barriers to recognition, management, and treatment in primary care would add to the knowledge base and increase the likelihood of a sustainable intervention.

Theoretical Framework

Successful implementation of change depends largely on how the change is perceived (Daly, Chang, Hancock, and Crooks, 2004). In order for change to be successful both the leader and followers must be on board and be motivated. Therefore, motivators for change, barriers to change, and resistance to change must be addressed. Because Lewin's Change Model provides an understanding of this process, it was used as the theoretical framework to guide this project.

Three Major Concepts

The three major concepts of driving forces, restraining forces and equilibrium are central to Lewin's Model. Driving forces can be defined as forces that facilitate or push for change (Johnson & Christensen, 2014). Restraining forces can be defined as forces that resist change and thereby support that status quo (Johnson & Christensen, 2014). Equilibrium is defined as a state in which the driving forces equal the restraining forces (Johnson & Christensen, 2014). These concepts must be considered in the context of this project.

Driving forces. Immensity of the problem, health consequences, impact on healthcare costs, improved outcomes with improved provider recognition, and the public's perception of the

primary care provider as a valued healthcare advisor were all considered driving forces and motivators of change for this project.

From 1970 to 2010, rates of childhood obesity in the United States nearly tripled (CDC, 2014). As rates of childhood obesity continue to climb so do the rates of diseases once thought to primarily effect adults, such as diabetes, hypertension, and hyperlipidemia (CDC, 2014). In addition, obesity has a direct impact on healthcare costs (Harvard, 2015). Because childhood obesity is an important early risk factor for adult mortality and morbidity, the Surgeon General warns that this generation of youth may be the first to have a shorter life expectancy than their parents (American Heart Association [AHA], 2014).

Additionally, as obesity and overweight have become a societal norm, perceptions of healthy, overweight, and obese have become skewed. A study by Hernandez, Cheng, and Serwintz (2010) found that among overweight preschoolers 89.6% of parents misclassified their child's weight as being healthy. Primary care providers are considered the most valued advisor on child weight (Hernandez et al., 2010). In fact, studies have found that provider interventions are a safe, cost-effective way to improve the assessment and management of overweight and obese children (Jacobsen & Gance-Cleveland, 2011).

Restraining forces. Many studies have evaluated the perceived barriers to the primary care provider's recognition, diagnosis, and education of childhood obesity in practice. A study by Findholt, Davis, and Michael, 2013 listed providers' perception of lack of effect, sensitivity of the topic, and limited resources for referrals as barriers to care of the overweight/obese child. Additional barriers included limited appointment time and inadequate training (Gibson, 2016). These barriers can all be considered restraining forces. These perceived barriers must be broken down and the resisting forces lessened for change to take place.

Three Stages

Lewin's Model outlines three stages of change. The first of these stages is Unfreezing, in which the people or organization prepare for change (Grossman & Valiga, 2016). In the second stage, titled Moving, people have accepted that there is a need for change and implementation of change is initiated (Grossman & Valiga, 2016). The third stage is Freezing, in which the focus is to maintain the change and establish it as the new norm or status quo (Grossman & Valiga, 2016).

Unfreezing. Change can be made possible by increasing the driving forces, decreasing the restraining forces, or through a combination of these to strategies (Shirey, 2013). To increase driving forces, current recommendations and tips for implementing them were reviewed during a provider discussion session. A pre-intervention chart review also detailed the level of provider adherence to recommended guidelines for childhood obesity/overweight recognition, diagnosis and education. The results of the chart review were disseminated to providers in an attempt to drive the need for change.

To reduce restraining forces, a discussion session detailing current practice trends based on the chart review results was held with provider and other clinic staff. Current AAP recommendations as well as a list of helpful resources and office based toolkits was shared in order to facilitate the development of a plan for improvement in practice. By including providers in the development of this plan it was hoped that it would increase buy-in and thereby further reduce restraining forces.

Moving. The stage of Moving is the stage in which change occurs (Shirey, 2013). For purposes of this project this stage can be described as increased adherence to recommended guidelines. Outcomes of change for this project included a plan for practice improvement that

would lead to increased rates of BMI percentile documentation, increased use of appropriate weight based ICD-10 diagnosis, and increased documentation that weight-based counseling was provided for overweight/obese children. This plan was disseminated back to providers. Future chart reviews outside of this project will be able to determine whether a change in practice occurred.

Refreezing. The stage of refreezing is outside the scope of this project. However, it is hoped that the plan developed by the providers will lead to a long-term change in practice. Tips for long-term guideline adherence were provided during the discussion session and included monthly chart reviews and praise or recognition during staff meetings for providers that regularly adhere to guidelines. A sample chart review tool was provided in the list of resources given to providers during the discussion session.

Author's Assumptions

Based on the current literature review, the author made the following assumptions. First, the author assumed that adherence to practice guidelines would improve rates of recognition, diagnosis, and education provided to overweight/obese children in primary care. Secondly, the author assumed that guideline adherence was currently suboptimal. Lastly the author assumed that guideline adherence could be improved through increasing provider awareness of current practice trends, increasing awareness of practice guidelines, and by involving providers in developing a plan for practice improvement.

Methods

Project Design

This project was designed as a Quality Improvement project with two phases. In phase one of the project, a chart review was conducted to determine current practice trends.

Convenience sampling was used for this project. All charts of patients ages 2-18, seen for a Well-Child exam between March 1, 2017 and June 30, 2017, were reviewed. Those charts of patients identified as being overweight or obese based on a body mass index (BMI) greater than the 85th and 95th percentiles respectively were further reviewed and included in the results data. A total of 30 charts that fit the overweight and obesity criteria described above were identified. Each of these 30 charts was reviewed to determine whether BMI, BMI percentile, ICD-10 diagnosis and weight based counseling were documented for the appointment. At the end of the chart review rates of documentation for each variable were tallied. Phase two involved dissemination of these results to providers during a guided discussion session. The guided discussion session with providers is further described below.

Project Sample

A total of 30 charts were identified as meeting the criteria of overweight or obese and were further reviewed as described above as part of phase one. This project took place in a rural family practice setting. The practice where the project took place operated as a Medical Home Designee. As part of phase two, all providers of children ages 2-18 in the clinic were invited to participate in the guided discussion session. The clinic manager, who was key in helping to organize this meeting, also invited the providers' nurses, social workers, care-coordinators, and administrators of the clinic to participate.

Data Collection

Data collection tool. For data collection purposes in phase one of this project, a chart review tool was developed by the project director. The tool was based on the AAP Expert Committee Recommendations (2007) for childhood obesity in primary care and reviewed by two expert clinicians.

The tool (Appendix A) included the following data: BMI (Is it documented? What is it? Is it correct?), BMI percentile (Is it documented? What is it? Is it correct?), ICD-10 code (Is it documented? What is it? Is it correct?).

The tool also included demographic factors of age, gender, height, and weight. This demographic data allowed the data collector to calculate a BMI and BMI percentile if the provider failed to document either in the chart. This tool is provided in Appendix A.

Charts were also reviewed for whether weight-based counseling was documented for each category outlined by the 5-2-1-0 criteria discussed above. This criteria was designated by a yes/no format. The four categories included in the 5-2-1-0 criteria include eating five servings of fruits and vegetables daily, limiting screen time to two hours a day, getting one hour of physical activity daily, and zero sugary drinks. An “other” category was also included to account for any other weight based counseling topics that may have been discussed but didn’t fall under the above categories.

Data collection procedure. A search of the EHR for Well-Child appointments of children ages 2-18 between March 1, 2017 and June 30, 2017 was performed. This search revealed 96 Well-Child appointments. Of these, a total of 30 charts met the criteria (BMI \geq 85th percentile) for inclusion and were further reviewed for all elements (BMI documentation, BMI percentile documentation, ICD-10 diagnosis, and documentation of weight-based counseling) using the aforementioned data collection tool. Data was collected directly from the electronic health record (EHR) by the project director.

Data Analysis

Descriptive data from the chart review was tallied and summarized with descriptive statistics. Data was interpreted as percentage rates of adherence. Rates were rounded to the

nearest whole percentage. This data was used to illustrate current practice trends during the guided discussion phase of this project. Data was presented in both table and graph format. As consistent with quality improvement, a summary of practice improvement planning generated in the guided discussion was disseminated back to the practice.

Guided Discussion

During phase 2 of the project, providers and other clinic staff were invited to participate in a guided discussion as later described. In total, 16 staff members participated, including 1 psychiatrist, 1 physician, 1 nurse practitioner, and 1 nurse practitioner student. The other participants included clinic nurses (who play a role in BMI calculation) social-workers, care-coordinators, and clinic administrators. As noted in the agenda, chart review results were disseminated to outline current provider practice. Additionally, current practice guidelines issued by the AAP (2007) were reviewed. The project leader then used reflective questions to guide participants in considering plans to improve and maintain practice so that it aligns with AAP recommendations (See Reflective Questions, Appendix B). A list of resources including examples of office based tool-kits and programs was also provided. A summary of ideas generated was disseminated back to the practice for reference and further use (Appendix F).

Results

Chart Review

As stated previously, a total of 96 Well-Child charts were identified for the specified time frame. Of these 96 charts, 63 were identified as healthy weight ($BMI < 85^{\text{th}}$ percentile), 30 charts met the criteria of overweight or obese ($BMI \geq 85^{\text{th}}$ percentile), and 3 charts lacked sufficient data to calculate BMI percentile. This translated to 66% of charts classified as healthy weight, 31% of charts classified as overweight or obese, and 3% of charts that lacked sufficient data to calculate

BMI or BMI percentile. Further breakdown differentiated between overweight (BMI 85th to 94th) and obese (BMI \geq 95th) charts. Of the children seen for Well-Child appointments during the specified time period, 10% (n=10) were overweight and 21% (n=20) were identified as obese. See Appendix D for table and graph format of these results.

BMI, BMI percentile, and ICD-10 documentation. As described previously, those charts identified as having BMI at the 85th percentile or greater were further reviewed for documentation of BMI, BMI percentile, ICD-10 diagnosis, and weight-based counseling. On review of these charts it was found that BMI was documented in 28 of the 30 charts reviewed, or 93% of charts meeting the inclusion criteria for review. BMI percentile documentation was completed in 25 of the 30 charts, or 83% of total charts meeting the inclusion criteria for review. None of the charts reviewed had documentation of the appropriate weight-based ICD-10 diagnosis.

Weight-based counseling documentation. Documentation of weight-based counseling was also reviewed for all charts meeting the criteria of BMI percentile of 85th percentile or greater. Upon review it was found that 22 of the 30 charts had some type of weight-based counseling provided. When broken down between nurse documentation of counseling and provider documentation of counseling it was found that nurses documented that weight-based counseling was given in 21 of the 30 charts, or 70%. However, provider documentation that weight-based counseling was performed was only done in 6 of the 30 charts, or 20%. See Appendix D for table and graph representation of these results.

Documentation of counseling was further broken down based on the 5210 message with charts reviewed for documentation of weight-based counseling for each category of the 5210 message: 5 servings of fruits or vegetables (or healthy eating patterns), limiting screen time to 2

hours, 1 hour of physical activity, and 0 sugary beverages. Nurse documentation rates for all categories was 70%. It was determined that nurses provide obese and overweight patients with a standardized, pre-printed handout regarding healthy living behaviors. The information in this handout covered all categories of the 5210 message.

Provider documentation rates broken down by 5210 category was as follows. Providers documented that the 5 servings of fruits and vegetables category was addressed in 5 of the 30 charts, or 17%. There were similar results for the physical activity category, with 17% of charts having documentation that this category was addressed. Limiting screen time was documented in 1 of the 30 charts or 3%. None of the charts reviewed contained documentation that the 0 sugary beverages message was addressed. See Appendix D for table and graph representation of these results.

Provider Discussion Session

Following the chart review a provider discussion session was held to discuss the chart review results and plan for improvement. As mentioned previously, 16 staff members participated, including 1 psychiatrist, 1 physician, 1 nurse practitioner and 1 nurse practitioner student. A list of 6 questions were used to guide discussion (Appendix C). Responses to these questions are outlined below. A summary of ideas generated during this discussion session was disseminated back to the clinic (Appendix F).

Question 1: What if anything surprises you about the chart review results?

Participants were surprised that the obesity rates for Missouri were actually slightly lower than national rates of obesity. Participants were also surprised that the rates of counseling were low. The providers in attendance felt that counseling was provided more than what was reflected by the chart review and that counseling was often provided but not documented. Participants also

mentioned that since their EMR had the ability to calculate BMI, it was surprising that rates of BMI documentation weren't 100%. Another point of interest was that since the EMR also had the capability to calculate and plot BMI percentile, it was surprising that the documentation rates of BMI percentile were less than that of BMI documentation.

Question 2: Do you feel that it is feasible to implement the AAP guidelines in your practice? The providers in attendance felt that implementation of the AAP (2007) guidelines would be feasible. They also mentioned that these guidelines would serve as an easy guide for prevention, management, and treatment in their patient population and would be a good way to facilitate and drive change in their practice.

Question 3: What do you foresee as the biggest barriers to change in practice? Participants identified multiple barriers to change in practice, including lack of time, sensitivity of to the topic, patient denial of need, patients' perspective of weight as being healthy, and lack of effectiveness of counseling. Providers felt that often times they find themselves repeating the same message over and over again with little impact on patient behaviors. They also mentioned that many of their patients were resistant to the idea that they or their children are overweight and need to change. The rural nature of their clinic also makes it difficult as many of their patients have limited financial resources and limited education. Finally, providers felt that a barrier to documentation was that they are often seeing multiple patients back to back and having to chart later. Their current EMR has checkboxes for different types of patient education that was provided. However, weight-based counseling is not currently an option. Therefore, by the time the providers finally get to chart they simply forget to document that this counseling was provided.

Question 4: How can these perceived barriers be overcome? What additional resources may be needed for successful implementation and adherence? Because lack of effectiveness and counseling and patients' perceptions that they are not overweight are two of the biggest barriers in this clinic, respondents felt that consistency would be the best way to overcome these barriers. This would include every healthcare provider delivering standardized weight based counseling to every patient at every well-child visit. Other suggestions for overcoming barriers to care were to consistently offer labs based on the AAP (2007) algorithm and use the data generated by these labs to show patients and their parents how their weight was affecting their health. To overcome barriers to documentation it was suggested that altering the EMR so that a check box for 5-2-1-0 or "weight-based counseling" would be added. This would have potential to increase documentation rather than relying on providers to free text the counseling interventions they provided. It would also serve as a reminder to document the counseling that was provided. Another suggestion was that best practice alerts be embedded into the EMR. These alerts would have the ability to suggest applicable orders based on AAP (2007) algorithm, diagnosis, and interventions such as counseling if patients met BMI percentile criteria.

Question 5: How do you propose to increase rates of recognition, diagnosis and weight-based counseling for child overweight/obesity in your practice? Participants had several suggestions on how to increase the rates of recognition, diagnosis and weight-based counseling. It was mentioned that the clinic is in the process of implementing a new EMR system so customization of the EMR to include best practice alerts and customized patient counseling points would be a plausible change to implement. Another suggestion was to develop BMI based care packets that would include weight-based counseling and community resources. Participants also discussed purchasing office material such as posters, handouts, and pamphlets

that displayed the 5-2-1-0 message. Finally, participants again mentioned that consistency in practice using the AAP (2007) algorithm would be key in increasing rates of recognition, diagnosis and counseling.

Question 6: What ideas do you have for maintaining long-term change? To maintain long-term change participants emphasized the need to stay aware of the issue. Quarterly chart review would also help track progress and determine what is working and what is not working to drive change. It was also mentioned that the use of office materials such as the posters and pamphlets mentioned earlier might serve as reminders to providers long-term. Finally, one of the physician providers mentioned the desire to investigate different teaching tools and ways to empower children and their families to change so that teaching would be more productive and providers didn't burn out from lack of effectiveness and patient resistance.

Discussion

This project consisted of two phases; chart review and provider discussion. The chart review phase served to determine provider documentation rates of BMI, BMI percentile, ICD-10 diagnosis, and weight-based counseling. The results of this phase were then utilized during the discussion session to illustrate strengths and weakness in care, therefore serving as a catalyst for improvement planning.

Overall, nearly one-third of charts reviewed were classified as either overweight or obese. This number is consistent with national childhood overweight and obesity rates (31%) and slightly above rates for the state of Missouri (28%) as described by 2011 data (Kaiser Family Foundation [KFF], 2017). Furthermore, the rate of obese children to overweight children in this clinic was roughly 2:1, thereby illustrating the extent to which children in this clinic were affected by weight issues.

Chart review revealed many insights into the care of the overweight or obese child in this clinic. Documentation rates for both BMI and BMI percentile were high, 93% and 83% respectively. This is higher than rates listed by previous studies reviewed, which revealed rates ranging from 0 to 79% (Chevlakumar et al., 2014). It was determined through discussion with providers that the EMR's capability to automatically calculate BMI and BMI percentile once height and weight were documented was a key factor in achieving these high rates of documentation. It was also established that clinic nurses were key in this process as they were often the ones documenting vital signs, including height and weight. Because of the ability of the EMR to automatically calculate BMI it was surprising to providers that BMI documentation rates were not 100%. Additionally, there was a 10% difference in rates of BMI documentation and BMI percentile documentation. It was determined that in order to calculate BMI percentile providers must click an additional button in the EMR. Awareness of this limitation of the EMR and how it impacted patient care was the first step to improving care processes through provider adaptation and/or EMR customization.

Additionally, chart review revealed that none of the charts reviewed contained documentation of the appropriate weigh-based ICD-10 diagnosis. Discussion with providers revealed barriers to documentation of the appropriate diagnosis. Barriers included fear of labeling the child and forgetting to document the diagnosis. However, use of the diagnosis would help to identify the child's healthcare needs between providers and would help direct their care. In fact, studies show that documentation of diagnosis is associated with higher rates of screening and management (Dilly, Martin, Sullivan, Seshadri, & Binns, 2007; Higgins, McCarville, Kurowski, McEwen, & Tanz, 2014; SanGiovanni, McElligott, Morella, & Basco, 2017). More specifically, Higgins et al. (2014) found that screening tests were ordered 42% of the time for

patients who were identified through documentation of weight-based diagnosis and just 6.5% of the time for those whose charts lacked documentation of diagnosis.

Provider documentation of weight-based counseling reflected what was found in the previously reviewed literature. Reyes (2015), showed that only 20% of patients received adequate weight-based counseling. Similarly, chart review results for this project revealed a provider documentation of counseling rate of just 20%. Furthermore, providers addressed only two of the 5-2-1-0 criteria; physical activity and healthy eating behaviors. Barriers to counseling included lack of effect, short appointment time, patient denial of need, and patient perception that weight impacts health.

Meanwhile, patients received nursing based counseling in the form of a standardized handout 70% of the time. This handout was inclusive for all four of the 5-2-1-0 criteria. However, nursing staff voiced that this handout was simply given to the patient and not reviewed with the patient by nursing staff. Therefore, it is undetermined whether the information in the handout was received and understood. While nursing education and counseling is an important adjunct to provider delivered weight-based counseling, it should not be a replacement for it. In fact, studies have found that the primary care provider is the most valued advisor on child weight (Hernandez et al., 2010), therefore emphasizing the importance of providers in the delivery of weight-based counseling.

The provider discussion session served as a way to discuss chart review results, recognize barriers to care, and develop a plan to improve care through the implementation of the AAP (2007) guidelines. It was originally planned to have only providers and the clinic manager participate in the improvement planning session. However, the clinic where this project took place is designated as a Medical Home which employs not only primary care providers but also

care coordinators, social workers, a psychiatrist and behavioral health specialists. Due to the all-encompassing effects of childhood overweight and obesity, the clinic manager felt it was important that all clinic staff be invited to participate as they all played an important role in the care of these children.

There was good overall attendance at the discussion session (N=16). However, of the 5 primary care providers (4 physicians, 1 NP) only two were present for the session. Timing of the meeting was most likely the reason for this, as two of the providers were on vacation and the third worked primarily at another clinic site, spending only one week a month at the clinic of interest. All participants were engaged in conversation and contributed to the planning discussion. The discussion session successfully served as a way to develop awareness of the issue, and generate ideas for improvement.

Many ideas were generated during the discussion session. These ideas were then summarized as an improvement plan and disseminated back to the clinic for their reference. A clear, concise message delivered consistently was the key theme for improving rates of weight-based counseling. It was agreed to adopt the 5-2-1-0 message, or something similar. Office aids such as posters, pamphlets, and handouts are planned to increase adherence and effect of the message. Customization of the EMR to include best practice alerts and reminders based on the AAP (2007) algorithm, was another central theme. Because the clinic is in the midst of implementing a new EMR system, customization to fit best practice is a possibility and it was decided that this would be discussed with those in charge of implementing this new system. Long-term change could be maintained through continued awareness of the issue, monthly chart reviews to determine what is working, and further research into methods is for empowering patients and their parents to change. In addition links for continuing education and virtual

simulation programs directed at obesity management were given to the providers during the discussion session.

Implications for Practice

As of 2014, obesity alone affected 12.7 million American children and adolescents (CDC, 2017). Additionally, research has determined that obesity in childhood leads to obesity in adulthood (CDC, 2014). Awareness of the issue is the first step in creating change. This project generated discussion about the topic and brainstormed ways to better care for this patient population. Provider discussion is a useful method for jumpstarting practice change because providers are able to provide input on how change is implemented, therefore improving provider buy-in. Moreover, this project aligns with the Healthy People 2020 goals to decrease the proportion of children and adolescents who are considered obese (U.S Department of Health and Human Services, 2017). Because the reach of childhood overweight and obesity is nationwide, many clinics could use this model to spark conversation and drive change to improve practice. This project set the stage for change to occur. Follow up projects would have potential to determine whether change occurred, as well what interventions were successful in creating change.

Limitations

It is important to discuss the limitations of this project. First off, one clinic is not representative of the entire healthcare field. Therefore, generalizability is limited. Second, while overall attendance at the discussion session was good, provider participation was only 40%. Providers not in attendance may have limited buy-in and may not be as aware of the problem and need for change in practice. Lastly, this project was only a starting point and additional projects are needed to track whether the intervention resulted in either short-term or long-term change.

Conclusion

Childhood overweight and obesity continues to be a nationwide crisis. Despite being respected advisors on child weight, few providers consistently follow the recommended guidelines for childhood overweight and obesity management published by the AAP (Barlow & Expert Committee, 2007). Increasing provider awareness of current practice trends through chart review has potential to excite discussion and change among clinic staff. While further studies are needed to determine the effectiveness of this project, improvement planning through provider discussion was able to set the stage for change in practice and improved patient care.

References

- American Academy of Family Physicians (2016). *Disease Management*. Retrieved from <http://www.aafp.org/about/policies/all/disease-management.html>
- American Academy of Pediatrics Institute for Healthy Childhood Weight. (2015). *Algorithm for the assessment and management of childhood obesity in patients 2 years and older*. Retrieved from https://ihcw.aap.org/Documents/Assessment%20%20and%20Management%20of%20Childhood%20Obesity%20Algorithm_FINAL.pdf#search=obesity
- American Heart Association (2014). *Overweight in children*. Retrieved from http://www.heart.org/HEARTORG/GettingHealthy/HealthierKids/ChildhoodObesity/Overweight-in-Children_UCM_304054_Article.jsp
- Ayash, C. R., Simon, S. R., Marshall, R., Kasper, J., Chomitz, V., Hacker, K., ... Taveras, E. M. (2013). Evaluating the impact of point-of-care decision support tools in improving diagnosis of obese children in primary care. *Obesity, 21*(3), 576-582.
- Barlow, S. E., & Expert Committee. (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. *Pediatrics, 120*(supplement 4), S164-S192.
- Centers for Disease Control and Prevention. (2014). *Childhood obesity facts*. Retrieved from <http://www.cdc.gov/healthyyouth/obesity/facts.htm>
- Centers for Disease Control and Prevention (2017). *Prevalence of childhood obesity in the United States, 2011-2014*. Retrieved from <https://www.cdc.gov/obesity/data/childhood.html>

- Chelvakumar, G., Levin, L., Polfuss, M., Hovis, S., Donohoue, P., Kotowski, A. (2014). Perception and documentation of weight management practices in pediatric primary care. *WMJ*, *13*(4), 149-153.
- Coleman, K. J., Hsii, A. C., Koebnick, C., Alpern, A. F., Bley, B., Yousef, M., ... Woods, S. D. (2012). Implementation of clinical practice guidelines for pediatric weight management. *The Journal of Pediatrics*, *160*(6), 918-922.
- Cygan, H. R., Baldwin, K., Chehab, L. A., Rodriguez, N. A., & Zenk, S. N. (2014). Six to success: Improving primary care management of pediatric overweight and obesity. *Journal of Pediatric Health Care*, *28*(5), 429-427.
- Daly, J., Chang, E., Hancock, K., & Crookes, P. (2004). Leading and managing change in nursing. In J. Daly, S. Speedy, & D. Jackson (Eds.), *Nursing leadership*. Australia: Elsevier Australia
- Diagnosis. (n.d.). Retrieved October 27, 2016, from <http://www.merriam-webster.com/dictionary/diagnosis>
- Dilley, K. J., Martin, L. A., Sullivan, C., Seshadri, R., & Binns, H. J. (2007). Identification of overweight status is associated with higher rates of screening for comorbidities of overweight in pediatric primary care practice. *Pediatrics*, *119*(1), e148-155.
- Dorsey, K. B., Mauldon, M., Magraw, R., Valka, J., Yu, S., Krumholz, H. M. (2010). Applying practice recommendations for the prevention and treatment of obesity in children and adolescents. *Clinical Pediatrics*, *49*(2), 137-145.
- Gance-Cleveland, B., Aldrich, H., Schmiede, S., & Tyler, K. (2016). Virtual obesity collaborative with and without decision-support technology. *International Journal for Quality in Healthcare*, *28*(3), 316-323.

- Gibson, S.J. (2016). Translation of clinical practice guidelines for childhood obesity prevention in primary care mobilizes a rural Midwest community. *Journal of the American Association of Nurse Practitioners*, 28(3), 130-137.
- Grossman, S. C., & Valiga, T. M. (2016). *The new leadership challenge*. Philadelphia, PA: F. A. Davis Company.
- Harvard (2015). Economic costs. In *Obesity prevention source*. Retrieved from <http://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/economic/>
- Hernandez, R. G., Cheng, T. L., & Serwint, J. R. (2010). Parents' health weight perceptions and preferences regarding obesity counseling in preschoolers: Pediatricians matter. *Clinical Pediatrics*, 49(8), 790-798. doi: 10.1177/0009922810368288
- Higgins, A., McCarville, M., Kurowski, J., McEwen, S., & Tanz, R. R. (2014). Diagnosis and screening of overweight and obese children in a resident community clinic. *Global Pediatric Health*, e1-6. doi: 10.1177/2333794X14559396.
- John, T., Morton, M., Weissman, M., O'Brien, E., Hamburger, E., Hancock, Y., & Moon, R. Y. (2014). Feasibility of a virtual learning collaborative to implement an obesity QI project in 29 pediatric practices. *International Journal for Quality in Health Care*, 26(2), 205-213.
- Johnson, R. B., Christensen, L. (2014). *Educational research: Qualitative, quantitative, and mixed approaches*. Thousand Oaks, CA: Sage Publications
- Kaiser Family Foundation (2017). *Percent of Children (ages 10-17) who are overweight or obese*. Retrieved from <http://www.kff.org/other/state-indicator/overweightobese-children/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

- Klein, J. D., Sesselberg, T. S., Johnson, M. S., O'Connor, K. G., Cook, S., Coon, M., ... Washington, R. (2010). Adoption of body mass index guidelines for screening and counseling in pediatric practice. *Pediatrics, 125*(2), 265-272.
- Looney, S. M., Spence, M. L., & Raynor, H. A. (2011). Use of body mass index and body mass index growth charts for the assessment of childhood weight status in the United States: A systematic review. *Clinical Pediatrics, 50*(2), 91-99. doi 10.1177/0009922810379911.
- Reyes, I. (2015). An evaluation of the identification and management of overweight and obesity in a pediatric clinic. *Journal of Pediatric Health Care, 29*(5), e9-14. doi: 10.1016/j.pedhc.2015.05.002.
- Sangiovanni, E., McElligot, J., Morella, K., & Basco, W. (2017). Underdiagnosis and lower rates of office visits for overweight/obese pediatric patients in rural compared with urban areas. *The Southern Medical Association, 110*(7), 480-485. doi: 10.14423/SMJ.0000000000000672.
- Savinon, C., Smith-Taylor, J., Canty-Mitchell, J., & Blood-Siegfried, J. (2012). Childhood obesity: Can electronic medical records customized with clinical practice guidelines improve screening and diagnosis? *Journal of the American Academy of Nurse Practitioners, 24*, 463-471.
- Shaikh, U., Nettiksimmons, J., Joseph, J., Tancredi, D., Romano, P. S. (2014). Healthy eating active living telehealth community of practice (HEALTH COP). *American Journal of Medical Quality, 29*(6), 467-475.
- Shirey, M. (2013). Lewin's theory of planned change as a strategic resource. *Journal of Nursing Administration, 43*(2), 69-72.

- U.S. Department of Health and Human Services. (2017). Nutrition and weight status. In *2020 topics and objectives*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/nutrition-and-weight-status/objectives>
- Young, E. L. (2015). Increasing diagnosis and treatment of overweight and obese pediatric patients. *Clinical Pediatrics*, *54*(14), 1359-1365.
- Young, P. C., DeBry, S., Jackson, W. D., Metos, J., Joy, E., Templeman, M., & Norman, C. (2010). Improving the prevention, early recognition, and treatment of pediatric obesity by primary care physicians. *Clinical Pediatrics*, *49*(10), 964-969
- World Health Organization (2015). *Childhood overweight and obesity*. Retrieved from <http://www.who.int/dietphysicalactivity/childhood/en/>

Appendix A

Chart # _____

Demographics:

Age: _____ Gender: _____ Weight: _____ Height: _____

BMI:

Documented: _____ (y/n) Value: _____ Correct Value: _____ (y/n)

BMI Percentile:

Documented: _____ (y/n) Value: _____ Correct Value: _____ (y/n)

ICD 10 Code

Documented: _____ (y/n) Value: _____ Correct Value: _____ (y/n)

Counseling

5 vegetables/fruits: _____ (y/n) 2hr screen time or less: _____ (y/n)

1hr physical activity: _____ (y/n) 0 sugary beverages: _____ (y/n)

Other education: _____

Appendix B

Guided Discussion Questions:

1. What if anything surprises you about the chart review results?
2. Do you feel that it is feasible to implement the AAP guidelines in your practice?
3. What do you foresee as the biggest barriers to change in practice?
4. How can these perceived barriers be overcome? What additional resources may be needed for successful implementation and adherence?
5. How do you propose to increase rates of recognition, diagnosis and education for child overweight/obesity in your practice?
6. What ideas do you have for maintaining long-term change?

Appendix C

	FITZGIBBON HOSPITAL	2305 S. HIGHWAY 65 RD. BOX 250 MARSHALL, MO 65340 PHONE: 660-7432 FAX: 660-616-9001 www.fitzgibbon.org
<i>Improving the health of our community</i>		

May 17, 2017

Amy Herman is a doctoral student from the University of Kansas School of Nursing who has expressed a desire to complete a DNP project at our Marshall Family Practice Clinic in Marshall, MO.

Amy has provided us with a copy of her proposal and discussed her role in obtaining and analyzing data and sharing this with the practice group for this quality improvement project.

We are in agreement with the proposal and agree to allow Amy to complete her data collection via retrospective chart review at the clinic.

Sincerely,

Andrew Snyder M.B.A.
Director of Rural Health Clinics
Marshall Family Practice/John Fitzgibbon Memorial Hospital
2305 S. Highway 65, Building A, Marshall, MO 65340

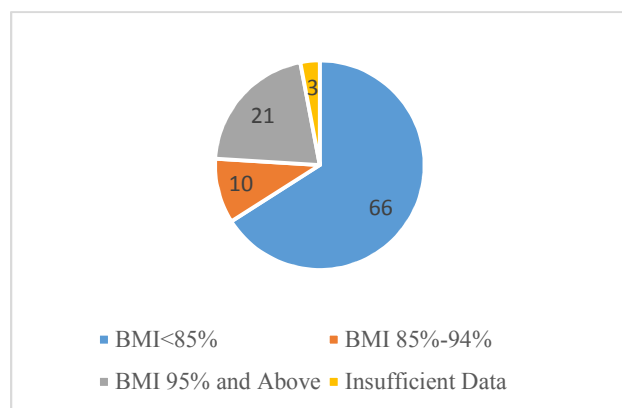
Fitzgibbon Hospital is a 501(c)(3) not-for-profit organization

Appendix D

By the Numbers: Overweight and Obesity Rates based on Chart Review Data

Breakdown of Well-Child Appointments March 1, 2017-June 30, 2017				
	BMI<85%	BMI≥85%	Insufficient Data	Total
# of Charts	63	30	3	96
% of Total	66%	31%	3%	100%

Further Breakdown of Overweight and Obese Children Seen for Well-Child Appointments March 1, 2017-June 30, 2017	
Overweight (BMI 85%-94%)	Obese (BMI≥95%)
10%	21%



Comparison to National and State Rates		
Nationwide children with BMI≥85%	Missouri Children with BMI≥85%	Children in this Clinic with BMI≥85%
31% (Kaiser Family Foundation [KFF], 2017) *value as of 2011	28% (KFF, 2017) *Value as of 2011	31%

Kaiser Family Foundation (2017). Percent of Children (ages 10-17) who are overweight or obese. Retrieved from <http://www.kff.org/other/state-indicator/overweightobese-children/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

Chart Review Results: BMI, BMI Percentile, and ICD-10 Documentation for Charts of Overweight and Obese Children

Rates of BMI, BMI % and ICD-10 Documentation for Charts of Overweight and Obese Children						
	BMI Documentation		BMI % Documentation		ICD-10 Diagnosis Documentation	
	Yes	No	Yes	No	Yes	No
# of Charts	28	2	25	5	0	30
% of Total Charts Reviewed (n=30)	93%	7%	83%	17%	0%	100%

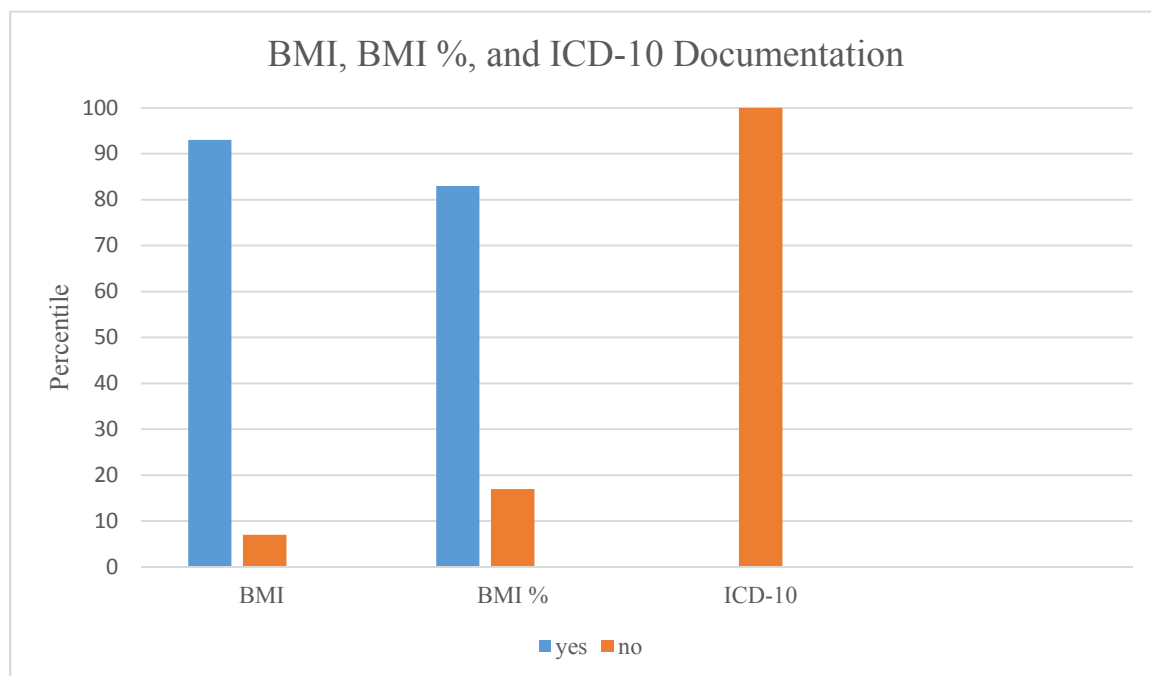
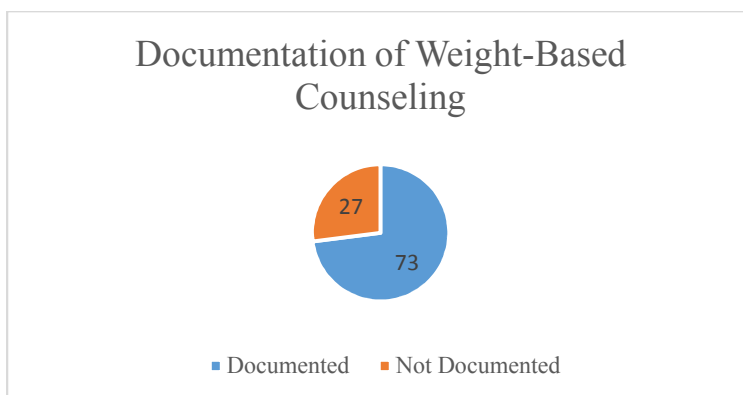


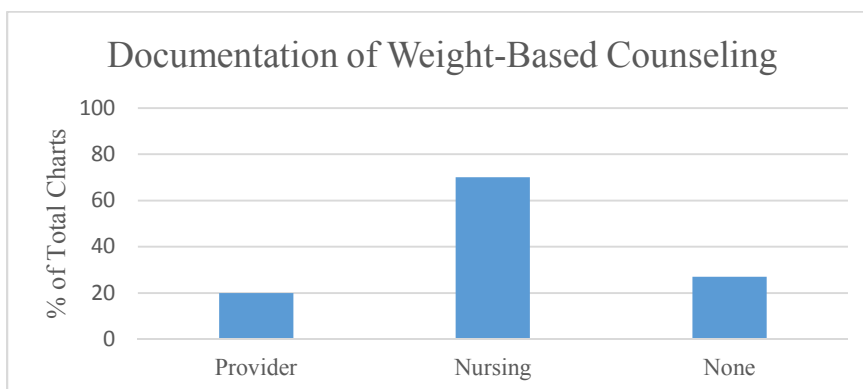
Chart Review Results: Weight-Based Counseling for Charts of Overweight and Obese Children

Documentation of Weight-Based Counseling		
	Documented	Not Documented
# of Charts	22	8
% of Total Charts Reviewed (n=30)	73%	27%



Documentation of Weight-Based Counseling			
	By Provider	By Nursing (Printed Handout)	None Documented
# of Charts	6	21	8
% of Total Charts Reviewed (n=30)	20%	70%	27%

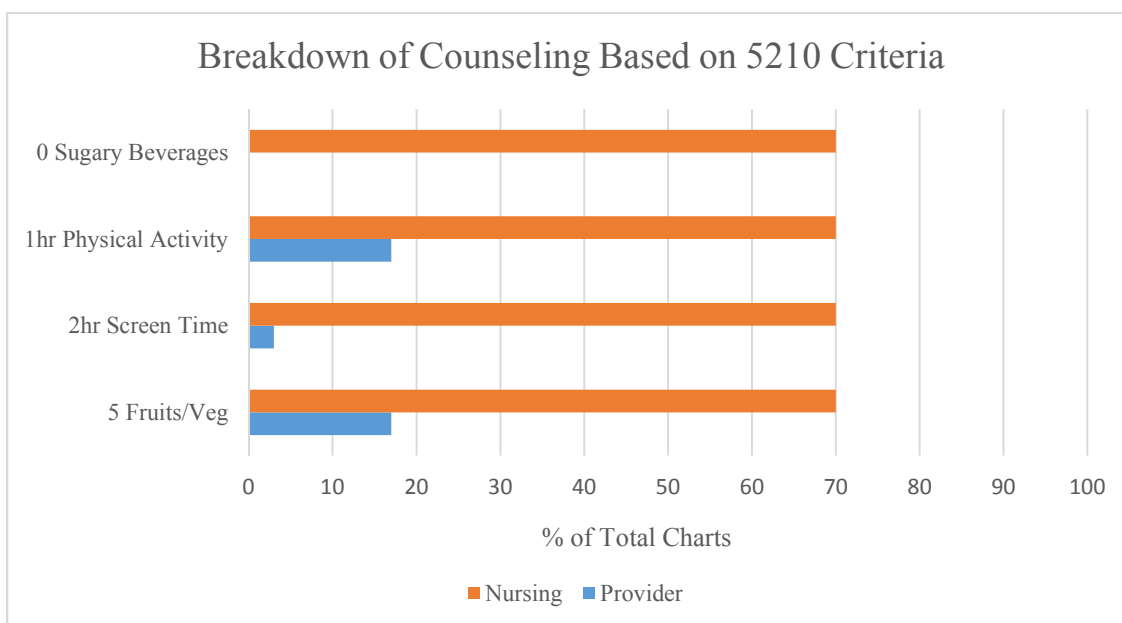
*some charts had counseling documented by both nursing and provider



Breakdown of Weight-Based Counseling Based on 5210 Criteria

Breakdown of Counseling Based on 5210 Criteria: PROVIDER				
	5 Servings of Fruits/Vegetables	Limit to 2 hours of Screen Time	1 Hour of Physical Activity	0 Sugary Beverages
# of Charts	5	1	5	0
% of Total Charts Reviewed (n=30)	17%	3%	17%	0%

Breakdown of Counseling Based on 5210 Criteria: NURSING (Standardized Printed Handout)				
	5 Servings of Fruits/Vegetables	Limit to 2 hours of Screen Time	1 Hour of Physical Activity	0 Sugary Beverages
# of Charts	21	21	21	21
% of Total Charts Reviewed (n=30)	70%	70%	70%	70%



Appendix E

1200-1201 (1 minute)	Introduction of project
1201-1211 (10 minutes)	<p>Review of AAP (2007) Guidelines. The following documents will be provided and discussed.</p> <ul style="list-style-type: none"> • Summarized list of AAP recommendations from: Barlow, S. E., & Expert Committee. (2007). Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. <i>Pediatrics</i>, 120(supplement 4), S164-S192. • Algorithm for Assessment and Management of Childhood Obesity: American Academy of Pediatrics Institute for Healthy Childhood Weight. (2015). <i>Algorithm for the assessment and management of childhood obesity in patients 2 years and older</i>. Retrieved from https://ihcw.aap.org/Documents/Assessment%20%20and%20Management%20of%20Childhood%20Obesity%20Algorithm_FINAL.pdf#search=obesity • 5210 Handout: American Academy of Pediatrics (2015). <i>Pediatric obesity clinical decision support</i>. Retrieved from http://reader.aappublications.org/5210-pediatric-obesity-clinical-decision-support-chart-2nd-ed/1?printMode=true • Additional Resources List including the above references as well as <ul style="list-style-type: none"> ○ https://ihcw.aap.org/Pages/default.aspx ○ https://www.aap.org/en-us/about-the-aap/Committees-Councils-Sections/provisional-section-on-obesity/Pages/default.aspx ○ http://www.letsgo.org/programs/healthcare/ ○ https://brightfutures.aap.org/Bright%20Futures%20Documents/5-Promoting_Healthy_Weight.pdf ○ Pediatric ePractice at: http://pep.aap.org/ ○ Change Talk: Childhood Obesity at: https://simulations.kognito.com/changetalk/?dly=20 ○ AAP Patient Education: Healthy Growth APP <ul style="list-style-type: none"> ▪ Download from: https://itunes.apple.com/us/app/aap-patient-education-healthygrowth/id648888362?mt=8 ○ Child Obesity in Primary Care: A Series of Educational Modules <ul style="list-style-type: none"> ▪ Free access at: https://ihcw.aap.org/Pages/ChildhoodObesityPC.aspx
1211-1215 (4 minutes)	Discussion of chart review results. This will be provided in handout format. Rates will be depicted in table and graph format
1215-1255 (40 minutes)	<p>Guided discussion for practice improvement (40 minutes)</p> <ul style="list-style-type: none"> • See Appendix B for guided discussion questions
1255-1300 (5 minutes)	Recap and summarization of plan for improvement

Appendix F

Summary of Discussion and Plan for Improvement

Reaction to Chart Review Results

- Participants were surprised by the low documentation rate for weight-based counseling. Many felt like counseling was provided more than what was reflected by the documentation and that the problem was related more to documentation rather than not providing the weight-based counseling.
- Because the EMR has the ability to calculate BMI, participants were surprised that there were charts missing this documentation even though height and weight were documented.
- Since EMR also has the ability to plot BMI percentile, participants were also confused as to why rates of this documentation were lower than that of BMI.
 - One provider voiced that this requires clicking an additional button and perhaps this is incidentally getting missed.

Feasibility of Implementing AAP (2007) Recommendations

- Those in attendance felt that implementation of the AAP (2007) recommendations would be feasible and that using the AAP (2007) step-wise algorithm would be an effective way to manage this patient population.

Barriers to Change

- Lack of perceived effectiveness
- Limited appointment time
- Sensitivity of the topic
- Patient denial of need
- Patients perceived weight as healthy
- Limitations of the current EMR

Methods of Overcoming Barriers to Facilitate Change

- Being consistent with the message: every patient, every time.
- Offering labs recommended by the AAP (2007) algorithm then using the data generated to illustrate the effects the excess weight has taken on the body.
- Adding a selection box for 5-2-1-0 criteria in the patient education section of the EMR.
 - Providers would be able to click this box and a summarized narrative of 5-2-1-0 criteria would automatically be translated into the SOAP note.
 - Will also serve as a reminder to providers.

- Customization of the EMR to include best practice alerts. For example, if certain BMI percentile criteria were met then a drop down box of associated orders, interventions, and diagnosis reminders would appear. This would serve to embed the AAP (2007) algorithm directly into the EMR.

Plan for Improvement

- Discuss with those involved in the new EMR implementation to determine ability to customize the new EMR with embedded AAP algorithm, best practice alerts, and ease of documentation.
- Adoption a 5-2-1-0 (or similar) message for weight-based counseling.
- Investigate feasibility of obtaining 5-2-1-0 posters and handouts for clinic rooms and waiting room.
- Develop a BMI based care packet that would provide more education on obesity as well as community resources available.
- Be consistent in care. Follow the algorithm with every patient so it becomes habit. Every patient, every visit.
- Investigate teaching tools and methods for delivering weight-based counseling in a way that empowers the patient and family to take charge of their health so that interventions are more productive.
- Utilize quarterly chart review to track progress and determine what interventions are working and what adaptations may need to be made. This would assist in creating long-term change.
- Continue to be aware of the issue. Could possibly use staff meetings as a quick check in to review quarterly chart review results and ask providers for input. This would also assist in creating long-term change.