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Combating Childhood Obesity with Provider Education: A Quantitative Study

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COMBATING CHILDHOOD OBESITY WITH PROVIDER EDUCATION: A QUANTITATIVE STUDY

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A QUANTITATIVE STUDY

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COMBATING CHILDHOOD OBESITY WITH PROVIDER EDUCATION: A QUANTITATIVE STUDY

An Abstract of the Project by
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The study included an educational program to providers and nurse practitioner students in order to evaluate whether an increase in knowledge and accuracy occurred based on knowledge of evidenced-based responses to specific indicators of childhood overweight and obesity. It assessed the providers' knowledge and sought to evaluate if increased knowledge occurred after an educational program presentation. Following the educational program, a follow-up survey was distributed via email to assess the providers self-reported perceived practice change six weeks after the education.

Part one measured if an increase in knowledge of the 5210 components, correct laboratory testing, and assessment of comorbidities occurred. The 5210 components include recommendations on activity, screen time, sugary drinks, and diet from the American Academy of Pediatrics (AAP) and the Institute for Clinical Systems Improvement (ICSI). Improved accuracy in applying diagnostic criteria based on current evidenced-based practice guidelines in childhood obesity after the educational session was also evaluated. The second part of the study evaluated if a self-reported perceived practice change occurred six weeks post education.

The target population was recruited from the 4-State APN (advanced practice nurse) conference in March 2016. A pretest was given to participants followed by a power point presentation and concluded with a posttest. Once the surveys were complete, a question and answer period followed. A *t*-test was conducted on the pretest and posttest

results. A six week follow-up study was performed utilizing comparative analysis following the education. The follow-up surveys were distributed via email. The study concluded with statistical significance ($p < 0.05$) that the education provided increased providers' knowledge of current evidenced-based practice guidelines in childhood obesity. All participants (n=41) had an increase in posttest scores after the education was provided. Results from part two of the study indicated an increase in usage of the 5210 guideline components with patient education and an increase in comorbidity assessment.

Current practice revealed low use and documentation of BMI, even though studies have established that the use of an accurate diagnosis of obesity is one of the highest indicators of treatment. Providers that participate in obesity related continuing education (CE) were found to be more familiar with the recommendations and have better adherence to current evidence-based practice guidelines. The findings of the study indicate that many providers are not aware of the current clinical practice guidelines in childhood obesity. Although information is readily available, providers must continuously update their knowledge to improve care for overweight and obese children. This study validates the need for continued educational programs for providers in childhood obesity.

TABLE OF CONTENTS

CHAPTER……..……PAGE

I. INTRODUCTION…….....1

Statement of Problem…….……3
Significance to Nursing……...…...……5
Purpose/Objectives…….……...6
Conceptual Framework…….……...….8
Research Questions……...…….……...……11
Definition of Key Terms/Variables……...……11
Logic Model…….…….……13
Summary……16

II. LITERATURE REVIEW…..…….……17

Practice Change Guidelines……...……...…….18
Selection of Best Practice Guidelines……18
Practice Change Recommendations for Implementation…...……19
Assessment Algorithm.....22
Medical Risk.....24
Screening and Diagnosis.....24
Assessment for Comorbidities.....27
Behavior Risk.....30
Prevention.....30
5210 Guidelines.....31
Attitudes.....32
Readiness to Change/Motivational Interviewing.....32
Provider Diagnosis.....33
Provider Barriers.....35
Provider Practice.....36
Summary……...……...…….37

III. METHODOLOGY…….……38

Project Design……38
Settings and Participants……41
Recruitment……...….42
Inclusion/Exclusion Criteria..……...……42
Protection of Human Subjects……...……43
Ethical Considerations……...…44
Instrument…….……44
Content Validity…….……46
Operational Definitions…….……47
Procedure…….……..…….…….48
Data Collection……....…….……49

CHAPTER……..….PAGE

Outcome Data……50
Outcomes……..……51
Evaluation Measures Linked to Objectives……...……51
Instrument Linked to Measures and Objectives…….……..…….……52
Methods of Analysis…….……55
Sustainability……..……..55
Summary…….…….…….……56

IV. FINDINGS…….…….…….58

Introduction…….…….…….……58
Demographic Data…….……59
Pretest, Posttest and Follow-Up…….……60
Results of the Study…….…….59
Quantitative Results-Part 1……...……..…61
Quantitative Results-Part 2……...…….……61
Summary……66

V. SUMMARY, CONCLUSIONS, RECOMMENDATIONS…….……69

Introduction…….…….…….……69
Relationships of Outcomes to Research……69
Increased Accuracy Identifying Diagnostic Criteria…….……69
Self-Reported Increase in Diagnosis of Overweight/Obesity…....70
Increased Accuracy in Selecting Appropriate Lab Testing……...71
Self-Reported Increase in Ordering Recommended Lab Testing..72
Increased Knowledge of the 5210 Program……...……72
Increased Accuracy Identifying Comorbidities……...…….……73
Observations…….……74
Evaluation of Conceptual Framework…….……..…75
Evaluation of Logic Model……76
Study Limitations…….…….……77
Implications for Future Research…...……....…….…...……77
Implications for Practice, Policy and Education……78
Conclusion…….80

REFERENCES……...……...……81

APPENDICES…….…….……89

LIST OF TABLES

TABLE……PAGE

1. Summary of Prevention and Management of Obesity……20

2. Objectives, Measurements and Outcomes…….53

3. Demographic Information……60

4. Comparison of Scores……62

5. *t*-test Results……63

6. Comparison of Incorrect Answers……64

7. Six Week Follow-Up……67

LIST OF FIGURES

FIGURE……...……PAGE

1. Chronic Care Model……...……10

2. Logic Model…….....15

3. Universal Assessment of Obesity Risk and Steps to Prevention……...……24

4. Algorithm for Screening and Diagnosis…….…….....……27

5. Study Design…….…….....40

Chapter I

"I am a fat kid
I have a fat mom and dad
But I will die first."
(Hopkins, DeCristofaro, & Elliott, 2011)

Introduction

Childhood obesity is considered a major health threat. The World Health Organization (WHO) has labeled the epidemic of childhood obesity as "globesity" (Hopkins et al., 2011). Obesity is a chronic disease that is not fully understood but is believed to be multifactorial (Akhtar-Danesh, Dehghan, & Merchant, 2012). The number of obese children in the United States tripled from 1970-2000 (Gee, Chin, Ackerson, Woo, & Howell, 2013). Since 2005, the prevalence of obesity among children and adolescents, ages two through nineteen, has remained fairly stable at about 17% and now affects 12.7 million children and adolescents (Centers for Disease Control, 2014). Other studies document that 32% of children are considered overweight and 18% considered obese (Savinon, Taylor, Canty-Mitchell, & Blood-Siegfried, 2012; Armstrong, Wacker, Best, & McPherson, 2011). Children who were overweight at the age of five were four times more likely to be obese between the ages of five and fourteen than children that were a normal weight at that age (Cunningham, Kramer, & Narayan, 2014). One study found that approximately 70% of obese adolescents will become obese adults (Akhtar-

Danesh et al., 2012). The Bogalusa Heart Study was even more impressive and found that 84% of children with a BMI between the 95th and 98th percentile became obese adults, while those with a BMI over the 98th percentile became obese 100% of the time (Savinon et al., 2012). According to recent studies it is possible that this generation of children will be the first in history to have a shorter lifespan than previous generations (Cygan, Baldwin, Chehab, Rodriquez, & Zenk, 2014; Hopkins et al., 2011).

Multiple comorbidities are associated with childhood obesity. A fasting lipid profile, fasting glucose, and aminotransferase are suggested for children and adolescents who are above the 95th percentile for weight (Kar, Dube, & Kar, 2014). Obesity is associated with type II diabetes, cardiovascular disease, metabolic syndrome, fatty liver disease, orthopedic problems and sleep apnea (Shreve, 2015). Among adolescents with a body mass index (BMI) over the 95th percentile, almost 40% have at least two risk factors for cardiovascular disease and almost 20% have three or more (Shreve, 2015). Strong associations exist between childhood obesity and early onset dyslipidemia, hypertension, and insulin resistance (Raghuveer, 2010). A study by Franks et al. (2010) addressed the extent in which obesity, glucose intolerance, hypertension, and hypercholesterolemia without diabetes predicted premature death in children. Premature death was defined by the study as death before 55 years of age. This is significant to providers since an increase in chronic health problems will be seen at a younger age and require increased acuity of care.

The fight against obesity and for lifelong health and wellness begins in childhood. As noted in a study by Cunningham et al. (2014) the course for childhood obesity leading into adult obesity may already be established by age five. Children that are overweight in

kindergarten are responsible for over half of children that are overweight/obese between the ages of five and fourteen (Cunningham et al., 2014). Multiple interventions will be needed to resolve this complex and ever-evolving disease. The primary care setting is often the only place young children are seen for care. Visits are frequently for acute problems and not well-child visits or physicals. Primary care providers need to be more comfortable in discussing, diagnosing, managing, and educating both children and parents on current childhood obesity recommendations. A collaborative approach with other health providers, use of current guidelines, parental support, and education will be required. Provider education utilizing the International Clinical Systems Improvement (ICSI) health care guidelines is the foundation for this project.

Statement of the Problem

Experts agree that pediatric obesity needs to be addressed in the primary care setting. However, studies continue to show a lack of knowledge and accuracy by providers with the current evidenced-based practice guidelines. Research indicates that providers fail to document a diagnosis of obesity in children and to discuss the topic of obesity with them. Current recommendations suggest that providers calculate, track, and document the patients BMI at every office visit (Jacobson & Gance-Cleveland, 2010). Chart audits of pediatric visits in several studies show a lack of adherence to the recommendations with one study having only a 20% documentation of BMI and another with 28% of obese children being identified on their medical charts (Jacobson & Gance-Cleveland, 2010). According to Shreve (2015) only 15% have documented sedentary behaviors and physical activity. One study found that although 19.5% of children have a BMI indicative of an overweight or obese diagnosis, only 7% had a documented ICD-9

code of overweight or obesity (Walsh, Milliren, Feldman, & Taveras, 2013). Only 15.2% had a positive response documented to provider questions such as "Does the patient now have obesity?" (Walsh et al., 2013).

Research has shown that providers are not aware of the current guidelines, and if they are aware of the guidelines, they are not following them as recommended (Harkins, Lundgren, Spresser, & Hampi, 2012). As studies suggest, if a provider is aware of the guidelines, the more likely they are to use them (Harkins et al., 2012). Use of the evidenced-based guidelines has been proven to decrease childhood obesity (Rausch, Perito, & Hametz, 2011). Studies of current practices revealed low use and documentation of BMI, even though it has been proven that the use of an accurate diagnosis of obesity is one of the highest indicators of treatment (Harkins et al., 2012). Children with a diagnosis of obesity were 8.8% more likely to receive weight-related counseling than those without a diagnosis (Nader et al., 2014). Awareness but not knowledge of the current guidelines were reported by 70% of physicians in one study (Harkins et al., 2012). Once obesity and overweight is accurately diagnosed treatment can begin.

Many barriers exist with implementation of current recommendations (Sample, Carroll, Barksdale, & Jessup, 2013). A study that evaluated 96 articles revealed that familiarizing providers with weight assessment tools, guidelines, and educational material is most important to removing barriers to care (Vine, Hargreaves, Briefel, & Orfield, 2013). Barriers include lack of motivation by children and parents, lack of support within the facility, providers lack of current knowledge, and not feeling like they are making a difference in care (Jacobson & Gance-Cleveland, 2010). When discussing

barriers, it is important to be aware of realistic areas of change with the provider. The provider does not have the ability to change most of the barriers related to childhood obesity. However, learning the guidelines and implementing them is within the provider's ability. A study by Savinon et al. (2012) found a significant improvement in documenting BMI at 3 and 6 months' after the providers received education. A provider's practices in assessment and management of childhood overweight and obesity were improved after education was provided (Savinon et al., 2012). Continuing education (CE) on obesity has been associated with better adherence to guidelines (Sesselberg, Klein, O'Connor, & Johnson, 2010; Savinon et al., 2012). Recommendations suggest that providers must be adequately trained in standardized, evidence-based assessment in order to effectively prevent, diagnose, and treat childhood overweight and obesity (Vine et al., 2013). Clinical practice guidelines provide evidence-based interventions to assure improved patient outcomes. One study found that providers that had any obesity training had increased levels of self-efficacy and increased counseling to patients and family (Lowenstein et al., 2013, Savinon et al., 2012). This scholarly project intends to remove one of these barriers by increasing providers' knowledge and subsequently increasing accuracy with current evidenced-based practice guidelines in childhood obesity.

Significance to Nursing

The rise in childhood obesity has become a disturbing trend. Providers have the unique opportunity to not only treat, but prevent childhood obesity. Primary care providers are capable of providing care to these children; so why aren't they? Providers should evaluate for this disease and educate the patients and their families to help decrease the incidence. Primary care providers must take action to become more

informed about obesity and to position themselves as role models and educators for their families, communities, and patients. One study indicated 69% of physicians preferred to use guidelines to treat childhood obesity, followed by BMI growth charts (57%) and continuing medical education courses (55%) (Nicholas, Dennison, De Long, Prokorym, & Brissette, 2009). That same study found that after a toolkit was provided, the intervention group increased the use of BMI percentiles significantly in the two- through five-year-old age group and approached significance in the six- through twenty-year-old age group (Nicholas et al., 2009).

Providers that participate in obesity related continuing education were found to be more familiar with the recommendations (Sesselberg et al., 2010). Sesselberg et al. (2010) performed a study that concluded that participation in CE has been associated with better adherence to current evidenced-based guidelines. Education of primary care providers is extremely important in order to deliver the most up-to-date care for patients. Providing education can offer a simpler approach to the guidelines and therefore increase the usage of the guidelines. With proper education providers have the unique opportunity to play a critical role in replacing the obesity epidemic with a trend toward wellness.

Purpose and Objectives

The aim of this scholarly project was to evaluate if educating primary care providers in childhood obesity guidelines increased knowledge of 5210 components, accurate laboratory testing, and comorbidity assessment, along with improving accuracy in applying diagnostic criteria related to current evidenced-based practice guidelines in childhood obesity. This project also assessed whether the education changed providers

self-reported practices at a six weeks following the education. Specific research questions include:

1. Will education increase the accuracy of providers when identifying diagnostic criteria based on current practice guidelines for childhood obesity/overweight?

2. Will education increase the accuracy of providers when selecting appropriate lab testing for children based on current practice guidelines for childhood obesity/overweight?

3. Will education increase the providers' knowledge of the 5210 program components?

4. Will education increase the accuracy of providers when identifying comorbidities associated with obesity/overweight?

5. Will providers have a self-reported increase in diagnosis of overweight and obesity six weeks post education?

6. Will providers have a self-reported increase in ordering recommended laboratory testing for children that are overweight/obese six weeks post education?

7. Will providers have a self-reported increase in assessment of comorbidities for overweight/obese children six weeks post education?

The increased incidence and prevalence of childhood obesity coupled with significant morbidity and financial burden suggest the need for educating primary care providers with the current evidenced-based clinical practice guidelines. Provider education and evaluation that focuses on increasing accuracy with diagnosis and

laboratory testing, along with increasing knowledge of the 5210 components and comorbidity assessment, are needed to address this chronic health problem.

Conceptual Framework

The conceptual framework that was used for this project is the chronic care model (CCM). It is a framework for disease management and quality improvement based on evidenced-based practice (EBP) (Cygan et al., 2014). It involves community resources and policies, health system organization, self-management support, decision support, computer support, and delivery system change (Cygan et al., 2014). It offers a comprehensive approach for communities and providers to manage obesity (Cygan et al., 2014). Obesity is a chronic condition and may benefit from using the chronic care model that integrates community resources, health care, and patient self-management (Barlow, 2007).

Education utilizing the current recommendations and the CCM will have positive influences on both patient and provider outcomes. The primary care clinic functions within the environment of the community's resources and health policies. The model (Figure 1) depicts the provider’s practice as an interlacing entity within the project. Within that realm of organization, the clinic must provide self-management support, delivery system redesign, decision support and computer information systems (CIS) in order to follow the CCM. Improved accuracy with guidelines will take place within this circle. Self-management support for patients include motivational interviewing (MI), family education utilizing the 5210 components, and a pediatric weight management plan. Jacobson et al. (2010) relate that patient self-management is the core determinant in the obesity CCM. Decision support includes utilization of evidenced-based guidelines.

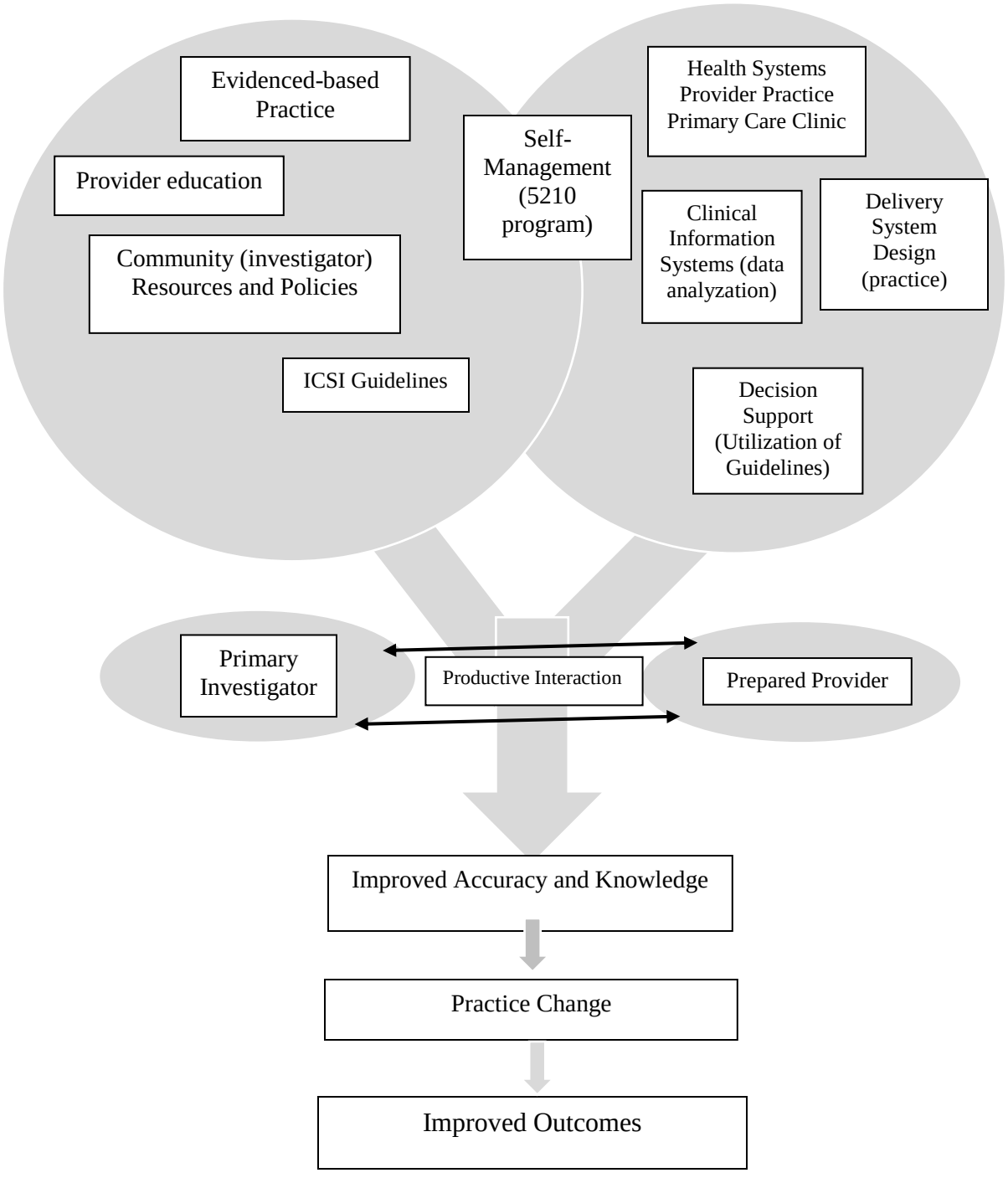
This project focuses on current evidenced-based clinical practice guidelines from the International Clinical Systems Improvement (ICSI) for the basis of the education. Delivery-system redesign includes education to providers with time management suggestions to promote better care, accuracy, and follow-up of identified patients. Clinical information systems provided data to evaluate if the provider has increased adherence to the guidelines.

Results suggest that intervention programs that include more components of the Chronic Care Model are more effective with management and prevention of childhood obesity (Jacobson & Gance-Cleveland, 2010; Haemer et al., 2011). Therefore, it was recommended that any future overweight and obesity study for children and adolescents begin with a systematic training program based upon the Chronic Care Model for Childhood Obesity (Jacobson & Gance-Cleveland, 2010).

Figure 1:

Chronic Care Model

(Adaptation)



Research Questions

1. Will education increase the accuracy of providers when identifying diagnostic criteria based on current practice guidelines for childhood obesity/overweight?
2. Will education increase the accuracy of providers when selecting appropriate lab testing for children based on current practice guidelines for childhood obesity/overweight?
3. Will education increase the providers' knowledge of the 5210 program components?
4. Will education increase the accuracy of providers when identifying comorbidities associated with obesity/overweight?
5. Will providers have a self-reported increase in diagnosis of overweight and obesity six weeks post education?
6. Will providers have a self-reported increase in ordering recommended laboratory testing for children that are overweight/obese six weeks post education?
7. Will providers have a self-reported increase in assessment of comorbidities for overweight/obese children six weeks post education?

Definition of Key Terms/Variables

Definitions of important terms include: body mass index (BMI), clinical practice guidelines, 5210 program, laboratory, education, CE, nurse practitioner, and self-report. The following definitions are provided for the purpose of this project.

1. Body Mass Index (BMI)- a useful tool to assess body fat. It is defined as weight (in kilograms) divided by the square of height (in meters) (Institute for Clinical

Systems Improvement, 2013). BMI levels correlate with body fat and with coexisting health risks (ICSI, 2013). An absolute scale is not used in children; instead, a percentile scale is used based on the child's age and sex (ICSI, 2013).

2. The appropriate terminology for BMI for children ages 2 to 18 is as follows:
    - "Underweight" for children with a BMI at less than the 5th percentile
    - "Healthy weight" for children with a BMI from the 5th to the 84th percentile
    - "Overweight" for children with a BMI from the 85th to the 94th percentile
    - "Obesity" for children with a BMI greater than or equal to the 95th percentile.
3. Clinical Practice Guideline- statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options (National Guideline Clearinghouse, 2011).
4. 5210 program- is a nationally recognized weight management strategy aimed specifically at childhood obesity (Institute for Clinical Systems Improvement, 2013).
5. Laboratory testing- a procedure, usually conducted in a laboratory, that is intended to detect, identify, or quantify one or more significant substances, evaluate organ functions, or establish the nature of a condition or disease (Merriam-Webster Dictionary, n.d.).
6. Education- the knowledge and development resulting from an educational process (Merriam-Webster Dictionary, n.d).

7. CE (continuing education)- an instructional program that brings participants up to date in a particular area of knowledge or skills (Merriam-Webster Dictionary, n.d).
8. Nurse Practitioner- advanced practice registered nurses (APRN) who are educated and trained to provide health promotion and maintenance through the diagnosis and treatment of acute illness and chronic conditions (Merriam-Webster Dictionary, n.d).
9. Self-report- a report about one's behavior provided especially by one who is a subject of research (Merriam-Webster Dictionary, n.d).

Logic Model

The logic model for this project was designed to show the relationships between inputs and resources available in order to create and provide an intervention. It also illustrates the activities the intervention offers and the expected results. The logic model (Figure 2) identifies the short-term, medium-term, and ultimate outcomes for the project. It is broken down into short-term, medium-term and long-term goals and recognizes the influence of external factors and assumptions.

Short-term outcomes of this project include providers' accurate identification of diagnostic criteria for obesity and overweight, accurate selection of appropriate laboratory testing, increased knowledge of the 5210 program components, and accurate identification of comorbidities associated with obesity and overweight. For the purpose of this project, short-term goals were evaluated utilizing a pretest and posttest format. Medium-term outcomes include increased self-efficacy, increased usage and knowledge of the guidelines, and improved assessment and treatment of obesity. The medium term

outcomes were assessed with a six week post education survey to evaluate self-reported practice changes within the providers' practice. The final long-term outcome and the central focus of the project is to have a decrease in the prevalence of childhood obesity and initiate a practice change of providers. Long-term outcomes were not able to be assessed in the time frame allowed for this project. The following are assumptions of the logic model:

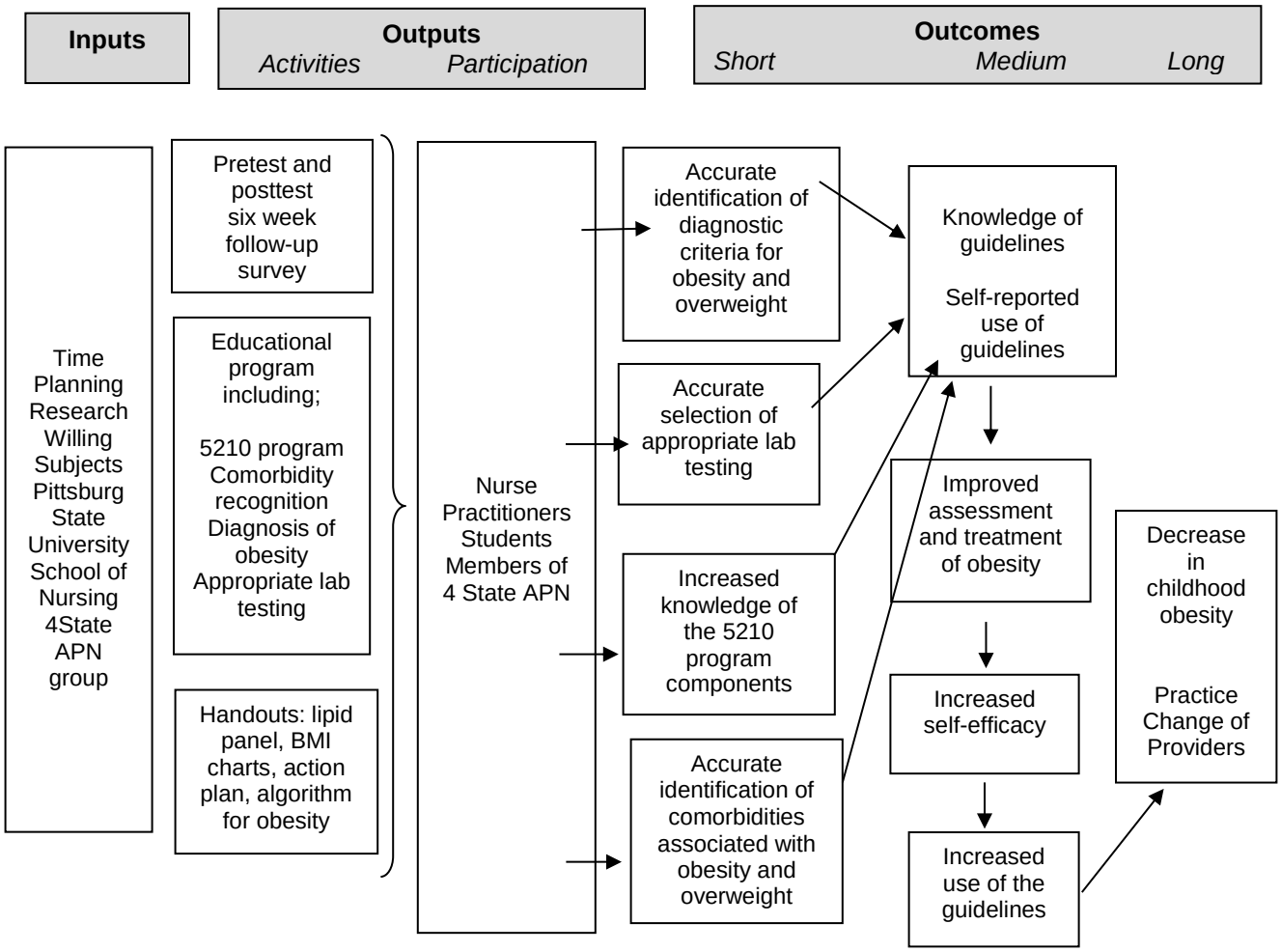
1. Providers utilized the current practice guidelines once given education.
2. The test questions were answered to the best of the subject's ability and by not looking up answers.
3. The test was an accurate assessment of providers' knowledge with current practice recommendations.
4. Providers have a basic knowledge of childhood obesity and were able to understand the material without difficulty.
5. The testing accurately reflected the population studied.

External factors of the model include possible barriers and limitations. The following are limitations of the study:

1. Findings apply to the participants surveyed and may not be generalized to other populations.
2. The primary investigator correlated results at six weeks post education with a survey and self-reported perceptions and not actual chart audits.

Figure 2:

Childhood Obesity Guidelines Logic Model



Assumptions

Participants will utilize guidelines once educated
Participants will answer questions to the best of their ability
The test will be an accurate assessment of current recommendations
Participants will have a basic knowledge of childhood obesity and be able to understand the material without difficulty
The participants will accurately reflect the population studied

External Factors

Findings will apply to the participants surveyed and may not be generalized to other populations
The primary investigator will correlate results at six weeks post education with a survey and self-reported perceptions and not chart audits.

Summary

Childhood obesity is an increasing health concern. Primary care providers have the ability to combat this growing problem. Many studies have been done evaluating the long term health, social, and financial effects of obesity on children. New guidelines were initiated in 2007 to help providers diagnose and manage the disease. However, studies continue to show that guidelines are not being followed and increased provider education is needed. Chapter II presents a review of literature on the subject of childhood obesity and provider practices. It details why it is important for providers to evaluate and initiate proper diagnosis and care.

Chapter II

Literature Review

A review of literature was performed through multiple online databases. It identified relevant and significant peer-reviewed journal articles related to childhood obesity and the use of clinical practice guidelines. Even though information and research has been available for the last thirty years attempting to understand, treat, and prevent childhood obesity in the United States, the search was limited to a period of five years in order to provide the most accurate, up-to-date information. Search phrases used to retrieve appropriate articles included "childhood obesity," "providers' knowledge of current clinical practice guidelines in childhood obesity," "comorbidities and childhood obesity," "laboratory evaluation and childhood obesity," "CME," and "primary care providers' use of current clinical practice guidelines in childhood obesity." The websites of the Centers for Disease Control and Prevention and the National Institutes of Health were consulted for current statistics and up-to-date information. The preliminary search utilized the following keywords:

- Childhood Obesity
- Interventions
- Primary Care
- Clinical Practice Guidelines

- Knowledge
- Accuracy
- Education
- CME

Utilizing these keywords 42 articles were identified as possible articles for analysis. Of the articles identified, the following criteria was used to narrow the range of articles utilized for analysis:

- Published in the last five years
- Children ages 2-18 years
- Interventions: Provider targeted
- Performed in the United States

Thirty-seven studies/meta-analyses met the inclusion criteria for analysis. This review summarizes some of the key interventions studied by the articles selected.

Practice Change Guidelines

Selection of Best Practice Guidelines

This project provided an educational intervention to providers based on expert recommendations, evidenced-based practice (EBP) and the Chronic Care Model (CCM). It will contribute to an increase in provider knowledge and accuracy with current evidence-based clinical practice guidelines providing a subsequent decrease in childhood obesity rates. The purpose of the implementation bundle adapted from the Institute for Clinical Systems Improvement (ICSI) guidelines is to assess whether delivering education regarding current clinical practice guidelines will provide an increase in the knowledge and accuracy of those guidelines. The implementation bundle provided the

basis for the educational program, the pretest and posttest questions, and the questions regarding providers perceived practice changes.

Multiple databases were searched including the National Guidelines Clearinghouse (NGC), Registered Nurse Association of Ontario (RNAO), Agency for Healthcare Research and Quality (AHRQ), National Institute for Children's Healthcare Quality (NICH) and Institute for Clinical Systems Improvement (ICSI). Through this search, the ICSI guidelines for Prevention and Management of Obesity for Children and Adolescents were selected as the basis for the education. The AGREE II instrument was used to appraise the quality of the CPG (AGREE Next Steps Consortium, 2009). The rating scheme that is applied is the Grading of Recommendations Assessment Development and Evaluation (GRADE) system. This CPG contained 40 total practice recommendations. This AGREE II evaluation identified the CPG as one that is moderately high in quality of evidence and strong in strength of recommendations. Out of the 36 practice recommendations, 13 were selected to be placed within the educational program with emphasis on prevention, assessment, laboratory testing, and comorbidity assessment. The recommendations that were not included in the education focused on nutrition and behavior management. While those recommendations are important, it was beyond the scope of this project to include them all. The recommendations selected were based on the literature review and research that pointed towards diagnosis as the most important step as an indicator for treatment.

Practice Change Recommendations for Implementation

Prevention and Management of Obesity for Children and Adolescents contain seven topics with 40 practice recommendations. The recommendations address screening,

diagnosis, prevention, and treatment. A total of 13 specific recommendations were selected for implementation (Table 1). The following categories of recommendations are included in the educational program: prevention (anthropometrics evaluations and 5210 program), screening and diagnosis (laboratory testing and BMI), and assessment of comorbid conditions. Prevention, screening, and diagnosis include five recommendations, and assessment for comorbidities includes three recommendations.

Table 1:

Summary of Prevention and Management of Obesity for Children and Adolescents

Prevention	1. An assessment of diet, physical activity, and sedentary behaviors should be done annually, preferably at a well-child visit. This assessment should be used to target appropriate messages to each family (Quality of Evidence-High) (Strength of Recommendation-Strong). 2. Obesity prevention messages should be targeted for all families, starting at the time of the child's birth (Quality of Evidence-High) (Strength of Recommendation-Strong). 3. Clinicians may suggest that children get at least 60 minutes of moderate exercise daily (Quality of Evidence-Moderate) (Strength of Recommendation-Strong). 4. Use of the 5210 program (Quality of Evidence-High) (Strength of Recommendation-Strong). 5. Clinician should counsel children and families to:

	Limit their child's consumption of sugar sweetened beverages; Eat a diet with the recommended quantities of fruits and vegetables; Eat breakfast daily; Eat meals together as much as possible; Limit eating out, especially at fast food restaurants; Adjust portion sizes appropriately for age; Avoid television for children under the age of two; and Limit television and "screen time" to less than two hours per day (Quality of Evidence-High) (Strength of Recommendation-Strong).
Screening and Diagnosis	1. All children ages 9-11 should be universally screened for dyslipidemia using either a non-fasting total cholesterol or a fasting lipid profile. At other ages, a fasting lipid profile should be done if indicated by family history and/or risk factors (Quality of Evidence-High) (Strength of Recommendation-Strong). 2. Body mass index (BMI) should be calculated and documented in the medical recorded on all children ages 2-18 at least annually (Quality of Evidence-High) (Strength of Recommendation-Strong). 3. CDC growth charts should be used for children ages 2-18; WHO growth curves should be used from birth through 23 months of age (Quality of Evidence-High) (Strength of Recommendation-Strong). 4. Health risk that increase the likelihood of obesity and/or related comorbidities should be assessed for at least annually

	(Quality of Evidence-High) (Strength of Recommendation-Strong). 5. Appropriate terminology should be used to classify pediatric overweight and obesity (Quality of Evidence-High) (Strength of Recommendation-Strong).
Assess for major and minor comorbid conditions.	1. Clinicians should obtain focused family history of obesity and type 2 diabetes mellitus (DM) and cardiovascular disease (CVD) in first- and second-degree relatives to assess the risk of current and future comorbidities associated with the patient's weight status (Quality of Evidence-High) (Strength of Recommendation-Strong). 2. Clinicians should obtain laboratory and radiographic evaluations depending on age, BMI, and physical and historical findings. Clinicians should also consider the likely impact on treatment strategies of the results obtained. If results are unlikely to alter treatment, then the value of the testing may be limited (Quality of Evidence-Moderate) (Strength of Recommendation-Strong). 3. Clinicians should conduct a focused review of systems and physical examination to identify potential weight-related comorbidities (Quality of Evidence-High) (Strength of Recommendation-Strong).

Reproduced from Institute for Clinical Systems Improvement, July 2013, p. 5-8.

Assessment Algorithm

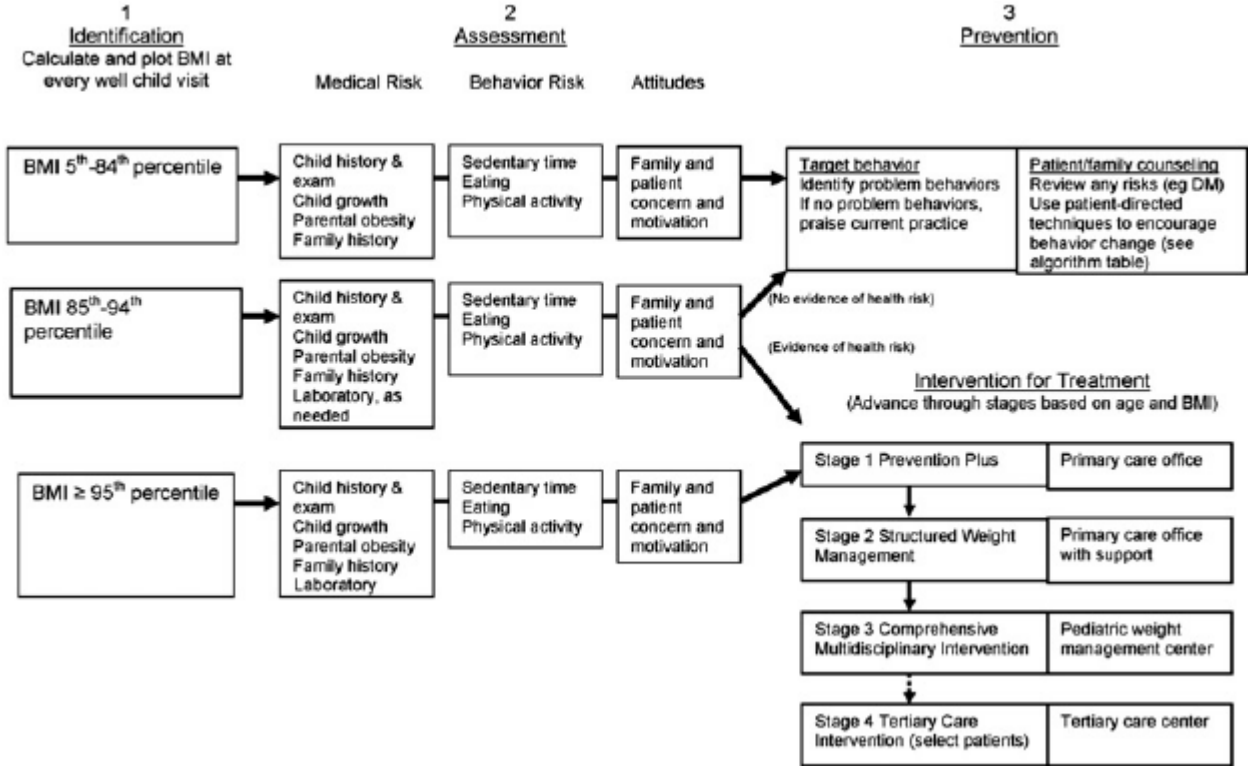
The ICSI has implemented a universal assessment of obesity risk in an easy to understand format. There are three assessments to be reviewed: medical risk, behavior risk, and attitudes for change (Institute for Clinical Systems Improvement, 2013).

Medical risk includes an assessment of parental obesity or other family members with obesity (Institute for Clinical Systems Improvement, July 2013). The cause of overweight and obesity has a genetic predisposing background (Baker, Farpour-Lambert, Nowicka, Pietrobelli, & Weiss, 2010). Behavior risk includes information about physical activity, screen time, and eating behaviors (Institute for Clinical Systems Improvement, 2013). Attitudes for change include assessing both the parents and child's concern for weight and targeting what they are interested in changing (Institute for Clinical Systems Improvement, 2013).

When combined with the current practice guidelines, obesity can be assessed and treated appropriately utilizing the assessment algorithm. Medical risks include recommendations based on assessment of comorbidities, laboratory work-up if indicated, history, and exam. It focuses on the recommendations in the screening and diagnosis and comorbidities section of the implementation bundle and ICSI guidelines. Behavior risk assessment emphasizes the appraisal of diet, physical activity, sedentary behavior, and the 5210 program components. Those recommendations are found in the prevention section of the implementation bundle. Attitudes take into account family and patient concern and motivation. Those recommendations are part of the guidelines and are covered in the readiness to change and motivational interviewing section of the implementation bundle. Institute for Clinical System Improvement suggest the use of a universal algorithm (Figure 3) to assess for obesity risk and identify steps for prevention and treatment.

Figure 3:

Universal Assessment of Obesity Risk and Steps to Prevention



(Institutes for Clinical Systems Improvement, 2013)

Medical Risk

Screening and Diagnosis

Many health care providers fail to diagnose overweight or obesity in pediatric patients due to failure to use an accurate measure. The ISCI guideline supports the use of body mass index as the appropriate scale for determination of weight status, which is also the recommendation of the American Academy of Pediatrics. Plotting the BMI percentile on the growth chart is the initial step and essential to correctly identify adiposity (Savinon et al., 2012). Overweight is defined as a BMI in the 85th percentile and obese as a BMI greater than the 95th percentile. The CDC recommends using BMI percentile for diagnosing overweight and obesity in children following the 2007 Expert Committee

Recommendations (Harkins, Lundgren, Spresser, & Hampi, 2012). Recommendations state that the term obesity not be used in children between the ages of 0-2; at this age, children over the 95th percentile are considered overweight. The current evidenced-based practice guidelines are centered on the ages of 2-18. These recommendations all follow the same diagnostic guidelines using percentiles. The Expert Committee Recommendations have become the standardized diagnosis for obesity and follow the parameters set forth by the CDC. According to the Expert Committee Recommendations and the ICSI guidelines all children should have body mass index calculated and documented in the medical record at least annually (Institute for Clinical Systems Improvement, 2013; Jacobson & Gance-Cleveland, 2010). It is important to recall that children between the ages of 4-6 will have a decrease in adiposity which will then rebound as they get older (Institute for Clinical Systems Improvement, 2013). If a child in this age group does not show this decrease, they may be at a higher risk for obesity or overweight as they get older (Institute for Clinical Systems Improvement, 2013). For children, waist circumference is not currently recommended for use in the clinical setting in the diagnosis of obesity and overweight (Institute for Clinical Systems Improvement, 2013).

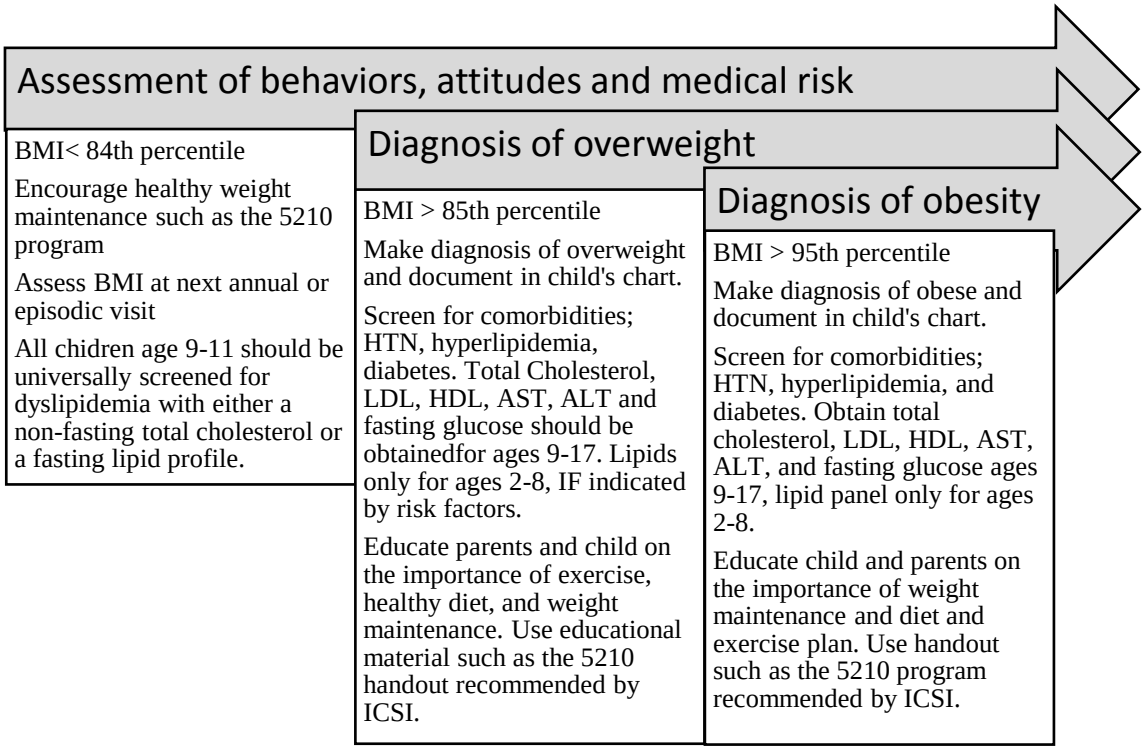
Specific recommendations were made regarding lifestyle counseling, laboratory screening, and comorbidities in 2007 by the Expert Committee (Nader, Singhal, Javed, Weaver, & Kumar, 2014). Providers should consider what treatment strategies will be used and the ability to accurately interpret laboratory values based on the evidenced-based recommendations for children before testing is obtained. If the test result is unlikely to alter treatment, then the value of the testing must be considered. Children with

a BMI higher than 95% should have a measurement of fasting lipid panel, fasting glucose, alanine aminotransferase (ALT), and aspartate aminotransferase (AST) starting at age nine (Nader et al., 2014). The ALT and AST are markers of liver damage. The testing should be done every two years (Nader et al., 2014). Screening of lipid levels should begin at age two and go to age nine if over the 95th percentile, or if between the 85th and 94th percentile with a family history of dyslipidemia or another high risk condition (Institute for Clinical Systems Improvement, 2013). Children ages 9-17 with a BMI over the 85th percentile should have a fasting lipid panel, fasting glucose, AST and ALT drawn (Nader et al., 2014). If fasting is a barrier to lipid testing, it should be done non-fasting. A large nationally representative study performed by Steiner (2005) and cited in the ICSI guidelines state that it makes only a small and likely clinically insignificant difference in results (Institute for Clinical Systems Improvement, 2013). The differences in total cholesterol, HDL and LDL were 2-5 mg/dl and triglycerides were 7 mg/dl higher overall (Institute for Clinical Systems Improvement, 2013). Thyroid testing, including thyroid stimulating hormone (TSH) is not recommended unless other symptoms are present (Nader et al., 2014). A TSH is recommended only if symptoms of hypothyroidism exist, if the child has a decreased height velocity, or if significant family history of thyroid disease is noted in the health history (Institute for Clinical Systems Improvement, 2013). Also not recommended by the ICSI guidelines is a hemoglobin A1c or oral glucose testing in the evaluation of obesity and overweight unless symptoms are present. In a study performed by Nader et al. (2014) only one-third of eligible children in 2009 underwent the recommended screening for diabetes, nonalcoholic fatty liver disease, and lipid disorders. An easy to follow algorithm for the screening and diagnosis

of overweight and obesity based on current evidenced-based practice guidelines from ICSI and a literature review is presented below (Figure 4).

Figure 4:

Algorithm for Screening and Diagnosis



(Adaptation from the Institutes for Clinical Systems Improvement, 2013)

Assessment of Comorbidities

The recommendation of the Expert Committee and the ISCI is to evaluate children with a BMI in at least the 85th percentile for associated comorbidities and complications such as diabetes, dyslipidemia, and hypertension. Providers should obtain a family history focused on obesity, type 2 diabetes mellitus (DM), and cardiovascular disease (CVD) in first- and second-degree relatives to assess the risk of current and future

comorbidities associated with the patient's weight status (Institute for Clinical Systems Improvement, 2013). This guideline serves as a resource for providers in the identification and early detection of children who are overweight and/or obese and the diagnosis and treatment of possible comorbidities. The majority of providers admit to "always" or "sometimes" asking patients or families about history or complications of obesity (Rausch, Perito, & Hametz, 2011). Questions related to diabetes were asked 84% of the time, cardiovascular disease 86% of the time and early deaths from heart disease 68% of the time. Symptoms of obesity were investigated less than half the time by providers including depression and anxiety, snoring, daytime sleepiness, headaches, hirsutism, hepatomegaly, and hip/knee pain. Acanthosis Nigerians was the most common sign assessed for at 84% (Rausch et al., 2011). By the age of ten, 60% of overweight children will have at least one biochemical or clinical cardiovascular risk factor, with 25% having more than two (Walpole et al., 2011). If the BMI is over the 95th percentile for weight, almost 40% of adolescents have two or more risk factors for cardiovascular disease and almost 20% have three or more (Shreve, 2015). Approximately one-third of children born in 2000 will develop type 2 diabetes (Walpole et al., 2011).

A strong association exists between childhood obesity and early onset dyslipidemia, hypertension, and insulin resistance (Raghuveer, 2010). Dyslipidemia manifests in children as high triglycerides and usually a combination of high total and low density lipoprotein (LDL), low high density lipoprotein (HDL), and high very low density lipoprotein (VLDL) (Raghuveer, 2010). Vascular abnormalities can be observed in children in the first year of life (Barton, 2012). Childhood obesity has also been linked to low vitamin D levels (Raghuveer, 2010). Studies have shown that high total

cholesterol, high BMI, and high LDL are associated with an increased carotid artery intima-media thickness (CIMT), which is a marker of atherosclerosis and heart disease (Raghuveer, 2010). That same study also found these children had adverse vascular effects into adulthood (Raghuveer, 2010). Barton (2012) found that inflammation plays a role in insulin resistance and metabolic changes with obesity. Obesity increases the CIMT and tissue levels of endothelin-1 (Barton, 2012). She concluded, based on the inflammatory process, obesity can be considered a process that accelerates aging and in turn explains the accelerated atherosclerosis in children (Barton, 2012). Children with premature acceleration of atherosclerosis need to have diet modification and possible intensive statin therapy to lower cardiovascular related burdens (Raghuveer, 2010).

The most impressive study on comorbidities associated with childhood obesity was performed by Franks et al. (2010). The study addressed the extent in which obesity, glucose intolerance, hypertension, and hypercholesterolemia without diabetes predicted premature death in children. Premature death was defined by the study as death before 55 years of age (Franks et al., 2010). The study was limited in that it only included children from Arizona that were American Indians (Franks et. al, 2010). Death from endogenous causes among children in the highest quartile of BMI were more than double of those among children in the lowest BMI quartile (Franks et al., 2010). Children with glucose intolerance were 73% more likely to die from endogenous causes than children in the lowest quartile for weight (Franks et al., 2010). Childhood hypertension along with placement in the highest BMI quartile was found to be associated with premature death by endogenous causes 57% of the time (Franks et al., 2010). Children with hypertension along with placement below the highest BMI quartile found no increased rates of

premature death due to endogenous causes (Franks et al., 2010). This study found that children without a diagnosis of diabetes or hypertension, but diagnosed with obesity, will have an increased rate of premature death from endogenous causes (Franks et al., 2010).

Obesity research in children is currently investigating if a relationship exists between obesity and metabolic syndrome (MS) (Rodriguez et al., 2010). Metabolic syndrome has been associated with an increased risk of non-alcoholic fatty liver disease (NAFLD) (Rodriguez et al., 2010). The metabolic abnormalities associated with obesity increases the risk of cardiovascular disease and complications (Rodriguez et al., 2010). There has been a direct association between obesity and NAFLD in children and obesity and metabolic syndrome. Approximately 35% of obese children have NAFLD. Metabolic syndrome is found in more than 50% of children with NAFLD. The complications that can arise include end stage liver disease in early adolescence. NAFLD has become one the most common forms of liver disease in children and adolescents (Rodriguez et al., 2010).

Behavior Risk

Prevention

An assessment of diet, physical activity and sedentary behaviors should be done annually, preferably at a well-child visit (Institute for Clinical Systems Improvement, 2013). This assessment should be used to target the necessary needs of each family (Institute for Clinical Systems Improvement, 2013). Physical activity and television time recommendations were found to be addressed "sometimes" at yearly visits (22% of the time) "often" (38% of the time) or "always" (35% of the time) by providers (Harkins et al., 2012). Prevention begins with children who have a BMI between the 5th and 85th

percentile; those children are considered to be a healthy weight and should have an assessment and screening done annually (Sample et al., 2013).

Sedentary behavior and low levels of activity have been found to contribute to childhood obesity (Steele et al., 2010; Barton, 2012). Sixty minutes of physical activity is recommended by multiple organizations and in current evidenced-based practice guidelines (Steele et al., 2010). It has been shown that children who engage in over four hours of screen time can still be very physically active and not considered overweight or obese (Steele et al., 2010). A study by Steele et al. (2010) found that encouraging high levels of weekend activity may hold the most possibilities in trying to combat childhood obesity and the recommendations should be made to all children regardless of weight status. Pavon, Kelly, and Reilly (2010) performed a systematic review over four years that included 48 cross-sectional studies. They found consistent evidence of negative associations with minimal physical activity and high BMI. Seventy-nine percent of the studies reported a negative association between obesity and decreased physical activity. Based on this study increased physical activity on a regular basis appeared to be protective against childhood obesity and adiposity (Pavon et al., 2010).

5210 Guidelines

The 5210 program is a nationally recognized weight management strategy aimed specifically at childhood obesity. It is widely endorsed by the American Academy of Pediatrics and can be used by primary care providers for weight-based management goal setting. The International Clinical Systems Improvement guidelines include the 5210 program as a preventative strategy. The 5210 program has been shown to be an effective foundation in sustainable behavior change (Institute for Clinical Systems Improvement,

2013). Literature supports a comprehensive approach to influencing dietary habits of young children and prevention interventions that start early in childhood (Berkowitz & Borchard, 2009). Once poor dietary habits are established it is difficult to break the cycle. The 5210 program for daily healthy habit goals include:

5- Five or more fruits and vegetables

2-Two hours or fewer recreational screen time

1-One hour or more of physical activity

0-Zero sugary drinks, more water and only low-fat milk

(Institute for Clinical Systems Improvement, 2013).

Attitudes

Readiness to Change/Motivational Interviewing

The Expert Committee suggests assessment of parent and child readiness using motivational interviewing and readiness to change. Providers admitted to asking about readiness to change approximately 73% of the time (Wong & Chen, 2013). Readiness to change is an important factor with both parents and children. Studies have shown that without parental support and confidence, premature drop-out rates with weight loss efforts are increased (Gunnarsdottir, Njardvik, Olafsdottir, Craighead, & Bjarnason, 2010). Lack of parental confidence and high drop-out rates are related to poorer outcomes. Parental confidence and readiness are useful since it is a predictor of drop-out rates and allows for early identification of those at-risk families (Gunnarsdottir et al., 2010).

Motivational interviewing (MI), a "client-centered directive method of therapy for enhancing intrinsic motivation to change by exploring and resolving ambivalence"

(Walpole, Dettmer, Morrongiello, McCrindle, & Hamilton, 2011, p. 1), has been found to be an effective intervention for weight loss in children (Wong & Cheng 2013) and is promoted throughout the clinical practice guidelines. In Wong and Cheng's study (2013) utilizing motivational interviewing as an interventional tool, children in the MI group showed significant improvement in weight-related behaviors and anthropometric measures compared to the control group, which had a deterioration in anthropometric measures. Through MI, providers can help motivated patients identify specific, measurable, and realistic goals to decrease calorie intake and increase physical activity.

Provider Diagnosis

Studies demonstrated that providers are not diagnosing obesity in children. One study found that although 19.5% of children have a BMI indicative of an overweight or obese diagnosis, only 7% had a documented overweight or obese ICD-9 code (Walsh, Milliren, Feldman, & Taveras, 2013). Only 15.2% had a positive response documented to provider questions such as "Does the patient now have obesity?" (Walsh et al., 2013). The diagnosis of overweight or obesity in the medical record has been proven to increase treatment and improve outcomes. Physicians in one study admitted to being adherent to only 60% of the recommended guidelines (Harkins et al., 2012). In 2002, Barlow et al., reported only 19% of pediatricians used BMI (Sesselberg et al., 2010). Documentation of obesity was again found in this study to increase counseling and referral rates (Sesselberg et al., 2010).

Respondents to a survey by Rausch, Perito, & Hametz (2011) found that although providers are checking BMI at a 90% rate, they were not using the correct BMI percentile cutoffs as diagnostic criteria. Less than 50% of the attending physicians and less than

10% of interns used the recommended criteria for diagnosing overweight (Rausch et al., 2011). Forty-eight percent of attending physicians and less than 25% of interns used the correct recommended criteria for obesity (Rausch et al., 2011). Even though the diagnosis of obesity is increasing, almost half of children in 2009 were not diagnosed, and only one in six children were given the diagnosis of overweight (Nader et al., 2014). Another study found that only 28% of obese children were diagnosed and 5% of overweight children were identified on the medical record (Jacobson & Gance-Cleveland, 2010). A chart audit from that same study indicated that only 1% of children at a well-child visit had a documented diagnosis of obesity (Jacobson & Gance-Cleveland, 2010). Overall studies of current practice have indicated a low use and documentation of BMI percentiles for identifying overweight and obese children.

Factors that can contribute to low rates of obesity diagnosis include lack of familiarity with the guidelines, revised definitions of overweight and obesity and insufficient time available for counseling (Nader, Singhal, Javed, Weaver, & Kumar, 2014). Not assessing BMI can lead to missed diagnosis of overweight/obesity and may cause providers to under screen for associated comorbidities. Based on the small percentage of documented diagnoses in relation to BMI, determining providers' knowledge of and accuracy of use with recommended guidelines is a necessity. Not only is assessing BMI important, but making the diagnosis can also aid in follow-up care and maintenance. Previous studies report the rates of diagnosis of obesity and overweight ranging from 18% to 54% (Nader et al., 2014). Children with a diagnosis of obesity were 8.8% more likely to receive weight-related counseling than those without a diagnosis.

Provider Barriers

Many studies addressed perceived barriers identified by providers preventing them from following current evidenced based practice guidelines. Primary care providers in one study found that barriers fell into five distinct categories (Findholt, Davis, & Michael, 2013). The barriers can be related to practice, the clinician, the family and/or patient, the community, and the sociocultural environment. Barriers related to practice included time constraints, lack of reimbursement, and few opportunities to detect obesity (Findholt et al., 2013). The clinician also listed limited knowledge as a barrier (Findholt et al., 2013). The family and patient barrier includes lifestyle and lack of parental motivation to change, low family income, and lack of health insurance (Findholt et al., 2013). Community barriers were listed as lack of pediatric subspecialists and multidisciplinary/tertiary care services and few community resources (Findholt et al., 2013). Sociocultural barriers included known sociocultural influences and a high prevalence of childhood obesity within the culture (Findholt et al., 2013). Provider lack of knowledge, discomfort with counseling, and lack of time were listed as barriers in a study by Sample et al. (2013).

Six barriers listed in another study were rated by 90% of providers to be important for improving the health and lifestyle of children (Spivack, Swietlik, Alessandrini, & Faith, 2010). Barriers included: parent is not motivated to change diet or lifestyle; child is not motivated to change diet or lifestyle; parents are overweight, and therefore are not concerned that the child is overweight; families often have fast-food meals; families watch too much TV; and families do not get enough exercise (Spivack et al., 2010). These studies show that multiple barriers exist from the clinician to the patient that can

hinder the appropriate care of obese and overweight children. Rubin (2011) cites similar barriers to providing appropriate care. Insufficient time, lack of specialist, lack of patient and parental involvement, lack of patient motivation, and lack of support services seem to be a trend in providing obstacles for treatment.

Provider Practice

Despite publications and readily available guidelines, providers are not knowledgeable about current recommendations. Translating the extensive recommendations into practice is also a challenge. Providers stated that if educational materials were provided 95% of them would be willing to use them in practice and spend an additional one-minute discussing diet, nutrition and exercise (Spivack et al., 2010). Ninety-six percent would utilize a web site or handouts for patients related to diet, nutrition, exercise, and portion size (Spivack et al., 2010).

Treating obesity is frustrating to many providers. One-fourth of providers describe themselves as either not at all or only slightly competent in managing childhood obesity (Rubin, 2011). Less than 30% of respondents felt they had adequate time or resources to manage childhood obesity with 90% feeling it was frustrating. Only 2.9% felt effective in their management (Rubin, 2011).

Awareness of the current guidelines was reported by 70% of physicians in one study (Harkins et al., 2012). In that same study, they admitted to only adhering to 60% of the recommendations (Harkins et al., 2012). Studies of current practices revealed low use and documentation of BMI, even though studies show that the use and diagnosis of obesity is one of the highest indicators of treatment (Harkins et al., 2012). Providers indicate a strong desire to address the problem but also indicate a low confidence level in

effectiveness (Haemer et al., 2011). A study performed by Haemer et al. (2011) stated that primary care providers are hesitant to screen and diagnose obesity because of their lack of confidence in providing care for the children. That same study found that training proved successful in changing primary care practice (Haemer et al., 2011). Practice change interventions should include assessment of weight status and history, comorbidity assessment, counseling, motivational interviewing and readiness to change, treatment staging, and referral if needed (Haemer et al., 2011). Practice changes have been found to be effective when modeled around the chronic care model (Haemer et al., 2011).

Summary

Providers must attain the knowledge and skills associated with childhood obesity in order to meet the needs of the children for whom they provide care. Proper assessment and management is necessary to combat this chronic health problem. Management of childhood obesity in a primary care clinic is a frustrating task with multiple barriers. Increasing knowledge of providers can help alleviate some of those barriers and make the diagnosis and management of obesity an easier task.

Prevention and treatment of childhood obesity is a complex and burdensome process that includes many facets of care. Appropriate screening, family and child readiness, behavior, diet and physical activity modifications, comorbidity assessment, and proper diagnosis are needed to provide an appropriate level of care. Many providers lack the time and resources to accomplish this within a typical clinic setting as summarized by some of the common barriers. Chapter III covers the methodology of the research study along with the protection of human subjects, instruments, procedures, and outcome measures.

Chapter III

Project Design

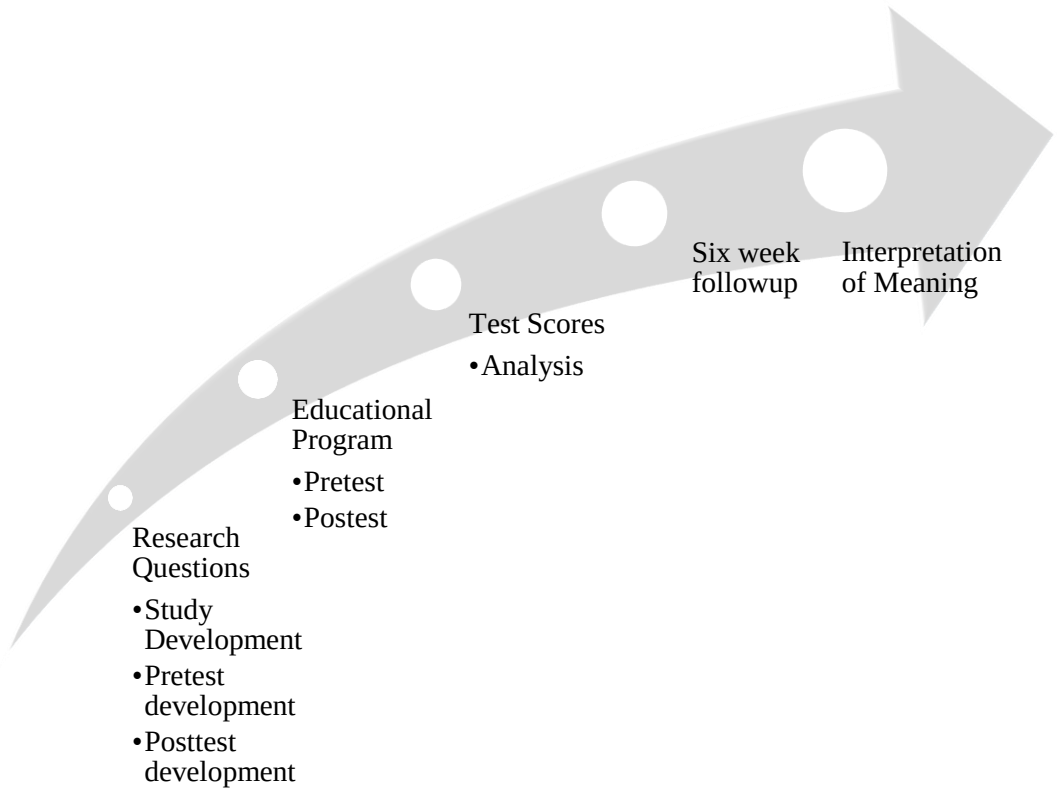
This chapter will discuss the design for the research study. It also describes the sample group, instrument used and statistical analysis. A two-part study was performed to evaluate whether an increase in knowledge and accuracy of providers with current evidenced-based clinical practice guidelines in childhood obesity and overweight occurred after education was provided and if it was maintained six weeks post education. The study used quantitative data for measurements of the participant's knowledge and accuracy with current diagnostic criteria based on clinical practice guidelines. Informational data was obtained with a six week self-reported survey which evaluated if a perceived practice change occurred by participants. A quantitative approach was utilized for the project to test the impact of the intervention. A quasi-experimental design with a pretest/posttest application was chosen for this study based on feasibility and time constraints. One of the most useful advantages of the quantitative research design is the ability to provide statistical significance. With a quantitative design data is gathered using an objective approach (Terry, 2015). That allows the researcher to not become emotionally involved with the participants or project (Terry, 2015).

Descriptive research was the most direct and economical choice to begin to understand how childhood obesity is assessed by providers. Even though there is no

control group or randomization, the study provided valuable information to participants with education on current evidenced-based clinical practice guidelines. The education was provided during the 20th annual 4-State APN (advanced practice nurse) conference. Upon completion of the education and posttest one continuing education credit was awarded by the American Academy of Nurse Practitioners. The study included a pretest with demographic data for characterization of the group, current provider practice, and clinical practice guidelines questions. The posttest had the same clinical practice guideline questions as the pretest. The six week follow-up survey included current provider practice questions. Following the educational program, a six week follow-up survey was sent out via email to evaluate whether a perceived practice change occurred. The study design is presented below (Figure 5).

Figure 5:

Study Design



An educational program was implemented to nurse practitioners and nurse practitioner students at a local conference in Southwest Missouri in order to evaluate whether an increase in knowledge and accuracy occurred based on questions related to specific indicators of childhood obesity. It challenged the participants' knowledge and sought to discover if increased accuracy with evidenced-based guidelines occurred after the educational program presentation. Following the educational presentation, a

follow-up survey was distributed via email to gauge whether the participants self-reported a perceived practice change.

The study focused on the following research questions:

1. Will education increase the accuracy of providers when identifying diagnostic criteria based on current practice guidelines for childhood obesity/overweight?

2. Will education increase the accuracy of providers when selecting appropriate lab testing for children based on current practice guidelines for childhood obesity/overweight?

3. Will education increase the providers' knowledge of the 5210 program components?

4. Will education increase the accuracy of providers when identifying comorbidities associated with obesity/overweight?

5. Will providers have a self-reported increase in diagnosis of overweight and obesity six weeks post education?

6. Will providers have a self-reported increase in ordering recommended laboratory testing for children that are overweight/obese six weeks post education?

7. Will providers have a self-reported increase in assessment of comorbidities for overweight/obese children six weeks post education?

Settings and Participants

The population for this research study included nurse practitioners and nurse practitioner students. All participants, including students at the conference, were eligible to participate in the educational portion of the study with the pretest/posttest. The

follow-up survey was distributed to only those nurse practitioners in family practice who provide care for children. They were required to have a valid nurse practitioner license and provide an email address for participation. The age of the subjects was unimportant other than being over the age of 18 due to the nature of the study. It is important to measure the current knowledge of the providers related to evidenced-based clinical practice guidelines on childhood obesity in order to increase appropriate identification and treatment. This group of providers will be able to benefit from the knowledge learned during the program and utilize it in daily clinical practice.

Recruitment

The target population was recruited from the annual 4-State APN nurse practitioner conference. The 4-State APN is a local professional group with over 100 members and holds an annual educational conference in March. The conference was held at the Mercy conference center at Mercy Hospital in Joplin, MO. The educational presentation was part of a two-day conference and provided one CE credit approved by the American Academy of Nurse Practitioners. It was voluntary in nature with no compensation provided to participants. Although participation in the study was voluntary, all in attendance at the presentation received the continuing education credit. Participation in the study was accepted with completion of the pretest, posttest, and email address to complete the six week follow-up survey.

Inclusion/Exclusion Criteria

Inclusion criteria for the pretest/posttest portion of the study included all participants at the conference. For inclusion in the six week follow-up, a current valid license as a nurse practitioner in family practice was required. The participant was also

required to provide care to children, though a specific percentage or number was not required. The participant must be over the age of 18 for the purpose of this study. No other inclusion criteria were needed.

The local conference invites nurse practitioner students, but since they do not currently practice, they were not included in the six week follow-up study sample. The participant must be a nurse practitioner. Medical doctors, doctors of osteopathy, clinical nurse specialist, or physician assistants did not qualify for this study. No other exclusion criteria were identified.

Protection of Human Subjects

The researcher reviewed the checklist for human subjects and determined that the study adhered to Pittsburg State University human subjects and departmental guidelines for an exempt study. The human subject committee at Pittsburg State University reviewed and approved the process for the study. The research fell under exempt status. The subject population is adult nurse practitioners over the age of 18. It does not contain vulnerable subjects: children, prisoners, or specific populations of race, religion, or ethnicity. No deception of subjects took place or techniques that caused discomfort or harassment. Confidentiality was maintained with coding of the questionnaires/surveys. There were no risks associated with the study questionnaire. The responses of the subjects will not be disclosed outside the research that could reasonably place them at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

Data was obtained for this study through participants volunteering for the study. Completion of the pretest and posttest provided consent for the study. Confidentiality was

maintained regarding all information obtained though out the pretest/posttest. The data was utilized for the purpose of this research. Information collected contained no identifying factors of the participants. Completed questionnaires will be kept in a locked box assessable only by the primary investigator and will be shredded at the completion of the project and program.

Ethical Considerations

Potential ethical considerations for this project are few. The project design is a pretest/posttest descriptive study, along with a follow-up survey with an educational component. Therefore, the ethical considerations are centered on the questionnaire development and the answers provided. The first concern is anonymity. It is important to record and store information without a name or identifier so the participants cannot be identified in any way by anyone. The second concern is the participant providing false information and intentionally departing from the designed interviewer guidelines that could result in the contamination of the data. The ethical concern can be the participant fabricating all or part of the answers or providing information that is not consistent with the current way they practice. Since there is currently not a survey in place with the questions needed for the project one needed to be developed. The validity and reliability of the tool has not been proven. Therefore, the primary investigator could word the survey in order to provide favorable results, making the project appear to have been statistically significant, when it was not.

Instrument

This study utilized a pen and paper, pretest/posttest format to gather quantitative data for descriptive study of the research questions. This pretest/posttest contained

general knowledge-based multiple choice questions and case studies. The instrument included a pretest with 26 questions (Appendix A: Provider Childhood Obesity Survey; pretest, posttest, and follow-up), along with a posttest with the same fourteen questions on the topic of current evidenced-based practice guidelines. The posttest consisted of the same questions on the pretest with the exception of the first three demographic questions and the eight current practice questions. An email address was placed on the posttest in order to distribute follow-up survey. A follow-up survey was emailed to participants using the same eight questions on the pretest to determine if self-reported perceived practice changes occurred. Since an instrument specific to the research questions could not be found, a survey tool was developed. The new instrument incorporated a review of current literature and information from the ICSI current evidenced-based practice guidelines. The first three questions on the pretest included demographic data. The following eight questions related to current provider practice. The final fourteen questions were based on current evidenced-based practice guidelines and included two case studies. Close ended questions were utilized for the testing. The pretest was comprised of four major sections: (a) demographics; (b) current provider practice; (c) current evidenced-based practice guidelines; and (d) case studies. The posttest followed the same format with three major sections; (a) current practice guidelines; (b) case studies; (c) current email address to send follow-up survey. The six week follow-up survey consisted of the same eight questions regarding providers' current practice that were on the pretest.

Content Validity

Content validity of the study tool, to the degree to which the instrument accurately reflects providers' knowledge and accuracy based on current evidenced-based practice guidelines for obese and overweight children, was established by an evaluation of the survey content. A review of literature was performed with 37 studies validating the need for education. The studies indicated the areas in which providers had the most difficulty correctly identifying and adhering to the current guidelines. The survey tool was developed based on the areas where providers required the most education, including accurate diagnosis, appropriate laboratory testing, recognizing the components of the 5210 program, and comorbidity assessment. Evaluation of the survey content was performed by three providers whom deliver care to children in a primary care setting. The providers each reviewed the pretest and scored it according to its relevance, clarity, organization, and completeness to the topic of understanding current evidenced-based clinical practice guidelines on childhood obesity. The scoring index was measured on a 1-4 scale with 1=not relevant, 2=somewhat relevant, 3=quite relevant and 4=very relevant. The total relevance scores were 54/56, 54/56 and 48/56. Each scorer offered comments which differed from the others. No two experts came to the same conclusions with their scoring. Provider one suggested open ended questions or a comment section which would allow for spontaneous answers. Provider two commented on how the case studies may be confusing due to the age of the children and the way the scenario was worded. Expert three commented that some of the questions were lengthy and should be shortened. The comments were all taken into consideration and changes were made to the survey to increase understanding and readability of the questions. Once the questions were

approved by all committee members, the primary investigator had three nurse practitioner students take the finished test. The nurse practitioner students that were chosen to take the test were not able to be present at the conference. The pretest was the lengthiest of the questionnaires and therefore, was given to assess for clarity and to detect if survey fatigue was a concern. The pretest took the nurse practitioner students between 10-15 minutes to complete. All students felt the test was clear and easy to comprehend. Survey fatigue and comprehension was not found to be a concern.

Operational Definitions

Operational variables describe what is observed or measured. They are written in quantitative values. The following are defined as operational definitions for the purpose of this study.

1. BMI- calculated by dividing weight in kilograms by the square of height in meters.
2. Obesity- a BMI in the 95th percentile or higher for age and gender.
3. Overweight- a BMI in the 85th to 94th percentiles for age and gender.
4. Knowledge- information obtained from the pretest and posttest scores.
5. Accuracy- freedom from mistake or error, conformity to truth or to a standard or model (Merriam-Webster Dictionary, n.d).
6. Perceived- to attain awareness or understanding of, to regard as being such (Merriam-Webster Dictionary, n.d).

BMI tools and calculators are easy to use and readily assessable. They are endorsed by all evidenced-based clinical practice guidelines. The BMI tool was developed by Adolphe Quetelet from 1830 to 1850 calling it “social physics” (Eknoyan, G. 2008).

Ancel Keys did not modernize the term "body mass index" until 1972 in a paper to the Journal of Chronic Diseases (Eknoyan, G. 2008). BMI is used differently for children. It is calculated in the same way as for adults but then compared to typical values for other children of the same age to get a percentage. It is compared against the percentile for children of the same gender and age instead of fixed numbers as in adults (Eknoyan, G. 2008). Trending weight using percentiles allows for a more accurate representation of growth and allows for it to be followed over time.

Procedure

The project comprised of an educational presentation over current evidenced-based clinical practice guidelines related to childhood obesity followed by a six week follow-up survey. The participants were present for the annual 4-State APN conference March 5th and 6th. Once participants arrived at the location they were seated and a packet containing the pretest and posttest were distributed. They were instructed to not open the packet until the project was explained and questions answered. The packet included a pretest which assessed current provider practice, current evidenced-based clinical practice guidelines on childhood obesity, the participants' email address, and demographics for characterization, and to confirm inclusion. The posttest had the same evidenced-based clinical practice guideline questions. The current provider practice questions were distributed via email six weeks after the education to assess whether a perceived provider practice change occurred. Once participants were seated, the purpose of the study was explained with the opportunity for questions before the beginning of the education and the opportunity to dismiss themselves if desired. Participants at the conference received continuing education credit, regardless of inclusion into the study. Therefore, completion

of the pretest/posttest was not required to receive credit, which was explained to the group. The pretest and demographic sheet was completed and placed in a lockbox prior to the beginning of the power point presentation. The educational program lasted approximately 40 minutes. Once the power point presentation was complete, the posttest was removed from the packet and completed. Once completed the test were collected and placed in the lockbox with the pretest. After all tests were picked up and placed in the lock box, a question and answer period followed. The surveys were sorted and matched using the code by the primary investigator with all data placed in an Excel worksheet. Six weeks following the educational program, the practice change questions were emailed to the participants who qualified. Once the surveys were returned the data was entered into an Excel spreadsheet by the primary investigator. All data were reviewed and found to be accurate.

Data Collection

Demographic data was collected from three questions on the pretest to describe characteristics and ensure inclusion of the group. The data was collected by the primary investigator and secured in a locked box. The data was kept in a locked box available only by the primary investigator. The results of the study will be available to participants and the public in chapter IV of the project without identifying information. The data will be shredded at the end of the project and completion of the program.

Statistical analysis was performed using an Excel worksheet to tabulate the data collected. In order to be statistically significant a probability level that was accepted is $p < 0.05$. A *t*-test was conducted separately on the pretest and posttest results. A comparison

was performed with pre-education scoring and post education scoring six weeks later to assess whether a self-reported perceived practice change occurred.

Outcome Data

Outcome data was collected and calculated based on the pretest and posttest answers. Outcome data was based on the following research questions:

1. Will education increase the accuracy of providers when identifying diagnostic criteria based on current practice guidelines for childhood obesity/overweight?
2. Will education increase the accuracy of providers when selecting appropriate lab testing for children based on current practice guidelines for childhood obesity/overweight?
3. Will education increase the providers' knowledge of the 5210 program components?
4. Will education increase the accuracy of providers when identifying comorbidities associated with obesity/overweight?
5. Will providers have a self-reported increase in diagnosis of overweight and obesity six weeks post education?
6. Will providers have a self-reported increase in ordering recommended laboratory testing for children that are overweight/obese six weeks post education?
7. Will providers have a self-reported increase in assessment of comorbidities for overweight/obese children six weeks post education?

Outcomes

Evaluation Measures Linked to Objectives

Evaluation measures are linked to the objectives by the logic model (Figure 2). This study included an educational program with a pretest and posttest which measured participants' knowledge of diagnostic criteria and current evidenced-based clinical practice guidelines for treating childhood obesity. The project then assessed the providers perceived practice change six weeks after the education with a follow-up survey. The outcomes that were evaluated included: accuracy with use of diagnostic criteria, knowledge of current clinical practice guidelines, 5210 components, appropriate laboratory test, assessment of comorbidities, and self-reported increase in use of the guidelines resulting in a perceived practice change. A positive outcome evaluation will be indicated by an increase in correct answers after the educational program is complete and an increase in the provider perceived use of the guidelines six weeks after the education. Increased self-efficacy, use of the guidelines and improved assessment, and treatment are all linked to increased understanding of the current evidenced-based clinical practice guidelines. Initiating a practice change for providers is the most important medium-term outcome and a desired result of the project. The long term outcomes that will someday be accomplished are beyond the scope of this project. They will likely take years to come to culmination and evaluation should only be done at that time.

Pretest and posttest design measures outcomes among program participants before and after the intervention. This design is relatively easy to implement. The posttest was given directly following the education; therefore, decreasing the risk of the participants getting influenced by other programs or information. Six weeks following the

education a follow-up survey was emailed to participants. Answers were compared and tabulated to assess whether a perceived practice change occurred.

Instrument linked to Measures and Objectives

The measurement tool was designed with a pretest and posttest format to gather quantitative data based on the results of the research questions. Following the initial testing, a six week follow-up questionnaire was emailed to assess whether a perceived practice change occurred with providers. The instrument included a pretest with 26 questions and a posttest consisting of the same questions as the pretest with the exception of the demographic information and current provider practice questions. Since an instrument specific to the research questions could not be found, a survey tool was developed. The survey tool was based on current evidenced-based standards and clinical practice guidelines. A total score was utilized for the results. It was tested for content validity by three practicing nurse practitioners and again by three nurse practitioner students for survey fatigue and comprehension. The test has a variety of questions including multiple choice and two separate case studies. Spontaneous responses were not allowed in the survey. The test questions will ascertain whether the education provided the participants with useful information regarding current evidenced-based clinical practice guidelines on childhood obesity and if a perceived practice change occurred six weeks after the education. The following (Table 2) represents what questions were evaluated and the intended outcomes of the program and testing.

Table 2:

Objectives, Measurements and Outcomes

Objective	Measurement	Outcome	Analysis
Participants will correctly identify indicators of obesity/overweight and provide the correct diagnosis.	Participants will have an increase in correct responses regarding accurately utilizing diagnostic criteria for obesity and overweight based on BMI.	Participants will choose the correct diagnostic criteria for overweight/obesity based on guidelines.	*t*-test pretest/posttest format.
Participants will correctly identify the appropriate laboratory testing for children with obesity and overweight.	Participants will have an increase in correct answers to questions regarding accurately identifying appropriate lab testing for children with obesity and overweight.	Participants will appropriately identify the correct lab test to order and when based on case studies and multiple choice.	*t*-test pretest/posttest format.
Participants will correctly identify the components of the 5210 program.	Participants will have an increase in correct responses to questions regarding the separate components of the 5210 program.	Participants will recognize the different components of the 5210 program.	*t*-test pretest/posttest format.
Participants will identify common comorbidities associated with obesity/overweight.	Participants will have an increase in correct responses to questions regarding the recognition of	Participants will learn the most common comorbidities associated with childhood obesity.	*t*-test pretest/posttest format.

	comorbidities associated with obesity and overweight.		
Participants will have a self-reported increase in diagnosis of overweight and obesity six weeks post education.	Participants will have an increase in percentages to questions regarding the use of correct diagnosis from pre-education compared to six weeks post education.	Participants will report a perceived increase in diagnosis associated with childhood obesity/overweight	Comparative
Participants will have a self-reported increase in ordering recommended laboratory testing for children that are overweight/obese six weeks post education.	Participants will have an increase in percentages to questions regarding ordering recommended laboratory testing from pre-education compared to six weeks post education.	Participants will report a perceived increase in ordering recommended lab test associated with childhood obesity/overweight.	Comparative
Participants will have a self-reported increase in assessment of comorbidities for overweight/obese children six weeks post education.	Participants will have an increase in percentages to questions regarding comorbidity assessment from pre-education compared to six weeks post education.	Participants will report a perceived increase with the assessment of comorbidities associated with childhood obesity/overweight	Comparative

Methods of Analysis for Measurement

Statistical analysis was performed using an Excel worksheet to tabulate the data collected. In order to be statistically significant, the probability level that was accepted is $p < 0.05$. That signifies less than a 0.05% probability that the result occurred due to chance and not by the education provided. It will indicate with 95% certainty that the observed results occurred as being a result of the education. A *t*-test was conducted on the survey comparing the results of the pretest and posttest scores after the education.

Questions were scored as one point each. The analysis was performed to measure the results of the pretest scores and the posttest scores after the education was complete to assess if knowledge was gained and accuracy improved based on current evidenced-based clinical practice guidelines. Comparative analysis was performed on the six week follow-up questions to assess changes in the aforementioned outcome variables. The analysis was performed using a Likert scale and tabulating the data.

Sustainability

There is no standard for defining sustainability. According to some definitions it is a continuity of a program or service (The Office of Adolescent Health, March 2014). Others define it as the continuation of activities and impacts that create a legacy (The Office of Adolescent Health, March 2014). The most effective interventions in preventing childhood obesity utilize many avenues. Key components to the success and sustainability include building on existing frameworks, recommendations, policies and datasets, developing community ownership, and influencing social norms (World Health Organization, 2012). Implementation and sustainability can be improved with planning and budgeting (World Health Organization, 2012). Strategies to initiate creativity in

funding can include private sector help and targeted taxes to help sustain health promoting interventions (World Health Organization, 2012). Other options to explore for funding include grants and local and community foundations. Maintaining clinical gains instead of reverting to old practices is an important factor in sustainability (Rankin, Chlebowy, Vorderstrasse, & Blood-Siegfried, 2015).

In order to achieve a sustainable impact a planning process is required. Planning for sustainability is a continuous process with many activities occurring concurrently (The Office of Adolescent Health, March 2014). Sustainability planning should focus on responding to the community needs (The Office of Adolescent Health, March 2014). The Office of Adolescent Health (OAH) has a framework that is practical and provides a foundation for sustainability planning. It is available on the website with multiple planning tools to facilitate the planning stages. The framework provides flexibility and emphasizes the continuation of activities and impacts (The Office of Adolescent Health, March 2014). Careful planning, monitoring of programs and services, development of a plan and reviewing it often are key to achieving sustainability (The Office of Adolescent Health, March 2014).

Summary

The incidence of childhood obesity indicates the need for providers to follow current evidenced-based clinical practice guidelines and provide appropriate care. The need exists for an educational program with current evidenced-based clinical practice guidelines and tools to assist providers in accurately following recommendations. As studies suggest, if a provider is aware of the guidelines, they are more likely to use them (Harkins et al., 2012). Use of the guidelines has been proven to decrease childhood

obesity (Rausch, Perito, & Hametz, 2011). Without a diagnosis of obesity, providers are less likely to treat and provide appropriate interventions (Savinon et al., 2012). This project included an educational program to participants with a pretest to evaluate current knowledge in childhood obesity guidelines. The posttest evaluated knowledge gained from the educational program. A follow-up survey was distributed via email six weeks after the education to assess whether a perceived self-reported practice change occurred with providers. Chapter IV discusses the results of the study.

Chapter IV

Introduction

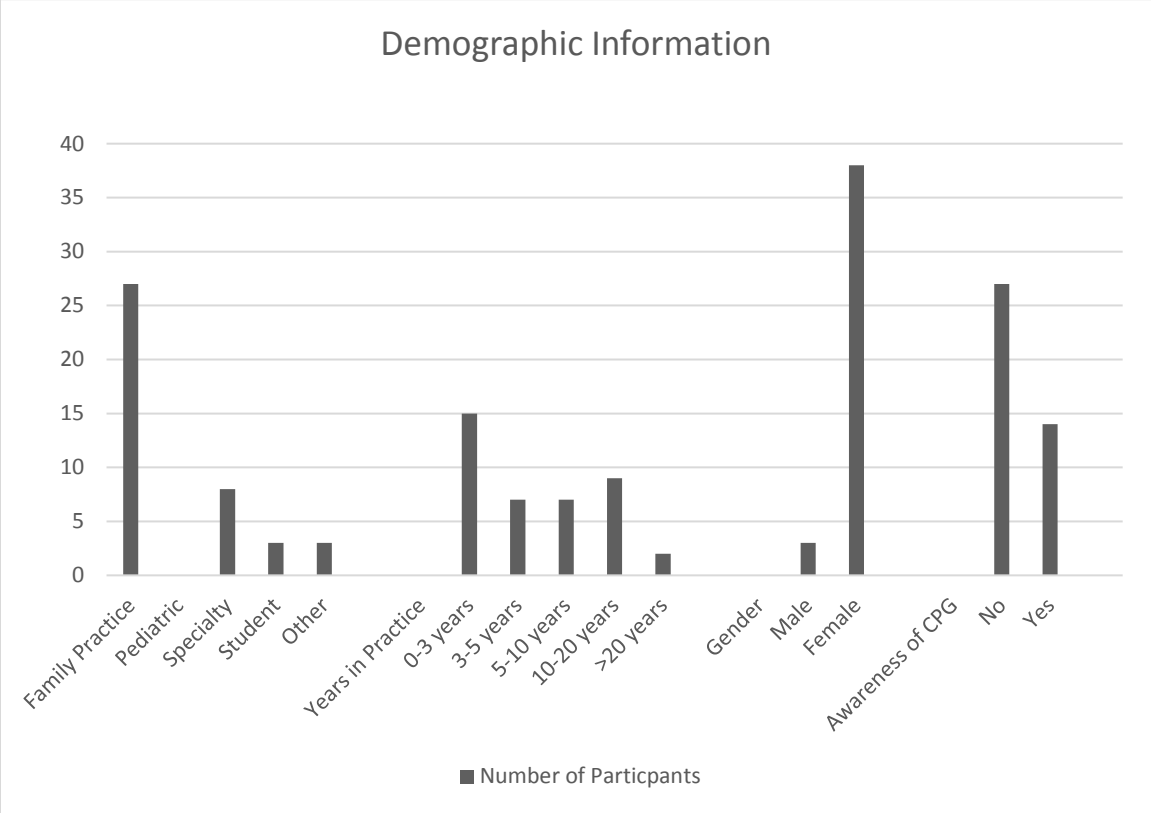
The data in this study was collected to determine whether an increase in knowledge and accuracy would occur when providers were given education on the current evidenced-based clinical practice guidelines on childhood obesity and overweight and if providers would initiate a practice change six weeks post education. The sample included 41 participants at a local nurse practitioner conference. The first data set included information on the educational presentation and if knowledge was gained; the second data set was used to gauge if a perceived practice change occurred six weeks after the education. The participants were given a pretest with demographic information, current evidenced-based clinical practice questions, and current childhood obesity guideline questions. After the education was provided a posttest was given with the same 14 childhood obesity guideline questions as the pretest with a possible cumulative score of 14. The pretest contained a total of 27 questions and included three demographic questions, one question regarding awareness of the current guidelines, eight questions regarding the providers current practice and 14 guideline questions based on the education provided on specific indicators of childhood overweight and obesity.

Demographic Data

The demographic data collected from the participants included practice setting, years of experience and gender (Table 3). Sixty-six percent of participants (n=27) care for children in the family practice setting. Specialty providers (n=8) accounted for 20% of the participants, while the remaining 14% were classified as other (n=3) or students (n=3). Thirty-seven percent of providers (n=15) have been in practice for 0-3 years, followed by 17% (n=7) for 3-5 years, 17% (n=7) for 5-10 years, 22% (n=9) for 10-20 years, with the remaining 5% (n=2) being in practice for over 20 years. Female participants were dominant in the sample group with 93% (n=38) in that category. The majority of the respondents (66%) were not aware of the current clinical practice guidelines on childhood obesity prior to the education provided.

Table 3:

Demographic Information



Pretest, Posttest and Follow-Up

All participants were given a pretest immediately prior to the education and a posttest following. The tests were grouped according to the number code in the upper right hand corner. Both tests contained the same 14 childhood obesity guideline questions and were worth 14 total points. The first 10 questions were multiple choice and focused on diagnosis, assessment of comorbidities, correct laboratory testing, and the 5210 program components. Two case studies were presented with two questions each to evaluate not only knowledge of what was presented but the assimilation of that knowledge. The pretest contained eight current evidence-based clinical practice guideline questions that were multiple choice. The current practice questions were based on self-

reported diagnosis, ordering of laboratory tests, and assessment of comorbidities in overweight and obese children between the ages of 2 and 17. The participants were asked to estimate the current number of times they diagnosed and assessed comorbidities and what test they ordered based on their current practice. Those same eight questions were then distributed via email to the participants that answered those questions six weeks after the education. Six questions on the follow-up survey were evaluated on a Likert Scale of 1-5; the higher value indicates an increase with the intervention frequency. Two of the questions were scored only as correct or incorrect since more than one answer could apply. Students or those not currently practicing or seeing children were not able to participate in part two of the study. The pretest also included a space for the participants' email address in order to be included in the six week follow-up study.

Results of the Study

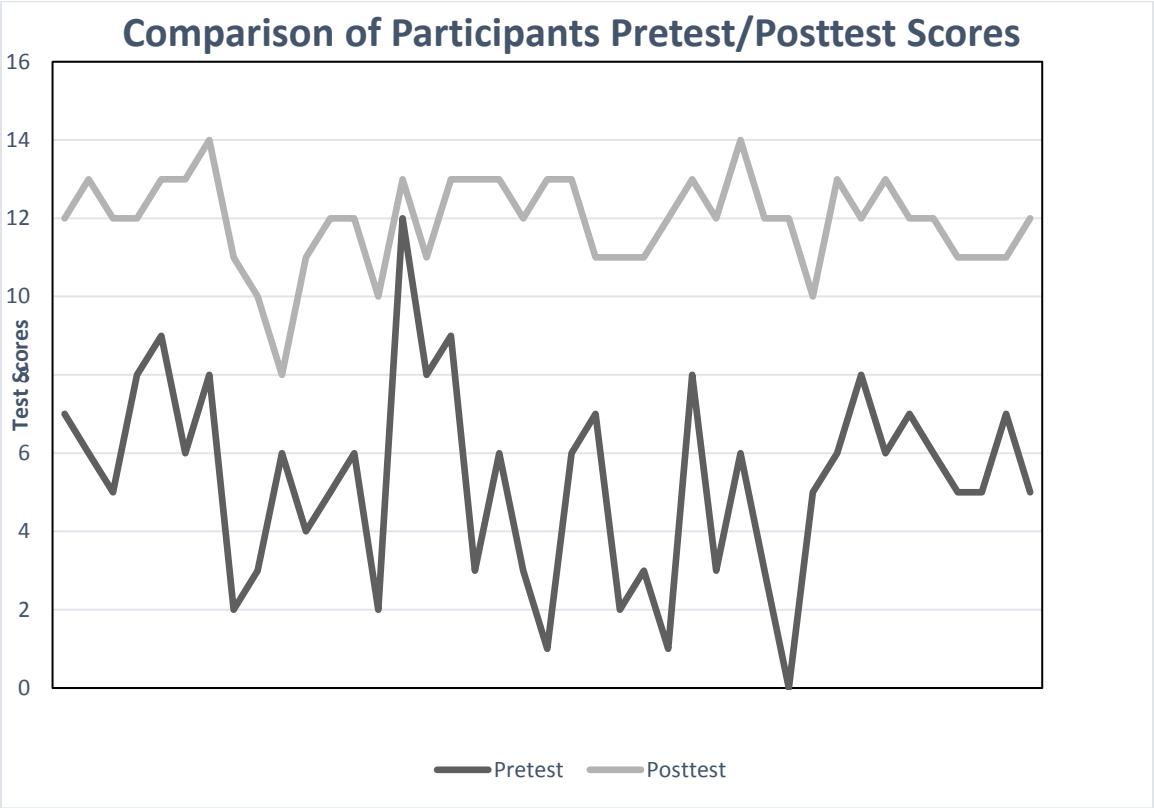
Part One

The study concluded with statistical significance ($p<0.05$) that the education provided increased the knowledge of the providers with current evidenced-based clinical practice guidelines on childhood obesity. The posttest scores were improved after the education was provided. The pretest scores ranged from 0-12 correct answers, with one participant not answering any question correctly and one participant with the most correct of 12. The majority of scores fell in between. The mean pretest score was 6 with a standard deviation of 2.5341 in the pretest group (n=41). The posttest scores ranged from 8-14 correct answers. One participant scored 100% on the posttest out of 41 respondents. The mean posttest score was 12 with a standard deviation of 0.376 in the posttest group (n=41). The differences in pretest and posttest scores had a median of 7 with a standard

deviation of 0.779 between the group (n=41). All respondents (n=41) had an increase in posttest scores after the education was provided (Table 4).

Table 4:

Comparison of Participants Pretest/Posttest Scores



A *t*-test was performed with the results presented below (Table 5).

Table 5:

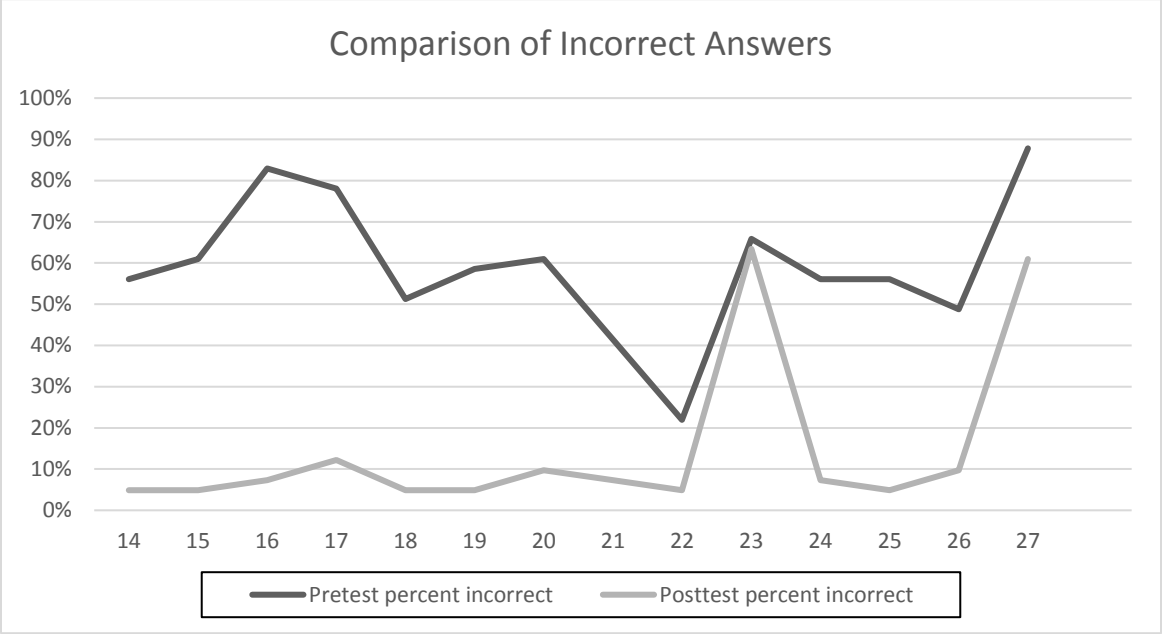
t-test results

	Variable 1	*Variable 2*
Mean	5.317073171	11.92682927
Variance	6.42195122	1.419512195
Observations	41	41
Pearson Correlation	0.2894005	
Hypothesized Mean Difference	0	
Df	40	
t Stat	-17.1446891	
P(T<=t) one-tail	2.46204E-20	
t Critical one-tail	1.683851013	
P(T<=t) two-tail	4.92409E-20	
t Critical two-tail	2.02107539	

Analyzing individual questions that were most often answered incorrectly is important to determine content areas that may need reinforced through further education. The most frequently missed questions on the pretest were numbers 16, 17 and 27. The percentage of incorrect answers on the pretest and posttest are compared and represented in (Table 6).

Table 6:

Comparison of Incorrect Answers



Eighty-eight percent (n=36) of participants incorrectly answered case study question number two (#27) based on current evidenced-based clinical practice guidelines and assimilation of that information. The majority of participants believed the next best action to take with a six-year-old female in the 89th percentile for weight was to draw a lipid panel, AST, ALT, and FBS. The correct answer according to the recommended laboratory guidelines indicates only a lipid panel be drawn. Although the score increased on the posttest with 61% (n=25) of participants answering correctly, it remained the most frequently missed question on both tests. Question 16 on the pretest asked, "At what age lipid panels should be ordered for children with a BMI over 95 percent?" Eighty-three percent of the participants (n=34) answered incorrectly, choosing over the age of 10 as correct rather than over the age of two. Improvement occurred on the posttest with 7% (n= 3) answering incorrectly. Question 17 was answered incorrectly 78% (n=33) of the

time on the pretest. The question asked what laboratory testing should be ordered on overweight/obese children. The answers that were most often selected included a variety of the following: TSH, hemoglobin A1C, and lipid panel. The correct response to the question is a lipid panel. An improvement in scores occurred after the education with 12% (n=5) of the participants answering incorrectly. One question on the pretest had a negligible improvement in scores. Question 23 asked at what age lipid panels are drawn for children over the 85th percentile for weight. On the pretest 66% (n=27) answered the question incorrectly. On the posttest 63% (n=26) of participants answered the question incorrectly. One possible causative factor included the wording of the question with participants believing more than one answer to be correct. A second possible factor was confusion with the percentiles and participants not understanding the BMI listed was for a child in the overweight category rather than obese. The most commonly missed questions on the pretest/posttest were based on laboratory indications for children. This study indicates that many providers in family practice do not routinely order labs on children or have knowledge of the current evidenced-based clinical practice guidelines for children who are obese or overweight.

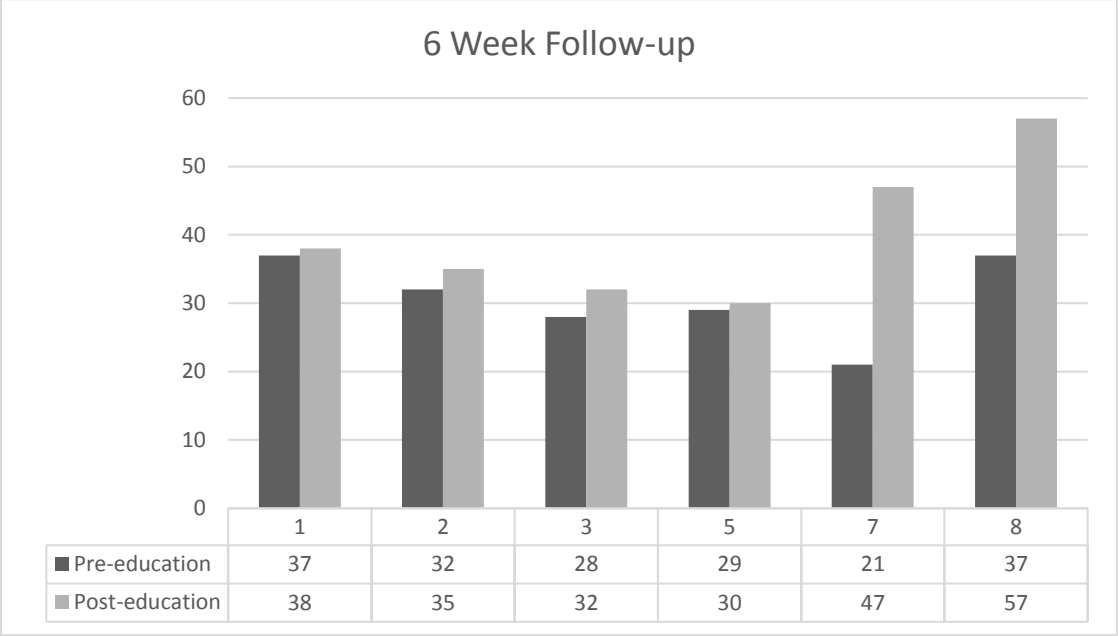
Pretest scores on 5210 components ranged from 39-49% correct. Improved scores were noted in all participants with the 5210 guidelines and usage. Improvement in posttest scores ranged from 90-95% of participants with correct answers regarding 5210 guidelines.

Part Two

Twenty-one participants qualified for the follow-up survey. The eight questions that were included on the pretest to assess the provider's current practice with childhood obesity were emailed to the addresses provided. Twelve surveys were returned which led to a return rate of 60%. Out of the surveys not returned, two had email addresses that were not active and one respondent stated that they do not see children in practice any longer. The results indicate improvement in several key areas (Table 7). The most impressive improvements in the group of providers and perceived practice change was an increase in the assessment of comorbidities and education using the 5210 program components. A 65% increase occurred with assessment of comorbidities. On average providers assessed co-morbidities only monthly prior to the education. Post education comorbidities were assessed 3-6 times a week by most respondents with three respondents performing the assessment daily. A 45% increase occurred with providers educating patients on the 5210 components. Frequency of the education increased from monthly to 3-6 times a week on average. While the values did not increase significantly with diagnosing and ordering of laboratory testing, they did not decrease. Questions four and six asked providers what laboratory testing they ordered for obese and overweight children. During the pre-education evaluation, no providers replied with the correct answer on either question. Four providers (33%) answered correctly on question four, when asked what lab test they order in current practice for overweight children post education. Question six was answered correctly 25% of the time with three providers choosing the correct laboratory testing for obese children.

Table 7:

Six Week Follow-up



Even though statistical significance cannot be reported on this data, it is useful for future practice and research. Value can be taken from the results, even with a small return rate. All participants in the six week follow-up study had an increase in the use of the 5210 components and assessment of comorbidities. The foundation that providers build upon to combat childhood obesity is based on those principles.

Summary

Chapter four discussed the statistical analysis of the two-part study. A positive outcome evaluation was indicated by an increase in correct answers to specific indicators of childhood obesity after the educational program was completed and an increase in the provider perceived use of the current clinical practice guidelines six weeks post education. Increased self-efficacy, use of the guidelines and improved assessment, and treatment are all linked to increased understanding of the current evidenced-based clinical

practice guidelines. The data gathered revealed an increase in posttest scores, achieving statistical significance at $p<0.00001$. The findings of the study support that many providers are not aware of the current evidenced-based clinical practice guidelines in childhood obesity. Although information is readily available through websites, guidelines, research, and practice settings, providers must continuously update their knowledge to improve care for overweight and obese children. The findings of this study are not surprising and validate the need for continued educational programs for providers in childhood obesity.

Chapter V

Introduction

The study included an educational program to providers and nurse practitioner students in order to evaluate whether an increase in knowledge and accuracy occurred based on evidenced based answers to specific indicators of childhood obesity. It assessed the providers' knowledge and sought to evaluate if increased knowledge occurred after an educational program presentation. Following the educational program, a follow-up survey was distributed via email to assess the providers perceived practice change six weeks after the education.

Relationships of Outcomes to Research

Increased Accuracy Identifying Diagnostic Criteria

During this project prior to the educational presentation, the providers were accurate in diagnosing overweight 39% of the time and obesity 44% of the time based on the pretest. After the education was provided improved accuracy was noted with both diagnostic criteria. Overweight was accurately diagnosed 95% of the time and obesity 95%. This indicated that the study participants were diagnosing overweight and obesity at a higher than average percentage compared to providers in other research studies prior to receiving education.

Previous studies found that although 19.5% of children have a BMI meeting diagnostic criteria of overweight or obesity, only 7% had a diagnosis of overweight or obesity (Walsh et al., 2013). When the patient met the diagnostic criteria for obesity, only 15.2% had a positive response to questions such as "Does the patient now have obesity?" Spivack et al. (2010) performed a study where 26% of providers correctly identified the definition of childhood overweight or obesity, but only 9% had a correct diagnosis. Hurt, Pinto, Watson, Grant and Gielner (2014) performed a study that revealed providers diagnosed overweight 0.9% of the time, while obesity was diagnosed 22% of the time.

Self-Reported Increase in Diagnosis of Overweight and Obesity

Six weeks following the education providers self-reported the same rate of diagnosis for overweight and obesity as they did prior to the education. In this study an increase in diagnosis of overweight and obesity did not occur following the education as previous studies found. Few studies used self-reported data; therefore, it was difficult to compare these results to prior study results. Self-reporting can be misleading with the providers underestimating the numbers of diagnosis and may contribute to low numbers.

Rubin (2011) reported that one-fourth of providers describe themselves as either not at all or only slightly competent in managing childhood obesity. In addition, only 2.9% of providers felt effective in their management of childhood obesity (Rubin, 2011). A strong desire to address childhood obesity was cited by providers; unfortunately, a low confidence level with effectiveness was also indicated (Haemer et al., 2011). Haemer et al. (2011) stated that primary care providers are hesitant to screen and diagnose obesity because of their lack of confidence in providing care for the children. The hesitancy to diagnose was found in multiple studies, with rates ranging from 18%-54% (Nader et al.,

2014; Walsh et al., 2013; Haemer et al., 2011). Education and training proved to be a successful intervention in a study by Haemer et al. (2011) in changing primary care practices with diagnosis and comfort level. In another study by Savinon et al. (2012) providers' practice in assessment and management of childhood overweight and obesity improved at three and six months after education was provided.

Increase Accuracy Selecting Appropriate Lab Testing

During the pre-education in this study, 22% of participants correctly identified the appropriate laboratory testing to be ordered. This study is consistent with previous research and studies indicating a low level of accuracy ordering appropriate testing. Accurate selection of lab testing for overweight and obese children increased following the education with improvement with accuracy in 88% of providers. Increased education for providers regarding the correct laboratory test to order for overweight and obese children is needed as indicated by this study and previous research.

Nader et al. (2014) performed a study finding only one-third of eligible children in 2009 received the recommended screening for diabetes, nonalcoholic fatty liver disease, and lipid disorders by accurate selection of evidenced-based practice guidelines for lab testing. Recommendations by the Expert Committee state all children and adolescents with a BMI at or above the 85^{th} percentile (overweight) receive lab testing beginning at age ten and those over the 95^{th} percentile (obese) begin at age two. In one study only 29.9% of children in the overweight category and 40% in the obese category were tested appropriately with laboratory screening (Hurt et al., 2014).

Self-Reported Increase in Ordering Recommended Laboratory Testing

In the current study, a negligible increase was noted with providers ordering laboratory testing six weeks post education. On the six week follow-up survey, the fourth and sixth questions asked providers what laboratory testing they ordered for obese and overweight children. During the pre-education evaluation, no providers replied with the correct evidenced-based answer on either question. Six weeks following the education four providers (33%) answered correctly on question four when asked what laboratory test they ordered in current practice for overweight children. Question six was answered correctly 25% of the time with three providers choosing the correct evidenced-based recommendations of laboratory testing for obese children. Despite recommendations for laboratory screening of children and adolescents with a BMI at or above the 85th percentile, the rates of screening were below what is recommended by the Expert Committee Panel and AAP in this study.

Increase Knowledge of the 5210 Program

Consistencies were found between this study group and other research studies on the numbers of participants that were aware of specific components of the 5210 program prior to education. Prior to the education 39-49% of respondents correctly identified components of the program. Post education that number was increased to 90-95% of respondents indicating that education improved scores in all participants with the 5210 components. In the six week follow-up study an increase occurred with 45% of providers reporting they are educating patients on the 5210 components. Frequency of the education increased from monthly to three to six times a week on average with providers in that group.

Specific studies based on knowledge and use of the 5210 guidelines were not found, only studies that contained the separate components of the program. According to Shreve (2015) only 15% of children have documented sedentary behaviors and physical activity. In a study of 87 providers, 44% of the respondents correctly identified the AAP recommendation of zero sugary drinks and 39% knew the AAP recommendations for a minimum of one hour of physical activity each day (Spivack et al., 2010).

Increase Accuracy Identifying Comorbidities

Prior to education 44% of participants answered correctly when asked what was a comorbidity associated with overweight/obesity. Acanthosis Nigerians was commonly assessed 59% of the time. Those percentages are lower than other research studies. During the six week follow-up, providers in this study had an increase in self-reported assessment of comorbidities. Providers began assessing comorbidities at visits 65% more frequently than prior to the education. On average providers assessed comorbidities only monthly prior to the education. Post education comorbidities were assessed three to six times a week by most respondents with three respondents performing the assessment daily during the six week follow-up survey.

Current clinical practice guideline recommendations include assessment for a family history of obesity and related complications. A study by Hurt et al. (2014) found that only 1.5% of obese children had documentation of taking a family history for diabetes. A similar number was found when screening for a family history of lipid disorders (Hurt et al., 2014). The recommendation of the Expert Committee and the ISCI is to evaluate children with a BMI in at least the 85th percentile for associated comorbidities and complications such as diabetes, dyslipidemia, and hypertension.

Additionally, the recommendations include providers obtaining a focused family history of obesity, type 2 diabetes mellitus (DM), and cardiovascular disease (CVD) in first- and second-degree relatives to assess the risk of current and future comorbidities associated with the patient's weight status (Institute for Clinical Systems Improvement, 2013). Participants in a 2011 study by Rausch et al. admitted to "always" or "sometimes" asking patients or families about history or complications of obesity. Questions related to diabetes were asked 84% of the time, cardiovascular disease 86% of the time and early deaths from heart disease 68% of the time. Symptoms of obesity were investigated less than half the time by providers including depression and anxiety, snoring, daytime sleepiness, headaches, hirsutism, hepatomegaly, and hip/knee pain. Acanthosis Nigerians was most commonly assessed with a reported frequency of 84%.

Observations

Many observations can be made based on comparisons of the pretest, posttest and six week follow-up data. Even more importantly information can be compared to previous research and studies. While many of the studies were done on a larger scale, similarities can be found within this smaller study. This research indicated that the majority of the respondents (66%) were not aware of the current evidenced-based clinical practice guidelines in childhood obesity prior to the education provided. Awareness of the current guidelines were reported by 70% of physicians in one study (Harkins et al., 2012). Providers in this study are diagnosing overweight and obesity prior to education at a higher rate than other studies researched. Screening for comorbidities was lower with 59% screening for signs of diabetes (Acanthosis Nigerians) compared to 84% in other studies. Rates of recommendations for exercise amounts and ordering laboratory testing

accurately were consistent with previous studies. Providers in this study did not meet expectations in the area of increased use of diagnosis six weeks following the education. Other studies were able to document an improvement in the providers' diagnoses post education, while this smaller study was not able to document an improvement.

Evaluation of Conceptual Framework

Education utilizing the Chronic Care Model (CCM) had positive influences and an increase in knowledge regarding diagnosis and treatment of obesity in children with study respondents. Using the CCM as a basis for the research provided a framework for integration of clinical practice guidelines and education using evidenced-based practice. In order to follow the CCM the researcher and providers included self-management support, delivery system redesign, decision support, and computer information systems. Self-management support for patients and family included education utilizing the 5210 guidelines. Providers were educated on the components of the 5210 guidelines at the educational conference. Decision support utilized evidence-based guidelines with current practice guidelines from the International Clinical Systems Improvement (ICSI) for the basis of the education. Delivery-system redesign included education to providers with time management suggestions to promote better care, accuracy, and follow-up of identified patients that was provided during the educational conference. Clinical information systems using Excel tabulated data and evaluated if the provider had increased adherence to the guidelines along with increased knowledge and accuracy. The integration of both circles of care within the Chronic Care Model provided productive collaboration between the researcher and participants and the providers and patients.

Knowledge of the clinical practice guidelines and improved accuracy was achieved with the use of the CCM to guide the educational project.

Evaluation of Logic Model

This study measured participants' knowledge of diagnostic criteria and clinical practice guidelines in childhood obesity before and after an educational program. The project then assessed the providers perceived practice change six weeks post education with a follow-up survey. Evaluation measures were linked to the objectives using the logic model. The evaluated outcomes included: accurately initiating a diagnosis using specific indicators of childhood overweight/obesity, knowledge of current evidenced-based clinical practice guidelines, 5210 components, correct laboratory test, assessment of comorbidities, and self-reported increase in use of the guidelines resulting in a perceived practice change.

Positive outcomes were identified by an increase in evidence-based responses after the educational program and an increase in the provider perceived use of the guidelines six weeks post education. As indicated by the pretest and posttest scores the education provided valuable information increasing the providers' knowledge. That knowledge was maintained at six weeks post education, in all but one area: diagnosis. The project supported the logic model in both short term and medium term outcomes. Providers utilized the guidelines once given the education. Increased use of the 5210 guidelines and assessment of comorbidities six weeks post education validated the logic model.

Study Limitations

One limitation of the study is the primary investigator correlated the six week post education results with a self-reported survey and not actual chart audits. The respondent rate was low for the follow-up survey with only 12 returned surveys. The respondents were only estimating the number of times they provided the treatment prior to the education compared to after the education. That could lead to an unintentional misrepresentation of current practices. The follow-up survey was emailed at six weeks post education. It would have been beneficial to have multiple points in time as comparison, such as with a three-month follow-up, six-month follow-up and a one-year follow-up to see if the guidelines continued to be a part of the providers practice. Another limitation of the survey is based on the survey questions since the survey tool was a new researcher developed, non-validated survey. All efforts were made to ensure content validity of the survey prior to the education; however, it limited the ability to compare the response results with other survey data.

Implications for Future Research

Limitations of this study can be addressed with future research in the areas of self-reporting results post education and additional post education evaluations at specified intervals (such as 3, 6, 9 and 12 month intervals). While the literature review revealed multiple studies performed prior to education and immediately post education, few were found that included longer spans of time. Surveying participants further out from the educational date in order to evaluate whether the current evidenced-based clinical practice guidelines become a part of daily practice or forgotten after a period of time

would provide useful data. Future research should also include using chart audits rather than self-reported answers for an accurate evaluation of providers' practice.

A better understanding among providers is needed of the guidelines for diagnosis in children who are overweight and obese. Prior to the education many participants were not able to identify the correct percentile for obese or overweight children with several stating the percentile of >85 to be normal and >95 overweight. Even after education, participants were still not able to select the evidence-based response regarding the recommendations for laboratory testing in this age group. Research conducted on the addition of these guidelines to an electronic medical record system may prove valuable to note if an increase in the frequency of accurate diagnosis and management occurs with an electronic reminder.

Beyond the scope of this study was treatment for childhood obesity. A follow-up study and educational program is needed to deliver providers with information regarding proper treatment and care once the diagnosis of obesity or overweight is established. Retrospective research studies with children that received proper prevention, evaluation and diagnosis compared to children that did not receive evidence-based recommendations could be performed to assess BMI into adulthood.

Implications for Practice, Policy and Education

"To begin with an end in mind" was a lesson from Stephen Covey and quoted in Moran, Burson, & Conrad (2014, p. 243). The end result of this project was to offer a way for providers to combat childhood obesity by increasing knowledge and initiating a practice change. Information on the importance of education to providers on childhood obesity and the potential to change current practices can be utilized by hospitals, clinics,

schools, and programs for obesity. Results of this study will provide valuable information to clinics, administration, policy makers, CME providers, and possibly educational institutions. Quality indicators need to be met in order to meet guidelines for Medicaid and Medicare reimbursement. Obesity is a quality indicator. If providers are not meeting meaningful use guidelines, then reimbursement from the Centers for Medicaid/Medicare will decrease by 2% per year per provider. This study has the potential to affect hospitals and clinics by avoiding a decrease in Medicare and Medicaid payments.

This project is approved for one CE through AANP, with the opportunity to provide dissemination through educational offerings, in person, on-line, or in journal articles. Hospital newsletters, TED talks, or yearly evaluation testing of providers are other options for dissemination. This study can be used as an educational guide for providers to enhance knowledge of current evidenced-based clinical practice guidelines and screening practice recommendations. A policy brief has the potential to reach influential legislators and increase opportunities for funding and programs aimed at decreasing childhood obesity and comorbidities. Information regarding the need for increased knowledge of childhood obesity guidelines is vital to ultimately decrease childhood obesity and the burden of the disease on children and the economy. Providing care to children with obesity is a time consuming and difficult task. Most providers are not educated on initiating and maintaining proper guidelines and evidenced-based practice in assessment and diagnosis. Once an accurate diagnosis is made, then treatment can begin.

Conclusion

The study participants were given the opportunity to learn current evidenced-based clinical practice guidelines in childhood obesity. Studies have shown that providers are not up to date with current practice guidelines or are not implementing them in practice. Lack of knowledge and education regarding the guidelines was cited as a barrier to use. The knowledge gained through this project will deliver valuable information for future educational offerings and needs. As more families seek guidance regarding obesity, provider knowledge regarding diagnosis, and evaluation is increasingly important. This study focused on providing education and knowledge to providers on childhood obesity and the perceived practice change that occurred six weeks post education. It is important to note that in order to decrease childhood obesity, a multi-disciplinary approach is needed involving a variety of healthcare professionals. Childhood obesity is an ever growing problem. As evidenced by the results in this study, more work is needed to care for these children effectively and prevent a lifetime of health problems. The comorbidities associated with childhood obesity have the potential to evolve into chronic health conditions at a younger age and can contribute to premature death. Providers must be ready with evidence validated knowledge and be prepared to use it on the children of the community to put a stop to this ever-growing health concern.

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APPENDIX

Appendix A:

Code_____

Provider Childhood Obesity Survey

Pretest

Demographics

1. Type of Practice: Family Practice Pediatric Specialty Other _____
2. Years in Practice: 0-3 years 3-5 years 5-10 years 10-20 years >20years
3. Your Gender: Male Female
4. Your email address:_____

Providers' Current Practice

5. Are you aware of current clinical practice guidelines on childhood obesity? Yes No
6. In your current practice how frequently do you use the diagnosis of overweight with children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never
7. In your current practice how frequently do you use the diagnosis of obesity with children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never
8. In your current practice how frequently do you order lab for overweight children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never
9. In your current practice what labs are ordered for overweight children age 2-17? (check all that apply)
    a. TSH
    b. Hemoglobin A1c
    c. Lipid panel
    d. Liver enzymes

10. In your current practice how frequently do you order lab for obese children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never
11. In your current practice what labs are ordered for obese children age 2-17? (check all that apply)
    a. TSH
    b. Hemoglobin A1c
    c. Lipid panel
    d. Liver enzymes

12. In your current practice how frequently do you provide education regarding the 5210 program components?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never

13. In your current practice how frequently do you assess for common comorbidities associated with overweight/obese children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never

The following questions are based on the Current Practice Guidelines

14. What Measurement triggers a diagnosis of obesity?
    a. BMI> 95th percentile/growth chart
    b. BMI>85th percentile/growth chart
    c. BMI >25
    d. BMI > 30
    e. Weight above average/age

15. What Measurement triggers a diagnosis of overweight?
    a. BMI> 95th percentile/growth chart
    b. BMI>85th percentile/growth chart
    c. BMI >25
    d. BMI > 30
    e. Weight above average/age

16. According to current practice guidelines at what age should lipid panels be ordered for children if BMI percentile is over 95%?
    a. Over the age of 2
    b. Over the age of 5
    c. Over the age of 10
    d. Over the age of 15

17. According to current practice guidelines what lab testing should be routinely ordered for children who are overweight/obese?
    a. TSH
    b. Hemoglobin A1c
    c. Lipid panel
    d. Insulin level

18. The recommended time for daily physical activity for children is
    a. 30 min
    b. 60 min
    c. based on age
    d. based on ability

19. Daily screen time should be limited to
    a. 1 hour
    b. 2 hours
    c. varies, it depends on if it is a weekday or weekend
    d. based on age

20. Which is not a component of the 5210 program?
    a. Recommendations for fruits and vegetables
    b. Recommendations for physical activity
    c. Recommendations for portion sizes
    d. Recommendations for sweetened beverages
    e. Recommendations for screen time

21. What is the most common symptom assessed in children regarding comorbidities?
    a. Papilledema
    b. Thyroid enlargement
    c. Striae
    d. Acanthosis Nigerians

22. What is not considered a comorbidity associated with childhood overweight/obesity?
    a. Nonalcoholic fatty liver disease
    b. Diabetes
    c. Sleep apnea
    d. Pancreatitis

23. Lipid panels should be done at what age if indicated by BMI percentile over the 85^{th} percentile?
    a. Age 2
    b. Age 10
    c. Depends on risk assessment
    d. It should never be based on BMI percentile

The following are **case studies**. Please read the following case study and respond to the questions based on the case.

"JR" is an 11-year-old boy who comes to the clinic for his physical before entering 6th grade. At today's visit, he is 4 feet 6 inches tall and 98 pounds. His body mass index is 24, falling in the 95th percentile. His mom thinks he's just a "growing boy" and that his weight is not a problem.

24. Would JR met the criteria for:

a. Normal weight
b. Overweight
c. Obese

You obtain JR's family history. His mother and grandmother are both obese and have been diagnosed with type 2 diabetes and hypertension. His review of systems and physical exam are unremarkable.

25. Based on the previous question and this information would you:

    a. Assess risk
    b. Draw a lipid profile, ALT, AST and FBS
    c. Do nothing.

"SR" is a 6 year old female that comes to the clinic with a sore throat. You notice on her chart that her BMI is 18 and she is in the 89th percentile at 53 lbs. She is 3 feet 10 inches tall. She does not mention her weight to you, but you overhear her tell her mom that she wishes she could keep up with the other kids at school.

26. Would "SR" met criteria for:

    a. Normal weight
    b. Overweight
    c. Obese

27. You find out that her mother is a type 2 diabetic and her father has high cholesterol. She is active about 3 times a week during recess at school (15 min) but spends most of her time on the weekends playing with dolls and coloring. She will ride her bike about once a week at home. Your next action based on the guidelines would be to:

    a. Draw a lipid profile
    b. Draw a lipid panel, AST, ALT and FBS
    c. Counsel regarding the 5210 program

Appendix B:

Code_____

Provider Childhood Obesity Survey

Posttest

The following questions are based on the Current Practice Guidelines

1. What Measurement triggers a diagnosis of obesity?
   a. BMI> 95th percentile/growth chart
   b. BMI>85th percentile/growth chart
   c. BMI >25
   d. BMI > 30
   e. Weight above average/age

2. What Measurement triggers a diagnosis of overweight?
   a. BMI> 95th percentile/growth chart
   b. BMI>85th percentile/growth chart
   c. BMI >25
   d. BMI > 30
   e. Weight above average/age

3. According to current practice guidelines at what age should lipid panels be ordered for children if BMI percentile is over 95%?
   a. Over the age of 2
   b. Over the age of 5
   c. Over the age of 10
   d. Over the age of 15

4. According to current practice guidelines what lab testing should be routinely ordered for children who are overweight/obese?
   a. TSH
   b. Hemoglobin A1c
   c. Lipid panel
   d. Insulin level

5. The recommended time for daily physical activity for children is
   a. 30 min
   b. 60 min
   c. based on age
   d. based on ability

6. Daily screen time should be limited to
   a. 1 hour
   b. 2 hours
   c. varies, it depends on if it is a weekday or weekend
   d. based on age

7. Which is not a component of the 5210 program?
    a. Recommendations for fruits and vegetables
    b. Recommendations for physical activity
    c. Recommendations for portion sizes
    d. Recommendations for sweetened beverages
    e. Recommendations for screen time

8. What is the most common symptom assessed in children regarding comorbidities?
    a. Papilledema
    b. Thyroid enlargement
    c. Striae
    d. Acanthosis Nigerians

9. What is not considered a comorbidity associated with childhood overweight/obesity?
    a. Nonalcoholic fatty liver disease
    b. Diabetes
    c. Sleep apnea
    d. Pancreatitis

10. Lipid panels should be done at what age if indicated by BMI percentile over the 85th percentile?
    a. Age 2
    b. Age 10
    c. Depends on risk assessment
    d. It should never be based on BMI percentile

The following are **case studies**. Please read the following case study and respond to the questions based on the case.

"JR" is an 11-year-old boy who comes to the clinic for his physical before entering 6th grade. At today's visit, he is 4 feet 6 inches tall and 98 pounds. His body mass index is 24, falling in the 95th percentile. His mom thinks he's just a "growing boy" and that his weight is not a problem.

11. Would JR met the criteria for:

a. Normal weight
b. Overweight
c. Obese

You obtain JR's family history. His mother and grandmother are both obese and have been diagnosed with type 2 diabetes and hypertension. His review of systems and physical exam are unremarkable.

12.Based on the previous question and this information would you:

    a. Assess risk
    b. Draw a lipid profile, ALT, AST and FBS
    c. Do nothing.

"SR" is a 6 year old female that comes to the clinic with a sore throat. You notice on her chart that her BMI is 18 and she is in the 89th percentile at 53 lbs. She is 3 feet 10 inches tall. She does not mention her weight to you, but you overhear her tell her mom that she wishes she could keep up with the other kids at school.

13.Would "SR" met criteria for:

a. Normal weight
b. Overweight
c. Obese

14. You find out that her mother is a type 2 diabetic and her father has high cholesterol. She is active about 3 times a week during recess at school (15 min) but spends most of her time on the weekends playing with dolls and coloring. She will ride her bike about once a week at home.

Your next action based on the guidelines would be to:

a. Draw a lipid profile
b. Draw a lipid panel, AST, ALT and FBS
c. Counsel regarding the 5210 program

Appendix C:

Provider Childhood Obesity Survey

Follow-Up

Providers' Current Practice

1. Are you aware of current clinical practice guidelines on childhood obesity? Yes No

2. In your current practice how frequently do you use the diagnosis of overweight with children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e.Never

3. In your current practice how frequently do you use the diagnosis of obesity with children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never

4. In your current practice how frequently do you order lab for overweight children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never

5. In your current practice what labs are ordered for overweight children age 2-17? (check all that apply)
    a. TSH
    b. Hemoglobin A1c
    c. Lipid panel
    d. Liver enzymes

6. In your current practice how frequently do you order lab for obese children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never

7. In your current practice what labs are ordered for obese children age 2-17? (check all that apply)
    a. TSH
    b. Hemoglobin A1c
    c. Lipid panel
    d. Liver enzymes

8. In your current practice how frequently do you provide education regarding the 5210 program components?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never

9. In your current practice how frequently do you assess for common comorbidities associated with overweight/obese children age 2-17?
    a. 1-3 times a week
    b. 3-6 times a week
    c. Daily
    d. Monthly
    e. Never