Application of a Family-Based Program for Pediatric Obesity in the Primary Care Setting: A Doctor of Nursing Practice Project

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Abstract

Childhood obesity is nationwide health epidemic that can predispose children and adolescents to comorbid conditions existing through adulthood, and is a cause of increasing healthcare needs and costs. Primary care providers are at the forefront of patient care when it comes to identifying children and adolescents who are overweight or obese, assessing their current health behaviors, educating them on healthier habits, and introducing the necessary treatment modalities. Implementation of a family-based intervention among pediatric overweight or obese patients within the primary care setting is one way to address this issue, and can improve quality of life and health behaviors. Guided by the Iowa Model, which uses evidence-based practice to promote quality in healthcare, the purpose of this project was to review the relevant literature regarding family-based interventions and how they impact health behaviors and pediatric quality of life, and to implement an evidence-based program that illustrated its efficacy. This project utilized the evidence-based Let's Go! 5-2-1-0 Childhood Obesity Prevention Program with children and adolescents who had a BMI > 85th percentile in a pediatric primary care setting. The goals of this project was to demonstrate the effectiveness of a family-based intervention for the treatment of pediatric overweight and obese patients within primary care, introduce a family-based healthy lifestyle program to a practice where treatment for this population was limited, and equip the providers with a program that can be sustainable for current and future patients.

Keywords: childhood, obesity, pediatric, healthy, behavior, quality of life, evidence-based, Iowa Model

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Introduction & Background

Pediatric or childhood obesity is a growing global health epidemic and is the most prevalent nutritional disorder among children and adolescents. Affecting approximately 34% of children in the United States (Xu & Xue, 2016), the National Center for Health Statistics found that the overall prevalence of pediatric obesity is at 18.5% (Gentile et al., 2018), whereas by age bracket, its prevalence is 13.9% among 2-5 years of age, 18.4% among 6-11 years of age, and 20.6% among 12-19 years of age (CDC, 2019). Some populations are at a higher risk of being overweight or obese in comparison to others, such as the impoverished and African American and Hispanic communities, where it affects nearly 40 percent of children (Maidenberg, 2016). With such an increase in the prevalence of this disease, there is direct correlation in regard to its medical costs, as expenses average $179 per year higher in obese children versus children with a normal body mass index (Xu & Xue, 2016).

A child's overweight or obesity (having excess adiposity) status is determined by calculating their body mass index (BMI), and assessed using a growth chart revised by the Centers for Disease Control and Prevention, which monitors pediatric growth over-time starting at the age of 2. BMI can be manually calculated by weight in kilograms (kg) divided by height in meters squared (m^2). Pediatric growth charts were first developed in 1977 by the National Center for Health Statistics (NCHS) to track the growth of infants, children, and adolescents in the United States (CDC, 2009).

The feasibility of using the NCHS pediatric growth charts among pediatricians, nurses, and parents in determining if the growth of a child is adequate, led to its adoption by the World

Health Organization for international use (CDC, 2009). When growth charts were first developed in 1977, it was recommended by NCHS that they be revised periodically (as necessary), however since its inception, the charts have been revised once by the Centers for Disease Control and Prevention in 2000 (CDC, 2009). The revised growth charts consist of 16 charts (8 for boys and 8 for girls), which is a change from the previous 14 charts, and includes two new body mass index-for-age charts for boys and girl, ages 2-20 years old (CDC, 2009). Children who have a BMI ranging 85%-95% are classified as overweight, and those with a BMI of 95% and above are classified as obese (Xu & Xue, 2016). Even though growth charts are not intended to be used as a sole diagnostic tool to diagnose obesity, it is a contributory tool in forming the overall clinical impression of the child (CDC, 2009).

Comorbidities of Pediatric Obesity

Aside from the physical changes that occur with being overweight or obese, there are also comorbid conditions that can develop. Childhood obesity predisposes the child to insulin resistance and type 2 diabetes, cardiovascular disease, hypertension, hyperlipidemia, liver and kidney diseases, reproductive dysfunction in adulthood, breathing disorders (i.e. sleep apnea, COPD), certain types of cancers (i.e. breast, bowel, uterine, prostate), and joint diseases such as osteoarthritis, pain in knees and lower back (Xu & Xue, 2016).

Along with the aforementioned physical comorbidities, there are also psychological burdens that can ensue. According to Sagar and Gupta (2017), various cross-sectional studies report a distinct correlation between increased body mass index and psychopathology, such as depression, anxiety, body shape concerns, and low self-esteem, which are all comorbid conditions that can derive from being overweight or obese. Within a study conducted to assess mental health disorders among 421 obese children utilizing the Childhood Psychopathology

Measurement Schedule (CPMS), the investigators reported that the prevalence of depression was found in 44.3% of these children compared to only 13.8% of non-obese children (Sagar & Gupta, 2017). Following depression, the other most frequently reported diagnoses were anxiety, eating disorder or episodes of binge eating, and attention deficit hyperactivity disorder (Sagar & Gupta, 2017).

The overarching domino effect of childhood obesity can impede quality of life. Quality of life is defined as a subjective evaluation that looks at multiple dimensions, such as physical, psychological, emotional, and social functioning of a person, in regard to their health and well-being (Black et al., 2014). Children and adolescents who are overweight or obese also have a much higher risk for poorer quality of life (Steele et al., 2011). They often have social anxieties and difficulties, are teased and victimized by their peers, are negatively regarded, and are excluded from social activities by their peers (Black et al., 2014). Parallel to child/adolescent quality of life reports, there are also parent-proxy measures that can be used to assess the parents' vantage point of the current state of their child(ren).

Black et al. (2014) conducted a pre-intervention survey of child and parent-reported quality of life among 204 overweight and obese children enrolled in a family-based weight loss intervention program. The purpose of their study was to evaluate how quality of life is impacted among overweight and obese children. They discovered that childhood BMI-z (weight adjusted for child age and sex) inversely related to quality of life, and most of the children and parents reported lower levels of emotional functioning (anxiety, depression, self-esteem) as BMI-z increased, compared to non-overweight and obese children. Tools used to measure pediatric quality of life can help healthcare providers gain a better understanding of the cumbersome

effects of childhood obesity, which in turn helps drive the development and dissemination of interventions and ideas to reduce its incidence.

Contributing Factors of Pediatric Obesity

Factors that create and maintain the incidence of pediatric obesity are multifaceted and include genetic, behavioral, and/or environmental circumstances. Genetic factors tend to be those that can derive from the genes of parents, and are often non-preventable, but can lead to children becoming overweight or obese (Xu & Xue, 2016). However, behavioral factors, such as the amount of screen-time, physical activity, and/or easy accessibility to high-calorie sugar-sweetened beverages and foods that are of low nutritional value (Xu & Xue, 2016), are preventable.

Screen-Time

Screen-time, or time spent using multiple forms of digital and electronic media including, watching television, digital video discs (DVD), or playing computer or video games, is directly related to a plethora of health consequences in children, including obesity (Yilmaz, Caylan, & Karacan, 2014). Biddle, Bengoechea, and Wiesner (2017) identified that increased screen-time causes an increase in sedentary lifestyle, thus an increase in weight. Yilmaz, Caylan, and Karacan (2014) also determined that the habit of eating while participating in media use among children and adolescents leads to an increase in calorie consumption, which increases weight. Such habits develop during the preschool years, and contribute to 1 in 4 American children watching four hours of television per day on average, and 8-18 year old children and adolescents watching more than six hours of daily screen-time. Each of these time intervals exceeds the recommendations of the American Academy of Pediatrics (Yilmaz, Caylan, & Karacan, 2014).

The American Academy of Pediatrics (2016) discourages the use of screen media other than for video chatting for children younger than 18 months, recommends choosing high quality digital programming for parents with children 18 to 24 months, limiting screen-time to 1 hour daily for children 2-5 years old, and no media usage during meals and for 1 hour before bedtime. For school-aged children and adolescents, there is no time limit for media use, however, it is suggested that they get the recommended daily amount of physical activity (1 hour) and adequate sleep (8-12 hours depending the age), do not sleep with media devices in their room, avoid exposure to devices or screens for 1 hour before bedtime, and that families designate media-free times together like family dinners (American Academy of Pediatrics, 2016). Such reduction in screen-time can be the first step in increasing healthier habits, including physical activity and diet.

Diet and Physical Activity

There are many environmental factors that play an important role in a child's development and maintenance of a healthy diet, and involvement in physical activity. Schools have been structured to optimize healthier habits in children, by reinforcing healthy eating and increasing physical activity behaviors. However, the child's lifestyle outside of the school setting when at home and within the community are crucial factors that can either add to or hinder access to affordable and healthy foods, and physical activity.

Physical activity and diet are key components in improving lifestyle changes and behavior, however sufficient lack of each attributes to pediatric obesity. Fedewa and Davis (2015) credit the rise of pediatric obesity to an increase in energy consumption with low energy usage. This can be linked to larger food portions, foods high in carbohydrates, trans fats, and sugar, a diet that lacks fruits and vegetables, and a decrease in physical activity (Fedewa &

Davis, 2015). Maidenberg (2016) found that one in three high school students do not exercise at least 20 minutes a day, three days per week, and that more than eight in ten adolescents eat fewer than five servings of fruits and vegetables daily.

Food is often used as a reward for achievements and good behavior and while most deem this positive reinforcement, it leads to improper food practices into adulthood and perpetuates inappropriate food relationships (Fedewa & Davis, 2015). It is imperative that parents and caregivers are educated about offering non-food choices for rewarding behavior, so that weight management and behavior are both positively impacted (Fedewa & Davis, 2015). Children being physically active for at least 60 minutes a day should also be discussed with parents, as an increase in physical activity can lead to a healthier lifestyle and better quality of life (Fedewa & Davis, 2015).

Instilling lifestyle changes that are sustainable is a difficult and ongoing challenge for children and adolescents, especially when parents are not involved in the changed efforts. Therefore, exploring evidence-based programs and activities, especially those involving the family, is essential in creating healthier lifestyles that can decrease the prevalence of childhood obesity.

Model and Implementation Framework

Evidence-Based Practice

Evidence-based practice grants healthcare professionals, specifically nurses, the ability to deliver quality health care to various populations, through the methodology of using critically appraised and scientifically based evidence (Majid et al., 2011). With gaining popularity due to its ability to offer swift solutions in handling clinical issues and providing better patient care, evidence-based practice also offers healthcare professionals the ability to shift their thinking and

perspectives from opinion-based, to more emphasis being placed on data that is extracted from prior studies. For these reasons, research articles that contributed to the evidence of pediatric obesity management were explored.

The articles selected for analysis and synthesis for this scholarly project were all initially questions and ideas that were further explored to determine if there is a need for this change, what the current literature reveals about the idea, do the benefit(s) outweigh the risk(s) (if any), and is there potential for such change to promote or prevent what is intended. All of the above are taken into consideration, with the goal of optimizing healthier outcomes to the specified population(s). Each article presented for synthesis demonstrated that childhood obesity is a major health threat, family-based interventions are key to improving and promoting healthier lifestyle changes within the pediatric population, and some noted how implementation within primary care clinics is optimal to maximize patient outcomes. These intentions became the focus of this scholarly project, and with the outcomes of each synthesized evidence-based article, this project used the evidence-based practice approach.

Implementation Framework

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care© (Iowa Model) was used for this project as the implementation framework. Permission was granted to use this framework by the University of Iowa Healthcare (Appendix A). The Iowa Model is a widely used and accepted framework for the implementation of evidence-based practice (EBP) (Buckwalter et al., 2017). This heuristic model is a pragmatic tool that incorporates multiple levels and feedback loops, through an algorithmic format (Figure 1).

The first step is to identify a triggering issue where an evidence-based practice change is warranted, which can be either knowledge-focused or problem-focused, and assessment of the

opportunities. The knowledge-focused or problem-focused triggers and opportunities can be on the clinical or patient level, organization or national level, or in regard to certain agency requirements and/or stipulations. The second step is to state the question or purpose of the project.

After proposing the question or purpose of the project, one must determine if the problem is a priority to the organization, practice, department, or unit. If it is noted that it is not imperative, it is necessary to consider possibly another issue or opportunity (first feedback loop). However, if it is noted to be a priority, then a team would be formed to develop, evaluate, and help implement the evidence-based practice change. It is here where interdisciplinary collaboration is keen for better evaluation and implementation for the change.

The next step is to gather and analyze the information related to the evidence-based practice change. A solid question is imperative, as the literature search conducted will be derived and directly correlated to the question. Once the literature search yields the articles, it is necessary to critique and synthesize the evidence and determine if it is scientifically succinct for the topic. If it is noted that there is not a sufficient amount of evidence to support the question, it is necessary to conduct further evidence and resemble ideas, which initiates a second feedback loop. If there is sufficient evidence for the topic, the next step is to design and pilot the practice change. After this, the next step is to evaluate the results and determine if the change is feasible and note if it improves outcomes, or shift what was initially intended to be changed. If not, the third feedback loop suggests considering alternatives and re-evaluate. However, if the results are appropriate, the next step is to implement and sustain the practice change.

Introduction of this practice change can be conducted across departments, programs, practices, and organizations. It is here where the changes are observed continually, re-evaluated

and re-analyzed, and reinfused as needed. Lastly, the results are then disseminated. This evidence-based practice framework operates as a pathway and guide to help identify issues, discover solutions, and implement changes. The continuous analysis of process and outcome variables, as well as feedback loops offered within this model allows for proper implementation, and ensures that it can aid in practice change adoption and adaptation.

Application of Implementation Framework

Identify Triggering Issues/Opportunities

The Institute of Medicine (IOM) and the American Academy of Pediatrics (AAP) note that discovering ways to prevent pediatric obesity, while promoting healthier behaviors and parent-child relationships is a top priority (Pratt et al., 2017). Taking into consideration the deleterious consequences of childhood obesity, it is imperative to design and implement interventions to decrease its prevalence. Within the realm of health promotion and education, previous interventions have attempted to prevent and treat childhood obesity in a variety of environmental aspects, such as within the clinics, schools, and communities.

However, there is an increased need for the delivery and dissemination of interventions within the family environment, as parents are the powerful change agents in the lives of their children. Although there is an increased need for familial participation and action at home, most interventions targeting the family environment face a number of barriers, including significant time commitment from parents, lack of adherence, and lack of understanding the health care parameters (Knowlden & Conrad, 2017). This is an aspect of care where primary care (providers) can have a positive influence and optimize the utilization of a family-centered intervention approach.

The primary care setting is an appropriate environment to assist in improving familial behaviors related to child health. This is due to most children visiting their primary care provider at least annually for wellness checks, caregivers being present during those visits, and the provider being viewed as having a high level of perceived authority among the caregivers who seek their care for health-related advice (Smith et al., 2018). Primary care providers can improve familial behaviors by implementing family-based interventions, through educational efforts that utilize video instruction, pamphlets, and/or weekly follow-up via in person or telephone.

Clinicians can directly address familial concerns in multiple ways to improve quality of life and behavior. Primary healthcare professionals who are at the frontline of preventing pediatric obesity, often report that it is the maladaptive behavior of the parent(s) within family management practices that is associated with pediatric weight gain, and hinders the effective implementation of healthy lifestyle recommendations in young children (Smith et al., 2017). Preventive interventions that teach caregivers the skills required to implement behavior change in accordance with expert guidelines for pediatric obesity prevention are needed.

Recent analysis of pediatric obesity intervention data concludes that programs involving parents are among the most influential and efficacious. This is due to parental influence and modelling healthy lifestyle habits, and opportunities for healthy nutrition and physical activity (Smith et al., 2017). The significance of familial involvement denotes that pediatric weight and health behaviors may be improved when parents attend and are directly involved in health-related classes and activities. Similar findings suggest comparable outcomes when parents are educated and provided information on positive lifestyle modifications, as well as being provided with tools for effective and positive parenting skills and lifestyle components (Smith et al., 2017). Therefore, integrating family-centered interventions and teachings for the management of

childhood obesity may result in significant improvement in several areas. These areas include knowledge of the illness, management of lifestyle modifications, such as dietary changes and increased physical activity, prevention in the event of future children, and improved quality of life.

Purpose

The aim of this project measured the impact of the evidence-based Let's Go! 5-2-1-0 Childhood Obesity Prevention Program, on the quality of life and health behaviors of children with a BMI above 85%. Weekly follow-up with education and counseling was a novel practice for this clinical site, as the usual care for patients with a BMI >85th percentile includes either a yearly check-in during the wellness visit or a referral to an obesity clinic, where there is frequently a lack of compliance and the patients are lost in follow-up. Additionally, there are currently no effective measures or interventions in place to assist patients with a BMI > 85th percentile.

PICOT

The PICOT format offers guidance in answering clinical study questions through an easy mnemonic approach. Each letter represents different parts of the question: P – sample of subjects for the study, I – the intervention or treatment in which the subjects will be enrolled, C – the reference group or comparison subjects, O – outcome to be measured, and T – the time/duration of data collection (Riva et al., 2012). The PICOT question for this project is: In overweight and obese children and adolescents aged 6-17 years old (P) at a pediatric primary care clinic, what is the effect of the 5-2-1-0 Childhood Obesity Prevention Program (I), compared to usual care (C), on behavioral changes and quality of life (O) within an 8-week timeframe (T)?

Let's Go! 5-2-1-0

Let's Go! 5-2-1-0 Childhood Obesity Prevention Program is a community-based approach to improve healthy eating and physical activity in overweight and obese children (Roger et al., 2013). It was created in 2006 by Maine Health in response to concerns about the health and economic impacts of childhood obesity in Maine, and is now recognized throughout the United States as a community-based behavioral intervention to address childhood obesity (Roger et al., 2013). It has six guiding principles: reaching communities through multiple settings, emphasizing healthy eating and active living for all children, promoting healthy behaviors and developing policies to support them, incorporating strategies that are evidence-based, creating messages that are positive and never stigmatizing, and ensuring that involvement is always voluntary (MaineHealth, 2020).

The 5-2-1-0 program can be implemented in schools, child care programs, afterschool programs, health care practices, worksites, and community sites (Roger et al., 2013). The program was found to be feasible in many school and community settings in the United States (Gentile et al., 2018), and its Healthy Habits Questionnaire has demonstrated usability and feasibility within the primary care setting (Camp, Robert, & Kelly, 2020). This multi-setting approach follows the socioecological model that recognizes how behaviors are shaped by family customs, but can be positively impacted to promote sustainable behavior change (Roger et al., 2013).

The mnemonic, 5-2-1-0, represents the daily suggestion that children eat at least 5 servings of fruits and vegetables, limit recreational screen-time to 2 or fewer hours, be physically active for at least 1 hour, and drink 0 sugary beverages (MaineHealth, 2020). Screened questions on diet and activity habits can assist in identifying the need for counseling, therefore, the Healthy Habits Questionnaire (HHQ) was created and first initiated within the primary care setting. The

HHQ is a 10-item behavioral screening tool that is used by providers to assess the risk of obesity and the need for behavior change, as well as to facilitate education to the family (Camp, Robert, & Kelly, 2020).

Although 5-2-1-0 is a community-based program, it has potential to be beneficial as a family-based intervention. Gentile et al. (2018) conducted a 7-month study among children aged 5-13 years old, who attended the Young Men's Christian Association (YMCA) summer day camp in 2016. There was random assignment to an intervention group (n=14) and control group (n=26), where the intervention group received invitations to monthly family cooking classes (once per month), family physical activity classes (twice per month), and 5-2-1-0 healthy habits messaging by monthly email or postal mail for the study duration (Gentile et al., 2018).

Both the intervention and control group had anthropometric measurements pre- and post-intervention, and received a knowledge acquisition survey and a healthy habits survey to complete pre and post (Gentile et al., 2018). Results for this study showed an improvement in the number of servings of fruits and vegetables per day (42.9% vs. 19.2%) and a decrease in consumption of sugary drinks at follow-up (21.4% vs. 7.7%) among the children in the intervention group (Gentile et al., 2018). Even though there were no significant changes in 5-2-1-0 habits between the intervention and control groups, this study demonstrated the feasibility of incorporating 5-2-1-0 into family-based activity (Gentile et al, 2018).

Form a Team

The project was conducted at a private, pediatric primary care clinic in Central Virginia. This clinic has two locations, one in Charlottesville, Virginia and the other in Crozet, Virginia. This project will be conducted at the main clinic in Charlottesville, Virginia. This practice has 6 pediatricians and 4 pediatric nurse practitioners, who generally see a combined 70-80 patients

per day. There are also registered nurses, licensed practical nurses, certified nursing assistants, and administrative staff who provide assistance to the healthcare providers and patients. This practice also serves as a clinical training site for pediatric nurse practitioner students, medical students, as well as physician assistant students from local universities.

Assemble the Evidence

A literature search was conducted, with results focused on family-based interventions for pediatric obesity, as well as the importance of understanding how it affects one's quality of life and behavior. A medical librarian was consulted to assist in ensuring that all relevant data and information was included in the search strategies to obtain the most pertinent articles to address the PICOT question. To gather a comprehensive review of the literature, four databases (PubMed, Web of Science, CINAHL, and Ovid Medline) were used. For each database, the year of the publication was limited to the last 10 years (2010 through 2020).

The search terms "*health literacy," "family-based," "childhood," "pediatric," "paediatric,"* and *"obesity"* were used in each databases with the following search parameters to obtain a comprehensive search: (health literacy OR family-based) AND (childhood OR pediatric OR paediatric) AND obesity. To ensure more transparency, the search details were: (("health literacy"[MeSH Terms] OR ("health"[All Fields] AND "literacy"[All Fields]) OR "health literacy"[All Fields]) OR family-based[All Fields]) AND (("Childhood"[Journal] OR "childhood"[All Fields]) OR ("pediatrics"[MeSH Terms] OR "pediatrics"[All Fields] OR "pediatric"[All Fields]) OR ("pediatrics"[MeSH Terms] OR "pediatrics"[All Fields] OR "paediatric"[All Fields])) AND ("obesity"[MeSH Terms] OR "obesity"[All Fields]) for each database.

For PubMed, the species type was limited to humans, and was filtered to only include articles of the English language, which the results yielded 376 articles. Web of Science had 531 articles that were included for further review, after limiting the document type to solely articles. For CINAHL, the search was refined to only include academic journals, which yielded 369 articles for review. Finally, Ovid Medline had 312 articles for review, after the search criteria was limited to the English language, human species, and all child age groups (0 to 18 years). There were a total of 1588 articles retrieved from the databases, and none obtained from other sources. After removal of duplicated articles (n=878), there were 710 articles remaining for review. A detailed depiction of the exclusion criteria is listed in Figure 2.

Appraisal of the Evidence

Evidence about family-based interventions affecting pediatric obesity was appraised. Evidence was also collected to determine if family-based interventions improve behavior and quality of life. The literature search yielded 6 articles that were accepted for analysis and synthesis of evidence. The study design of the 6 selected articles consisted of 5 randomized controlled trials and 1 quasi-experimental (mixed methods) design.

Level of Evidence

The strength and quality (level of evidence) of each article was assessed by utilizing the John Hopkins Nursing Evidence-Based Practice Appraisal (JHNEBP) Tool (Dang & Dearholt, 2017) (Figure 3.1 and Figure 3.2), with copyright permission given by John Hopkins Medicine (Appendix B). The purpose of this tool is to ensure that the most up-to-date search findings and best practices are appropriately incorporated into patient care, through this problem-solving approach to clinical decision-making, utilizing a three-step process known as PET: practice question, evidence, and translation (Dang & Dearholt, 2017).

After finalization of the exclusion and inclusion criteria, 6 articles were identified as being aligned with the purpose of this scholarly project. The final evidence sources retained for analysis are presented in Table 1. For this review and synthesis, there were 5 randomized controlled trials, which all yielded level I evidence and good (B) quality. There was one article that was quasi-experimental and was a level II and good (B) quality. The 5 randomized controlled trials addressed pediatric obesity by assessing educational sessions/interventions and family involvement through care and demonstration. Some of the articles focused on how the intervention not only improved BMI-z scores and weight outcomes, but also quality of life and behavior/habits. The same can be said about the quasi-experimental article that used mixed methods (quantitative and qualitative) to address quality of life and adherence to behavioral changes. Such good quality studies produced more consistent data for the scope of this review and drew conclusions that were fairly definitive.

Publication Bias

In an effort to reduce the risk of publication bias, a search of the gray literature was conducted by searching the key terms: *"pediatric obesity"* AND *"family-interventions"* in the Google Scholar search engine. The first 60 results were reviewed. In searching the two terms in conjunction, there was no evidence of publication bias based on the gray literature. The findings were also not consistent with the findings in the systematic review. Some of the themes in the gray literature were in reference to analyzing severe obesity, conceptual challenges, family psychology, underserved rural settings, parent-only interventions, the role of the father in pediatric obesity prevention, and binge eating.

Synthesis of the Evidence

Quality of Life

Croker et al. (2012) examined the impact of a 6-month behavioral family-based intervention compared to a wait-list control group among 72 families. The families were randomly allocated to either the intervention or control group, with the hopes of gaining a better understanding of how family-based interventions can have an impact on waist circumference, body composition, blood pressure, well-being (quality of life – QOL), and eating attitudes. Through this study and in utilizing the Pediatric Quality of Life assessment tool, they found that pre-intervention children's quality of life (child and parent-reported) were below average for both the intervention and control group, however post-intervention, parent-reported child quality of life improved in the treatment group *($p<0.05$).*

Riggs et al. (2014) conducted a quasi-experimental study to determine the effectiveness of a family-based group intervention (the Family Wellness Program – FWP) and its impact on healthy lifestyle changes among overweight and obese children and their family. This was a convenience sample of 38 parent-child pairs, who were being assessed at two separate primary care clinics. Parents completed a self-administered survey that assessed child quality of life and parent/child use of behavioral skills. Child quality of life was measured using a parent-proxy report version of the Pediatric Quality of Life Inventory. Riggs et al. (2014) found that there was statistical significance in regard to child quality of life *($p=0.002$)* from baseline to post-treatment among the physical, emotional, social, and school functioning domains of the survey.

As a primary outcome variable, Steele et al. (2011) examined child and parent-reported quality of life for their randomized controlled trial study, which examined the effectiveness of a family-based behavioral group intervention (Positively Fit) versus a brief family intervention among 93 families with overweight or obese children. For those who were randomized to the brief family intervention group, there was no change in child-reported quality of life nor parent-

report quality of life. However, parents of the Positively Fit intervention group reported a significantly greater increase in their children's quality of life at post-intervention *($p<0.05$)*, and there was an increase in the child's self-reported quality of life.

Although a majority of the articles assessing quality of life showed improvement post-intervention, Taylor et al. (2015) showed no statistical changes in response to the intervention. Taylor et al. (2015) conducted a randomized-controlled trail of a family-based intervention, where families were assessed for 2-years to determine if limited expert involvement but frequent contact improved patient outcomes. 206 overweight and obese children were randomized to the intervention or control group (usual care), where quality of life was assessed using the Pediatric Quality of Life assessment tool. The authors note that there was no statistical significance in regard to quality of life, although there were noted differences among the groups in regard to improved diet and increased physical activity. Future suggestions recommend that a shorter study with such intervention be conducted, as shorter studies not only show better BMI-z scores, but QOL.

Behavioral Modification

Although there were different methodologies and interventions used within the articles, each study contributed to some degree of positive behavioral change, either among the parent, child, or both. For Croker et al. (2012), aside from quality of life improvements, there was also noted improvement within the intervention group versus the control group in regard to dietary habits *($p<0.005$).* Although Taylor et al. (2015) study did not show any improvement in the quality of life of the population, there was however improvement in the knowledge of healthier eating habits among parents and their children, as well as an increase in the consumption of healthier foods and a decrease in non-core foods and beverages *($p=0.002$)*. Such results were

derived from the family-based intervention that addressed physical activity, dietary modifications, and frequent follow-up.

Similar to Crocker et al., (2012), where there was improvement in quality of life as well as behavioral changes, Riggs et al. (2014) conducted qualitative interviews to determine if parents felt supported in adjusting previous dietary and physical behaviors. For those who were successful within the program, it was found that most attributed their success to the positive support and feasibility of the program. Quantitative findings correlated parental success through improved parent self-reported use of behavioral skills between pre- and post-intervention data.

A different methodological approach to familial-based interventions, Knowlden & Conrad (2018) performed a randomized controlled trial assessing the use of a web-based education tool (EMPOWER), to assess how maternal usage of the tool impacted better fruit and vegetable consumption, physical activity, sugar-free beverage intake (versus sugar-sweetened beverages), and screen time among 57 overweight/obese children. Families were randomly allocated among an experimental group, where social cognitive theory was utilized, or the control group. Knowlden & Conrad (2018) found that following the intervention, there was a significant difference in child behaviors between the children in the treatment and control conditions. Children in the treatment group had improved fruit and vegetable intake *($p=0.033$)*, increase in physical activity *($p=0.024$)*, and a decrease in screen time *($p=0.005$)* as compared to children in the control group. Between both groups, there was an increase in child consumption of sugar-free beverages *($p<0.001$)*.

Also exploring a different approach to behavioral modifications and patient outcomes, as Knowlden & Conrad (2018), Theim et al. (2013) measured how adherence to family-based interventions improved patient outcomes. They conducted a randomized controlled trial, where

101 overweight children and their parent(s) participated in a 20-week and 16-week behavioral program. The families were initially randomized into a 20-week family behavioral weight loss treatment program, then again to a 16-week program, where they were randomly assigned into either a socially or behaviorally-based weight management group. It was found that within the initial treatment group (20-week program), children reported being more physically active, able to control portion sizes, and able to limit the amount of high-fat/high-calorie foods. Such outcomes improved from baseline to immediate post-intervention, due to child and parent adherence. When the children were allocated to the different groups (16-week program), those in the behaviorally-based weight management program noted continued improvement and progress up to 2 years post-intervention *($p<0.001$)*, in comparison to the socially-based program *($p>0.11$)*.

Discussion

The goal of this synthesis review was to evaluate current evidence of family-based interventions impact on pediatric obesity. Improvements in knowledge of healthier choices, quality of life, and previous dietary and physical activity behaviors all demonstrated positive correlations with the family-based interventions among the studies analyzed. The literature suggested that family-based interventions should be further explored within primary care centers, as Riggs et al. (2014) and Taylor et al. (2015) postulated such interventions would be feasible and adaptable in primary care settings. Such transition from inpatient or specialty centers to primary care clinics is more pragmatic and can have improved patient outcomes, as primary care sets the tone and can contribute to preventive measures and promote healthier behaviors.

Initially, the search criteria for this review of literature contained the term ‘health literacy.’ Health literacy was thought to be a factor in the utilization of written program materials based on the family’s low or high literacy score. However, the impact of health literacy

on the implementation of this project was not deemed significant and was removed from the search.

Design and Pilot the Practice Change

The purpose of this project measured the impact of the evidence-based Let's Go! 5-2-1-0 Childhood Obesity Prevention Program, on the quality of life and health behaviors of children with a BMI above 85%.

Setting and Sample

The EBP project was conducted within a primary care pediatric clinic with full collaboration, support, and permission of the providers and clinical staff (Appendix C). An anecdotal report of the prevalence of children and adolescents with a BMI > 85th percentile at this clinic among the population is estimated to be 20%, based on the assumption of the practice site mentor.

Children and adolescents aged 6-17 years old, have a body mass index (BMI) categorized as overweight (≥ 85 percentile) or obese (≥ 95 percentile), and have at least one parent or guardian were approached to participate. Exclusion criteria for participation was non-English speaking, no access to a laptop or computer, or no parental email address.

Protection of Human Subjects

Since the design and purpose of this project was to translate evidence into practice, there was no IRB oversight. However, the proposal was submitted to the IRB for determination prior to starting the intervention. Permission was granted through the UVA IRB after completion of the Determination of Human Subjects Research Form (Appendix D). The need for consent and assent was deemed unnecessary, and the doctoral student responded to any changes from the IRB, as needed. Participation was voluntary and assurance was given that all results will remain

confidential. De-identified data will be stored within Libra, which is a secure storage site for UVA. Families who declined participation in this intervention received the usual and ordinary care for their children in the clinic.

Measures

Demographics. Demographic characteristics of the child, such as age and gender, as well as their BMI were obtained from the practice site mentor. Data such as which race the child and participating parent identify as and socioeconomic status of the family were obtained using a HIPAA compliant Qualtrics survey that was emailed. There was an option (i.e. "prefer not to say") for parents who wish not to answer the race and socioeconomic portion of the survey.

Quality of Life. Measurement of health-related quality of life has shown to have utility in the pediatric healthcare setting for assessing the effects of chronic health conditions (Anderson et al., 2017). For this project, the Pediatric Quality of Life Inventory (PedsQL™) 4.0 Generic Core Scales© was used. PedsQL™ is an instrument used to measure health-related quality of life (HRQOL) in healthy children and adolescents aged 2-18 years, and those with acute and chronic health conditions. This measure consists of parent-proxy report (Appendix E) and child report (Appendix F), which has minimal respondent burden as the questions are written at a third-to-sixth grade reading level, and it takes approximately 5 minutes to administer (Hullman et al, 2011). Each questionnaire has 23 items (8 for physical health and 15 for psychosocial health) rated on a 5-point ordinal scale that assess physical functioning (8 items), emotional functioning (5 items), social functioning (5 items), and school functioning (5 items) for the preceding month (Hullman et al., 2011).

For score interpretation, the range on subscales and the overall scale is 0-100, with lower scores indicating a poorer quality of life and higher scores indicating better quality of life

(Hullman et al., 2011). Anderson et al. (2017) note that differences between parent-proxy and child self-report on the PedsQL™ questionnaires have been reported for healthier children, but there is better agreement among parents and chronically sick children. Taking this into consideration, both parent and child reports should be obtained, as they offer different perspectives. The reliability of this instrument has been demonstrated in age 2-16 years as excellent (Cronbach's $\alpha = 0.89$ child; 0.92 parent report), with acceptable construct validity (Anderson et al., 2017). Permission was granted to use this measuring tool by the copyright holder and distribution site (Appendix G).

Behavior. The 5-2-1-0 Healthy Habits Questionnaire (HHQ) is a 1-page behavioral assessment tool used to gather basic health lifestyle information from parents and children, and was utilized in this project. The HHQ can be given to parents with children between ages 2-9 (Appendix H) and children 10 and older (Appendix I). There are 10 questions that cover fruit and vegetable intake, family meals and daily breakfast, screen-time, location of televisions in the home, physical activity, sugary beverage intake, and fast-food consumption (Polacsek et al., 2009). Parents are able to provide "yes" or "no" answers, or quantified amounts where queried. The final question asks participants to check 1 item they would like to change from a list of behaviors using the items in the questionnaire.

Psychometrics (reliability and validity) could not be established on the 5-2-1-0 Healthy Habits Questionnaire, however, Dedekian, et al. (2019) and Polacsek et al. (2009) note that it was developed from evidence-based recommendations of the American Academy of Pediatrics to prompt discussion among the child, parent(s), and provider about healthy behaviors. Camp, Robert, and Kelly (2020) explain that the screening assessment is feasible and useful in the primary care setting, and it is an efficacious message and algorithm (Rogers et al., 2013).

Polacsek et al. (2009) note that usage of the screening tool demonstrated improved family management of risk behaviors and a promising primary-care based approach to address pediatric obesity. Also, sustained use of the screening tool in 12 urban and rural primary care clinics in Maine was found 3 years after program completion (Polacsek et al., 2009). Usage of this screening tool in quality improvement and studies have been publicized in various journals, including the *Pediatrics* journal created by the American Academy of Pediatrics. Permission was granted to use this measuring tool from the copyright holder (Appendix J).

Weekly Follow-up. Support of patient self-management is keen for effective care and improved outcomes in patients dealing with chronic illness (Coleman & Newton, 2005). Providers can support patient self-management by structuring patient-provider interactions to identify problems from the patients' perspective, adherence to changes and treatment modalities, and address any barriers to care (Coleman & Newton, 2005). Such structuring can be through implementing frequent patient follow-up through either weekly phone calls or weekly telehealth visits.

Whitlock et al. (2000) conducted a 3-month study to determine if weekly telehealth visits improved outcomes for patients with type-II diabetes. They concluded that weekly telemedicine approaches had a positive impact on patient blood glucose control, improved communication between the patient and health care provider, and better provider access to important patient information on a frequent basis (Whitlock et al., 2000). It was also noted that long-term use of frequent follow-up can lead to reduction or elimination of complications related to diabetes mellitus (Whitlock et al., 2000).

The creators of the Let's Go! 5-2-1-0 Childhood Obesity Prevention Program recommend that providers follow the Management and Treatment Algorithm for follow-up visits in patients

with a BMI >85th percentile (Appendix K). Follow-up within the primary care setting is routinely conducted every 2-4 weeks or monthly, as determined by the patient, family, and provider, and the conversations should be between 15-20 minutes (MaineHealth. 2020). This EBP project was a novel approach to follow-up visits within primary care for pediatric overweight or obese patients, as follow-ups were conducted weekly by the DNP student. This project had a duration of 8 weeks, as that has demonstrated automaticity of habit formation (Gardner, 2012). Javorsky, Robinson, and Kimball (2014) noted that managing follow-up visits is an evidence-based approach that can improve access to providers without compromising or restricting care, and this project intends to support this notion.

Thematic analysis of the weekly follow-up data was conducted. Although not an initial part of the reporting or anticipated data collection process, substantiality to the overall outcome of this project deemed it necessary to discuss. However, its discussion is not intended to create a mixed methods approach to this project, but rather to add significant value to the quantitative data. The Iowa model allows for feedback loops and adjustments to be made throughout the implementation process; therefore, this addition and change is reasonable.

Procedures

Prior to implementation, providers and clinical staff were educated on the 5-2-1-0 (5 daily servings of fruits/veggies, 2 hours of screen time or less daily, 1 hour of physical activity, and 0 sugary beverages) Childhood Obesity Prevention Program, the screening tools, and purpose of weekly follow-up for knowledge-based purposes only.

Recruitment Process. A contact list of 23 children and adolescents meeting the inclusion criteria was procured by the practice site mentor, through a secure link and uploading system connected to the VPN drive. Prior to the submission of names by the practice, each family was

debriefed about the project and asked if they would like to receive further information. For the safety and protection of each participant, the practice site mentor and practice partners determined that it was best to pre-screen families prior to relinquishing their information and contact by the DNP student. Once agreed upon and contact information disseminated, the guarantor of each child and adolescent was contacted by the DNP student. This resulted in seven families being unreachable after two phone calls with resultant voicemails, two families declining further information, and ten families lost to attrition after enrolling.

The cause of cessation of participation among the ten families included an ill family member (n = 1), change in family status (divorce) (n = 1), concern for upcoming holidays and the interference (n = 3), and unknown reasoning (stop in answering calls/responding to text messages) (n = 5). Of the ten families, three completed the pre-questionnaires only and did not progress any further, one family completed the pre-questionnaire and two weeks of the program, one family completed the pre-questionnaires and one week of the program, and the remaining five did not complete the pre-questionnaires and discussed with the DNP student their inability to complete.

To increase enrollment, the practice site mentor contacted two other pediatric primary care facilities, one in Charlottesville, VA and the other in Palmyra, VA, where there was mutual interest in the project. In order to enroll participants from two outside facilities, the IRB instructed the DNP student to create a standard flyer that was approved for facility dissemination (Appendix L). Once the flyer was distributed to the two outside practices, two other families initially enrolled into the program, but discontinued due to a child's reported oral aversion to fruits and vegetables, and a family with an already overwhelming schedule. Neither family completed the pre-questionnaires or any week of the process.

Project Implementation. After invitation by the DNP student, four families agreed to participate. The demographic form, the PedsQL™ instrument, and Healthy Habits Questionnaire were emailed to each family for review. Parents were given the website to obtain access to the handouts and parent information of the 5-2-1-0 program.

The DNP student along with a statistician created the demographic form and manually input the questions for the PedsQL™ and Healthy Habits Questionnaire in the Qualtrics survey database for dispersing. There were no alterations to the measuring instruments and the appropriate trademark and copyright information was added. Per the copyright holder for the PedsQL™ questionnaire, the electronic version in Qualtrics was sent for review and approval (Appendix M). For the PedsQL™ form, the parent filled out the parent-proxy form and the child completed the pediatric form, in case there is a perceived difference in quality of life. For the Healthy Habits Questionnaire, if the child was between 2-9 years old, the parent completed the form, whereas, children over the age of 10 completed the questionnaire. Phone conversations were conducted to go over each form prior to submission. Completed information and forms from each parent dyad was emailed to the DNP student.

Weekly Follow-up. A phone conversation was conducted with each family to go over the pre-intervention instruments data, discuss the 5-2-1-0 program to ensure that the parent understood the program, as well as provide information to access the parent site of the 5-2-1-0 program through MaineHealth for more information. Weekly follow-up was conducted through phone or video communication for the full duration of the 8-week intervention, according to family preference, with scripted detail for each encounter. The DNP student was flexible during each conversation, in order to remain open and aware of the need(s) of each family. The time spent was allocated to 25% of counseling and 75% in educating the family. Phone calls were

allocated to Saturdays to decrease work and after work family-time disruption; however, the DNP student was flexible to families requesting a different day.

Each follow-up phone call was timed between 15-20 minutes and used to determine if the participating parent and child have been following the 5-2-1-0 plan. For each of the 8 weeks, the conversation started off with "how are things going" with the participating parent for open-ended conversation. There was daily incorporation of the 5-2-1-0 program, however, there was biweekly focus targeting one of the habits of the 5-2-1-0 plan (Table 2). For the final week, the parent was asked "was this program beneficial or helpful to you and the child," and "is this something that you would recommend to your child's healthcare provider?"

During each week, documentation of the encounter was transcribed verbatim by the DNP student into an Excel spreadsheet. In order to utilize this data for reporting purposes, the DNP student and statistician used a modified textual, descriptive approach to identify common themes that emerged each week. Both collated and organized the responses using a tabled Word document, and the statistician who is trained in qualitative methods, as well as the DNP student grouped the responses into themes separately, then together discussed any commonalities or differences. To limit bias, if discrepancies existed, it was determined that the DNP student and statistician would discuss concerns and come to an agreement by involving a third team member. For this project, there were no discrepancies among the two individuals.

Project Conclusion. Throughout the 8-week program, adjustments were made to the delivery of the program as needed to ensure program efficacy. Any adjustments made were based on parental concern or factors beyond the control of families and the DNP student, specifically the impact of COVID-19.

At the conclusion of the intervention, the PedsQL™ and Healthy Habits Questionnaire was emailed via the Qualtrics database for post-intervention data. The post-intervention data was obtained and compared to the pre-intervention data to determine if there was any improvement in quality of life and healthy habits based on the intervention and parent involvement. Anthropometric changes were not evaluated during this intervention, due to the short timeframe of the study.

Data Collection and Analysis

The project took place October 2020 to the start of January 2021, and was overseen by the practice site mentor and DNP advisor. Data was collected throughout the project and stored using Excel, analyzed using the IBM© Statistical Package for Social Sciences (SPSS) version 27, and thematic analysis was conducted for the weekly follow-up data. Behavioral changes based on the Healthy Habits Questionnaire were noted pre- and post-intervention based on the answers provided, therefore, no statistical tests were conducted. IBM© SPSS data processor was used to compute the pre- and post-intervention data of the PedsQL™ questionnaire. Each parent and child completed either the pediatric questionnaire or the parent-proxy version, and scores were calculated by the DNP student utilizing the appropriate instructions (Appendix N).

All pre- and post-questionnaires for each parent dyad were tallied and documented within the Excel spreadsheet. The pre-parent and child, as well as post-parent and child scores were calculated individually for the physical component of the questionnaire, as well as the combined psychosocial (emotional, social, and school functioning) component. Each question answered was scored from 0-100, based on a 5-point ordinal scale. A selection of 0 on the questionnaire gave the score of 100, selection of 1 equaled a score of 75, selection of 2 indicated a score of 50, selection of 3 was a score of 25, and selecting 4 was a score of 0 (Appendix N). The scoring for

each component was the summation of the items over the number of items answered in each category. The total scores for the parent and child included the overall summation of the physical and psychosocial scores over the number of items answered in all categories. The documented data was then transcribed into SPSS by the statistician and DNP student for further analysis.

The use of the Iowa Model for this evidence-based practice project encouraged the continuous analysis of the process and outcome variables, to assist in adequate adaptation by each family and adoption of the intervention into routine clinical practice. Process variables of this project included practice site collaboration, parental and child/adolescent involvement, weekly follow-up, and family adherence. Outcome variables were changes in quality of life and health behaviors.

Procedures were periodically modified, as needed, in accordance with the Iowa Model. Such modifications were continuous evaluation of the process variables, feedback from the practice site mentor, IRB, and each individual family, COVID-19 changes/restrictions, holiday plans, and weather/nature changes. Data collection was for a period of 8 weeks grouped for each participant spanning from October 5, 2020 through January 2, 2021. The enrollment process was offered to families from October 5, 2020 through November 9, 2020 to increase participation. After completion of the project, descriptive statistics in the form of mean, median, standard deviation, and minimum and maximum values were used to describe the summary of data (pre- and post-scores). Thematic analysis of the weekly-follow-up data was also conducted by the DNP student and statistician.

The Excel spreadsheet containing the patient and weekly follow-up data was stored on a highly secured HIPAA-space VPN drive, which was setup by the UVA IT department, and

managed by the DNP student. Highly secure data training was conducted by the DNP student in order to gain access to this drive prior to project implementation.

Results

From the period of October 5, 2020 to January 2, 2021, four families completed the program which included the pre-questionnaires, the 8-week process with weekly follow-up, and the post-questionnaires. Each was enrolled and started the program on a different day, thus the broad timeframe of project implementation.

Characteristics of sample. The age range of the child participants was 9 through 17 years, with an average age of 13 years (*SD* = 3.65). The body mass index of the participants ranged from 27.81 to 35.44, with the average being 31.40, and having percentiles ranging between 97^{th}-99^{th} and averaging 98.5 (*SD* = 1). There were two male and two female participants, offering gender balance among the population. The racial makeup of the sample included two White/Caucasians, one Black/African American, and another classified as multiracial or biracial. Socioeconomically, the household incomes ranged from $50,000-$75,000 to $100,000-149,000.

Each child or adolescent had a parent involved in the 8-week process for the full duration, and those with split households and visitation (n = 2) also had complete cooperation by the other parent. In the instance of a split household, the DNP student only contacted the primary caregiver/guarantor. There was one participant who was 17 years old (they turned 18 prior to completion), who was the primary contact during the process. For this case, the parent gave verbal consent to contact this participant weekly. Although this participant was the primary contact each week, the parent also provided input.

PedsQL™ Data. Table 3 illustrates the descriptive statistics computed. Scores for the parent and child pre-intervention data was gathered at the start of the program, while the parent and child post-intervention data was collected at the culmination of their program. The mean for the pre-parent physical scoring is 69.59 (*SD* = 25.46), with a minimum score of 40.63 and a maximum score of 93.75. Post-parent physical scoring had a mean of 77.25 (*SD* = 18.57) with a minimum score of 50.00 and maximum score of 90.00. The difference among the post-parent and pre-parent physical scoring had a mean of 7.65 (*SD* = 13.10) with a minimum score of -5.75 and maximum score of 25.00.

Pre-child physical scoring had a mean of 81.93 (*SD* = 9.30) with a minimum score of 71.88 and a maximum score of 93.75, whereas the post-child physical scoring had a mean of 81.75 (*SD* = 2.87) with a minimum of 78.00 and a maximum of 84.00. The difference among the post-child and pre-child physical scoring had a mean of -0.18 (*SD* = 9.14), with a minimum score of -9.75 and a maximum score of 12.12.

Pre-parent psychosocial scoring had a mean of 62.08 (*SD* = 14.03) with a minimum of 46.67 and a maximum score of 78.33, and the post-parent psychosocial scoring had a means of 76.25 (*SD* = 12.60) with a minimum score of 68.00 and a maximum score of 95.00. The difference among the post-parent psychosocial and pre-parent psychosocial scoring had a means of 14.17 (*SD* = 7.49) with a minimum score of 3.67 and a maximum score of 21.63.

Pre-child psychosocial scoring had a mean of 73.33 (*SD* = 8.49) with a minimum score of 65.00 and a maximum score of 85.00, whereas the post-child psychosocial scoring had a mean of 79.00 (*SD* = 6.68) with a minimum of 70.00 and a maximum of 85.00. The difference among the post-child and pre-child psychosocial scoring had a mean of 5.67 (*SD* = 7.01), with a minimum score of -2.00 and a maximum score of 15.00.

Lastly, the total pre-parent scoring, which is the summation of the physical and psychosocial categories, had a mean of 64.75 (*SD* = 17.63) with a minimum score of 45.00 and a maximum score of 82.00, and the total post-parent scoring had a mean of 76.50 (*SD* = 12.76), with a minimum score of 62.00 and maximum score of 93.00. The difference among the total post-parent scoring and total pre-parent scoring had a mean of 11.75 (*SD* =8.54) with a minimum score of 0.00 and a maximum score of 19.00. The total pre-child scoring had a mean of 76.25 (*SD* = 4.64) with a minimum score of 72.00 and maximum score of 82.00, whereas the total post-child had a mean of 80.25 (*SD* = 4.64) with a minimum score of 74.00 and a maximum score of 85.00. The difference among the total post-child and total pre-child scoring had a mean of 4.00 (*SD* = 3.56) and a minimum score of 0.00 and a maximum score of 7.00.

Thematic Analysis. For week 1, the overall themes for the phone follow-up sessions among each family were: family, child, and parental effort, healthy screen-time, beverages, and eating, good progression, parental satisfaction, adequate physical activity, and optimism. In week 2, common themes for each family were healthy eating and screen-time, good progression, parental and family effort, parental satisfaction, and adequate physical activity. Hindrances were also noted this week among two of the families, which were either structural or school related (Table 4).

For week 3, the common themes among each family were healthy screen-time, eating, and beverages, as well as family, child, and parental effort. Adequate physical activity, positive change, good progress, positive collaboration, and hindrances in relation to school work, a holiday, and medical issues arose. In week 4, great progress, healthy eating, and adequate physical activity were noted. Unhealthy beverage choice and hindrances in relation to school, medical, weather/nature also were commonalities.

In week 5, the families shared the themes of good progress, lack of physical activity, healthy eating and beverages, sleep progression, accountability, and parental effort. Hindrances due to weather/nature, a school break, and a holiday were also noted. For week 6, common themes of great progress, healthy eating, screen-time, and beverages, as well as changed behavior, parental satisfaction, program satisfaction, parental effort, adequate physical activity, healthy alternatives, and support were noted. Hindrances in relation to a holiday, school, and weather/nature was also identified.

Week 7 revealed families noting good progress, changed behavior, and parental buy-in. There were also instances of unhealthy eating, beverages, and screen-time, as well as a lack in physical therapy, and hindrances through a holiday and school. For the last week of the program, week 8, great progress, changed behavior, adaptation, program feasibility, program recommendation, good/beneficial program structure and guidance, accountability, good implementation, optimism, positive outcome, program efficacy, better coping, confidence, promotion of healthy change, future planning/goal, and appropriate timeframe/timeframe matters were all represented.

Healthy Habits. After individual comparison, the data from each participants' pre- and post-questionnaire was collectively assessed to note any relationship among the group. This is depicted in Table 5.

Four participants noted that they had a change in regard to the amount of fruit or vegetables consumed in a day, as well as in the amount of time each day being active. Three participants indicated that there was a change in the amount of daily recreational screen-time, and two participants indicated that there was a change in the weekly amount of time he/she ate

dinner at the table with family. One participant noted a change in the amount of time slept each night, and in the consumptive number of 8-oz servings of soda and/or punch daily.

There were also two participants who noted a change in behavior in regard to television and/or internet-connected device being in their room. This change was an inverse change in behavior, as at post-program there was a television and/or internet connected device in the room that was not there pre-program. Consistency was noted among 7 of the questions asked, in relation to how many times per week he/she ate breakfast; ate takeout or fast-food; consumed 8-oz servings of 100% juice, water, fruits or sports drink, whole milk, and/or nonfat, low-fat, or reduced-fat milk per day.

Discussion

Implementing an evidence-based practice change is an arduous process. Even though the algorithmic structure of the Iowa Model offers an outline to guide the process of implementing such a practice change, individual, structural, and organizational dynamics influence the procedures necessary to prove effectiveness. For each process of this DNP project, such influences are discussed below.

PedsQL™ Data. Statistical power was not established within this project, since there were only 4 participants, and as a result, inferential statistics were not conducted. With a lack of statistical significance to depend on, evidence within the descriptive statistics was relied heavily on to demonstrate program efficacy and positive changes.

For the parent physical scores, there was minimal change to the post and pre data collected, as the mean post-score is 77.25 and the pre-score is 69.56, on a scale of 0 to 100 with 100 indicating better quality of life. This is an overall difference of 7.65, which is a positive change, although a small one. Though small, the parents noted a positive change in their child’s

physical status and physical ability from pre-intervention to post-intervention. The child physical scores revealed an inverse/negative change, due to the post-score being 81.75 and the pre-score being 81.93. This results in a difference of -0.18, which indicates little to no change in the physical component based on the child report.

The psychosocial component (emotional, social, and school functioning) for the parents noted a positive change from the pre-intervention to post-intervention data, as the post-score is 76.25 and the pre-score is 62.08, on a scale of 0 to 100 with 100 indicating better quality of life. This creates a difference of 14.17, which indicates a positive change in the child's psychosocial health from the start of the program to its completion. There was a positive change reported in the child psychosocial report, although smaller than the parent report. The post-score for the child psychosocial component is 79.00 and pre-score of 73.33, a difference of 5.67.

The total parent report scoring, which is the summation of the physical and psychosocial components, also notes a positive overall change, as the post-score is 76.50 and the pre-score is 64.75, on a scale of 0 to 100 with 100 indicating better quality of life. The difference for this category is 11.75, which illustrates that overall, the parents' perception may have improved. The total child report scoring also notes a positive change overall, although small, in that the post-score is 80.25 and the pre-score is 76.25. The difference post-intervention and pre-intervention for this category is 4.00, which also indicates that the children report a positive difference overall in their health.

In reviewing the descriptive data, a pattern is noticed among each category. Parents reported more positive changes in regard to their child's overall health post-intervention, from the pre-intervention data. However, for each category, the children only noted small changes to

their health. Even though this DNP project was unable to demonstrate any statistical significance due to low enrollment, the reported changes, although minimal, show the clinical relevance.

Thematic Analysis. Week by week for each family, there were positive changes identified throughout the entirety of the program. Examples of some of the themes and changes are represented in Table 4. Despite common themes demonstrated each week among the families, there were instances where one child had a distraction or issue in completing a task for the week, in comparison to the others. However, collectively as a group, they each demonstrated likeness week by week in their motivation for compliance and completion.

At the start of the program, each family expressed motivation and excitement. Families were optimistic and exhibited positive effort. Since this was an adjustment for all, there were instances of unhealthy eating, unhealthy beverage choices, and a lack of physical activity. However, during each week, the DNP student offered suggestions and guidance for each parent, for ways to get the child and family back on track. For example, some parents noted that it was hard to get their child to consume vegetables. The DNP student suggested adding smoothies into the diet, which can incorporate a substantial number of fruits and vegetables into the diet. This suggestion was positive, in that two children began to consume smoothies daily and enjoyed them.

The DNP student also suggested healthy snack choices with each family (apples, carrots, or celery with peanut butter, smoothies, etc.), and ways to achieve the physical activity component. For participants who struggled with physical activity due to school, the DNP student suggested splitting up the times that the child is physically active to 30 minutes each time (30 minutes before school or during their break, and 30 minutes before dinner). Two families

implemented this suggestion with success, while others noted success through adjusting their tasks throughout the day.

As the weeks progressed, changed behavior and healthy habits were forming among each individual, although at different times. Each progressed at separate rates, which is attributed to their personal challenges and noted hindrances. Barriers were identified each week by at least one, and sometimes among many families. These hindrances are categorized as structural, medical, school, holiday, or weather/nature changes. The structural hindrances included a relative within the home offering a non-healthy beverage choice to a child, that was overcome when the parent corrected the behavior, and also a school break which enabled the child to watch more television. However, this parent corrected the behavior as well, and got the child back on track for the program. A school related hindrance occurred with another participant, who was applying to colleges and writing application essays. This academic necessity limited the participant's physical activity at times, but they were able to correct the behavior by doing more indoor activities.

Weather/nature hindrances occurred for multiple families, as rain and snow disrupted their normal routine of getting outdoors for their physical activity. However, although disruptive, most families found activities within the home to complete (hula hoop, walking up and down the stairs, yoga, walking the family dog in the home, etc.). Holiday hindrances also occurred among each family, as the majority participated during November and December. For each family, the child indulged in either a sugary beverage or dessert during the week, causing them to have a theme of unhealthy beverage and eating. A lack of physical activity was also noted during these weeks, as most spent time indoors with their family and friends.

A medical hindrance was noted by one participant, who had their wisdom teeth removed during the program. This caused the participant to have moments where they did not want to do any physical activity and lacked motivation in doing so. However, after 1-2 weeks of healing, the parent increased accountability and guided the child to get back on track with their physical activity. Within two weeks after their procedure, the child was back on track with their physical activity and healthy habits.

Despite the hindrances noted week by week, each participant completed the program with positive outcomes and positive feedback. Each family indicated that this program is feasible and should be adopted within the primary care setting (recommendation). Most noted that the questionnaires were easy to understand and complete. The weekly follow-ups were necessary and beneficial, in that it held the family accountable. Most also indicated that having a third party involved motivated each participant, because they knew that the DNP student was going to be checking in. The program being 8 weeks was an appropriate timeframe, as it caused the actions and new behaviors to "stick," as the actions were repetitive week by week.

Two participants noted that they improved in their sleeping habits, and one stated they no longer dealt with insomnia or sleep disruptions. Physical changes, such as weight loss by one participant, and cessation in headaches by another participant were also noted by the final week One participant also noted that they are able to cope better, as they once dealt with anxiety, and they made a conscious effort to change this during the program. This participant was able to "come out of a dark place" with the help from this program. Three of the participants noted that they are going to continue the changed habits despite completing the program, as one has more confidence and desires to remain healthy in college, and two others plan to add some items to the program and continue on.

One participant noted that the parental involvement and encouragement was an added benefit to this program, and it is very effective for all age ranges. Most added that you have to "put the work in with this program," in order to get the results desired. All were appreciative that they were introduced to the program and that they completed it as a family.

Most of the parents involved indicated initial disbelief that their child could have positive changed behaviors in 8 weeks. However, all noted satisfaction with the program, in that their child has demonstrated those positive behaviors, and they feel better mentally and physically. Overall, each family asserts that this program is feasible and should be implemented into primary care, as most families are too busy to follow-up with referrals to outside programs. They note that having a program "in house" would be more of a benefit to the family, with the consistent follow-up to "keep the family on their toes." One parent noted that even if the primary care practice did not implement this exact program, that something similar needs to be in place, to hold families accountable, and offer them a sense of guidance and structure for their child's health.

Healthy Habits. Despite a lack of psychometrics for the 5-2-1-0 Healthy Habits Questionnaire (HHQ), there was evidence within the data that illustrated positive behavioral changes within the categories, among each participant from the pre- to post-data. In Table 5, each participant increased the number of fruits and vegetables they consumed post-intervention, in comparison to pre-intervention. This led to an overall 100% change among the participants for this category. The number of fruits and vegetables consumed post-intervention was higher than that of the pre-intervention data, which was a positive outcome variable. There was also a 100% positive change among the participants in regard to the amount of physical activity they

conducted post-intervention, compared to pre-intervention. Most of the participants increased the amount of daily physical activity by 30 minutes to 1 hour.

Daily screen-time also improved among 3 of the participants, leading to a 75% overall behavioral change for this category. Most participants decreased their screen-time by 30 minutes or an hour. One participant started with a screen-time of 2 hours and also completed it with 2 hours, therefore, there was consistency. Two participants noted an overall improvement in the amount of time spent weekly eating dinner as a family. One family increased their time spent together by 1 day, and the other noted an increase from 0 to 6 days of eating dinner as a family post-intervention. This led to a 50% behavioral change among the families. The other two families remained consistent.

For one participant, there was improvement in the amount of time slept at night by an approximate 1-hour increase. This led to an overall 25% behavioral change in this category, since the other 3 participant scores remained consistent. Another category with a 25% overall behavioral change was the amount of soda/punch consumed daily. One participant noted that there was occasional consumption of this sugary beverage pre-intervention, but at post-intervention, there was no consumption. Others within this category remained consistent pre- and post- with zero consumption.

There was also no change/consistency from the pre- and post-data with regard to how often the child had breakfast each week and how many times the child will have takeout/fast food. In regard to the number of 8-oz beverages each child had daily, there was no change/consistency among those categories (excluding the soda/punch described above). Each child noted that they consumed an adequate amount of water pre- and post-intervention and none noted consumption of other types of beverages, as asked within the questionnaire.

There were two participants who initially did not have a television and/or an internet connected device in their room pre-intervention, but did post-intervention. Explanations in regard to this change was postulated by the DNP student, in that perhaps the participant who turned 18 years old right at the culmination of the intervention, received a TV as a gift and/or purchased one. And perhaps the other participant received a television and/or an internet connected device in the room, for intention-focused/purposeful screen-time (learning a trade). Reasons can also be made that with the COVID pandemic, parents offered another means of entertainment, due to the mandated state restrictions. Although this was the case, this did not affect any behavior in regard to the amount of television requested per this project guideline.

The use of the HHQ was beneficial to this DNP project, as it reported change behavior, despite the inability to show statistical significance. The direct report from each child or parent demonstrated that with adequate timeframe, parental involvement, and follow-up, behavior change and healthy lifestyle modifications are possible.

Strength and Limitations

Strengths. The project successfully delivered the Let's Go! 5-2-1-0 Childhood Obesity Prevention Program and allowed the participants to see its value. Each family described healthier eating habits and improved recreational time management of screen-time and physical activity. Buy-in of this project among the practice site providers also adds to the strength of this project, in that it fosters and cultivates a sustainable environment for this program post-implementation, creating better outcomes for patients and families. Another significant strength of this program is that it integrates research for the use of family-based interventions within primary care (Riggs et al., 2014; Taylor et al., 2015), and reinforces the recommendations of the American Academy of Pediatrics, thus translating this evidence-based research into clinical

practice. The use of a reliable and validated tool, the PedsQL™, and a validated implementation framework, the Iowa Model, also adds to the value of this project. Also, there was minimal impact in relation to time when families completed these questionnaires, as the time from start to completion ranged from 3 to 16 minutes.

Novel weekly follow-up created opportunities for the DNP student to identify and address any problems from the perspective of the family, through education and counseling. The weekly follow-up also allowed the DNP student to create an environment where the patients and families were able to self-manage their care, based on guidance received, thus fostering sustainability post-program. The implementation of this program was efficacious and had positive outcomes with the 4 enrolled families. Although there was a lack of participation and a high rate of families lost to attrition, the feedback received identifies the need for this or a similar program to be put in place.

Another strength to this project is that it aligned with the eight DNP essentials established by the American Association of Colleges of Nursing (AACN). *The Essentials of Doctoral Education for Advanced Nursing Practice* are eight competency guidelines that offer structure for doctoral nursing programs (AACN, 2006). Throughout the process of this projects' development and implementation, the eight essentials were demonstrated. *Essential I: Scientific Underpinnings for Practice* was demonstrated by utilizing the implementation framework, the Iowa Model, as an algorithmic foundation to translate evidence-based research into clinical practice.

The DNP student demonstrated *Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking* by using advanced communication skills through telecommunication with families weekly, which ensured accountability in the quality of the

healthcare each family received. *Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice* was shown through the critical appraisal of existing literature for family-based interventions within primary care for pediatric overweight and obese patients, as well as other evidence to determine how best to implement this project. The dissemination of the findings to the practice site and journals will also be conducted to improve healthcare outcomes.

Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care was demonstrated through collaboration with the statistician to analyze the data collected. The DNP student implemented *Essential V: Health Care Policy for Advocacy in Health Care* by educating the practice site providers, participants, and their parents on the evidence gathered, project implemented, and results generated. *Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes* was shown by collaborating with the DNP advisor, practice site physicians, statistician, and program staff. *Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health* was demonstrated by using evidence-based practice to transform health behavior, encourage healthier lifestyle changes, and improve quality of life among the pediatric patients. *Essential VIII: Advanced Nursing Practice* was demonstrated by designing, implementing, and evaluating this evidence-based project.

Limitations. The small sample size was a key limitation to this project. Although many families expressed interest in the program initially, most did not complete for various reasons, and some were lost in follow-up, thus opting to receive usual care from their healthcare provider. Even though there were differences in demographics among the participants, with the small sample size, results are not generalizable to a larger population. Another limitation to this project was the usage of the non-validated Healthy Habits Questionnaire (HHQ) and the duration of the

intervention. Although changes in habit formation can occur within 8 weeks, the short implementation timeframe did not allow for a more substantial outcome in regard to healthier behaviors and quality of life. Also, the self-reported results completed by the pediatric population, can also pose a risk in the accuracy of each survey.

Sustainability of the program post-intervention is not only key for the practice site, but also for each family enrolled in the program. Follow-up data 2-3 months post-program should have been incorporated in this project to assess if the behavior changes were still employed, void of weekly follow-up. Lastly, the lack of clinician-patient face to face interaction due to the COVID-19 pandemic also creates a limitation for this project, as there was an absence of personal touch and human interaction that can often be an added element to treatment and care.

Integrate and Sustain the Practice Change

This project demonstrated the potential impact of the implementation of a behavior change program for the pediatric overweight and obese populations in a primary care setting.

Implications for Advanced Practice Nursing

Implementation of a family-based program, such as Let's Go! 5-2-1-0, aimed to improve health behaviors and quality of life can have a significant impact on pediatric patients and families. Pediatric obesity can cause a lifetime of chronic health issues and complications, and nurses, along with advanced practice nurses within primary care can have the greatest impact in its prevention. When gathering the weight and height of a child during their wellness check/yearly physical, the nurse has the ability to bring awareness of any clinical and anthropometric signs of the child being overweight or obese to the healthcare provider. The healthcare provider and clinical staff can then take the appropriate measures to create a plan of care for that patient. After assessment of the family lifestyle and health habits, a family-based

program such as Let's Go! 5-2-1-0 can be initiated, as indicated, and weekly follow-up can be accomplished by an advanced practice nurse.

This program created a standardized process that enables clinicians to screen and follow-up with families, thus facilitating consistency, family involvement, and feedback. This program demonstrated the importance of a family-based approach, ways to improve patient health outcomes, and ways to increase provider-patient engagement and collaboration. This project demonstrated that implementation of such a program is beneficial in a primary care setting, and its use can reinforce the recommendations of the American Academy of Pediatrics. The implementation of this DNP project reinforces to the growing body of literature for usual care versus family-based care, as the practice site will be able to track the progress of families who did not enroll or were lost due to attrition, versus those who completed the program. By identifying overweight or obese children and adolescents, quality of life and health outcomes can greatly improve with appropriate and timely identification.

Sustainability

Implementing and maintaining a family-based healthy lifestyle program within primary care has the potential to greatly improve health behaviors and quality of life for the pediatric patient. The time to complete the pre- and post-questionnaires that assess the current habits and quality of life of the patient is minimal and the program itself requires very few resources. By designating one to two advanced practice nurses within the practice, the practice site will be able to sustain this program, and can find ways to modify it to meet the need and demand of the staff and individual family. Success of the program will rely heavily on identifying the role of each advance practice nurse, delegating how and when each family will complete the pre- and post-

questionnaires, how advance practice nurses will conduct weekly phone follow-up with the patient/family, and how they will incorporate the feedback from each family to evolve their care.

Additional recommendations for sustainability include having a coordinator from the Let's Go! 5-2-1-0 program come to the practice site, where more information and education can be given about the program. Coordinators of the program offer site visits, to assist primary care providers in their effort to reduce the impact of obesity among the pediatric population. During the provider meetings at the practice site, providers can discuss any changes that are needed to the program, and a program refresher course can be conducted and program success could be shared every three months among the nurses and providers to reinforce the goals of the program.

Disseminate the Results

Information on the program, project procedures, project findings, and recommendations were presented to the practice site for future use. As part of the requirements for completion of the Doctor of Nursing Practice program, a report of this project will be submitted to the University of Virginia School of Nursing, as well as submission to the University's repository, Libra. A manuscript will be submitted to the *Journal of Pediatric Obesity* or the *Journal of Nurse Practitioners* for publication.

Conclusion

Childhood obesity is a significant problem that affects not only the child or adolescent, but can also have an impact on the family. If untreated, obesity can be detrimental to the quality of life of the child or adolescent through adulthood. Though evidence exists noting primary care providers as most influential in addressing pediatric obesity, some acknowledge that they do not have a program in place to address this growing epidemic. This evidence-based project illustrated the efficacy of implementing a family-based program in the primary care setting. By

utilizing questionnaires to assess quality of life and health habits, and novel weekly follow-up, primary care providers can support the patient and family's self-management. The delivery of health modification opportunities through a family-based intervention within primary care can contribute to healthier outcomes for the pediatric population, and diminish the impact of this epidemic.

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Table 1.

Accepted Studies on Family-based Interventions for Pediatric Obesity

Reference	Study Design/Study Purpose	Sample (and N)	Study Outcomes	Level of Evidence
Croker et al., 2012	Randomized Controlled Trial. To examine the acceptability and effectiveness of family-based behavioural treatment for childhood obesity in an ethnically and socially diverse sample of families.	Randomized (72)	Treatment group showed a significant reduction in BP and improvement in overall QOL and eating attitudes versus the control group.	I, B
Knowlden & Conrad, 2018	Randomized Controlled Trial. To evaluate a web-based maternal-facilitated childhood obesity prevention intervention for its capacity to elicit sustained effects..	Randomized (57)	Parent involvement showed significant improvement in regard to child fruit and vegetable behaviors. Both groups showed improvement in child physical activity, sugar-free beverage intake, as well as screen time.	I, B
Riggs et al., 2014	Quasi-Experimental (Mixed Methods). To assess the feasibility and acceptability of family-based group	Convenience (38)	Quantitative: Noted improvement in parent-reported child QOL, decrease/change in mean BMI for both child and parent. Qualitative: parents reported receiving a wide range of support for healthy lifestyle changes	II, B

	pediatric obesity treatment in a primary care setting, to obtain an estimate of its effectiveness, and to describe participating parents' experiences of social support for healthy lifestyle changes			
Steele et al., 2011	Randomized Controlled Trial. To examine the effectiveness of a family-based intervention group for pediatric obesity relative to a brief family intervention among treatment seeking children and adolescents.	Randomized (93)	Both groups experienced a reduction in BMIz at post-intervention and follow-up, and there was an increase in child and parent reported QOL post-intervention and follow-up (PF>BFI)	I, B
Taylor et al., 2015	Randomized controlled trial. To determine if family-based intervention with frequent contact and limited expert involvement improved BMI scores, versus usual care.	Randomized (206)	BMI, BMI z, and waist circumference scores were significantly lower in the tailored package intervention group. It was also noted that children within the tailored packaged group consumed more fruits and veggies (p-value 0.038), ate fewer noncore foods (p-value 0.020), and were more physically active (p-value 0.035) in comparison to those in the usual care group.	I, B
Theim et al., 2013	Randomized Controlled Trial.	Randomized (110)	Higher attendance was linked to better child weight outcomes post therapy, but not at the 2 year follow-up, and adherence	I, B

	To assess the effectiveness of a family based intervention (either behavior focused or socially focused) on adherence to obesity treatment regimens		also created better child weight outcomes at follow-up among the behavioral intervention group.	

Table 2.

Weekly Follow-up Questions

Week	Questions
Week 1 Week 2	"How did you incorporate the 5 fruits and vegetables recommended daily into the diet?" "Did you find any difficulty or challenges in doing so?" "What did you and the child like or dislike about the program this week?"
Week 3 Week 4	"Was the child able to adhere to the maximum 2 hours of daily screen-time" "How did you implement it?" "Did you find any difficulty or challenges in doing so?" "What did you and the child like or dislike about the program this week?"
Week 5 Week 6	"What did you and the child do for daily physical activity?" "Was it for an hour?" "Did you find any difficulty or challenges in doing so?" "What did you and the child like or dislike about the program this week?"
Week 7 Week 8	"Was the child able to adhere to zero sugary beverages in the diet?" "What was supplemented in its place?" "Did you find any difficulty or challenges in doing so?" "What did you and the child like or dislike about the program this week?" Additional Questions for the 8th Week: "Was this program beneficial or helpful to the you and the child?" "Is this something that you would recommend to your child's healthcare provider?"

Table 3.

Descriptive Statistics of the Pre and Post PedsQL™ data; n=4

	Pre			Post			Difference	
	Mean (*SD*)	**Min-Max**		**Mean (*SD*)**	**Min-Max**		**Mean (*SD*)**	**Min-Max**
Parent Physical Score	69.59 (25.46)	40.63 - 93.75		77.25 (18.57)	50.00-90.00		7.65 (13.10)	-5.75-25.00
Child Physical Score	81.93 (9.30)	71.88-93.75		81.75 (2.87)	78.00-84.00		-0.18 (9.14)	-9.75-12.12
Parent Psychosocial Score	62.08 (14.03)	46.67-78.33		76.25 (12.60)	68.00-95.00		14.17 (7.49)	3.67-21.33
Child Psychosocial Score	73.33 (8.49)	65.00-85.00		79.00 (6.68)	70.00-85.00		5.67 (7.01)	-2.00-15.00
Total Parent Score	64.75 (17.63)	45.00-82.00		76.50 (12.76)	62.00-93.00		11.75 (8.54)	0.00-19.00
Total Child Score	76.25 (4.64)	72.00-82.00		80.25 (4.64)	74.00-85.00		4.00 (3.56)	0.00-7.00

Note. SD = Standard Deviation;

Parent Physical Score = Parent-proxy report of child's physical status;

Child Physical Score = Child report of their physical status;

Parent Psychosocial Score = Parent-proxy report of child's emotional, social, and school functioning status;

Child Psychosocial Score = Child report of their emotional, social, and school functioning;

Total Parent Score = Summation of parent-proxy physical and psychosocial report;

Total Child Score = Summation of child's physical and psychosocial report.

Table 4.

Weekly Follow-up Thematic Analysis

Week	Theme	Example
1	Healthy Eating	Eating 5 servings of fruits or vegetables daily
	Family Effort	Family has the 4 sheets of the 5-2-1-0 program posted up on the house for them to view daily
	Parental Satisfaction	Child has been self-regulating everything and the parent is happy with the noted changes; Parent is already noticing an increase in the child's confidence and positive changes
	Optimism	Parent is very excited for what's to come, as the program so far is going pretty well and is easy.
2	Structural Hindrance	Family member in the home offering the child sugary beverages
	School Hindrance	Finding time to be physically active due to applying for college and schoolwork
	Parental Satisfaction	Habits are changing, as the child did not put up a "fit" when not able to receive sugary beverage
	Good Progression	Keeping screen-time to 2 hours, doing 1 hour of physical activity by riding bike
3	Positive Change	Still eating well and has not asked for any sodas or sugary beverages; parent sees that the child is really motivated to eat healthy and exercise more
	Positive Collaboration	Participant enjoys and looks forward to weekly follow-up phone calls with DNP student
	Medical Hindrance	Participant had wisdom teeth removed, thus slowly progress of the program for this week
	Holiday Hindrance	Had a sugary beverage due to celebrating the holiday with family
4	Great Progress	Self-regulating time spent watching television
	Unhealthy Beverage	Had soda this week
	Weather/Nature Hindrance	Running out of sunlight after school, so that the child can be active outside
	School Hindrance	Focusing on school and applying to colleges has been a challenge for this participant to be PA
5	Structural Hindrance	On school break, so the child had more screen-time than requested
	Weather/Natural Hindrance	A few days of rain hindered the participant from being PA outside, but was able to do yoga indoors
	Sleep Progression	Being PA has helped with improving sleep habits
	Lack of PA	Minimal PA this week so far by a participant
	Accountability	Child has not been as PA during this week, but the parent will have her do routines in the home
6	Changed Behavior	Child not interested in watching TV, but in being PA; Child not asking for sugary beverages at this point
	Parental Satisfaction	Parent happy with changes; Participant is eating more fruits and vegetables and the parent is pleased
	Healthy Alternative	Drinking a smoothie filled with various fruits and spinach
	Support	Two families received healthy suggestions for PA and snacks by the DNP student

7	Changed Behavior Parental Buy-In	Child not asking for any sweets at this point; Child is self-monitoring activities and self-regulating well Child has a mental checklist now of things that need to be accomplished for the program, parent is amazed and desires to continue the program even after the 8 weeks.
8	Adaptation Program Feasibility Program Recommendation Positive Outcome Program Efficacy Good Structure Appropriate Timeframe Confidence	Participants are strictly self-regulating at this time, without parental input or assistance. Program is feasible for a primary care setting Parents recommend this program, or something like it within primary care, as it is more tangible than referral Program has helped participant(s) sleep better at night. One is no longer anxious or has frequent headaches as before. Program is very effective and helpful, as it makes you think on what you are doing. Check-ins are helpful and easy. Surveys were easy to understand. The program helps you learn what to do and how to change habits. Also, having a 3rd party check-in motivates the children/participants. 8 weeks was an appropriate timeframe for things to "stick." If the time was shorter, families would not have great outcomes. Participant notes that he is now more confident in himself and his ability to become healthy

Note. Structural Hindrance = Disruption to the structure of the program;

Weather/Nature Hindrance = Inclement weather and/or daylight savings changes;

School Hindrance = Disruption of program normal routine due to school related work

Medical Hindrance = Disruption of program processes due to a medical or surgical procedure.

PA = Physically active

Table 5.

Healthy Habits Questionnaire for Pre- and Post-Data

Question	Total Changes in Behavior (n=4)	Percentage
How many servings of fruits or vegetables does your child have a day? (One serving is most easily identified by the size of the palm of your hand)	+4	100%
How many times a week does your child eat dinner at the table together with the family?	+2	50%
How many times a week does your child eat breakfast?	Consistent	0%
How many times a week does your child eat takeout or fast food?	Consistent	0%
How much recreational (outside of school work) screen time does your child have daily?	+3	75%
Is there a television set or Internet-connected device in your child's bedroom?	-2	50%
How many hours does your child sleep each night?	+1	25%
How much time a day does your child spend being active? (faster breathing/heart rate or sweating)?	+4	100%
How many 8-oz servings of 100% juice does your child drink a day?	Consistent	0%
How many 8-oz servings of water does your child drink a day?	Consistent	0%
How many 8-oz servings of fruit or sports drinks does your child drink a day?	Consistent	0%
How many 8-oz servings of whole milk does your child drink a day?	Consistent	0%
How many 8-oz servings of soda or punch does your child drink a day?	+1	25%
How many 8-oz servings of nonfat (skim), low-fat (1%), or reduced-fat (2%) milk does your child drink a day?	Consistent	0%

Note: + = Desired habit change

- = Undesired habit change

Consistent = No change in pre to post data

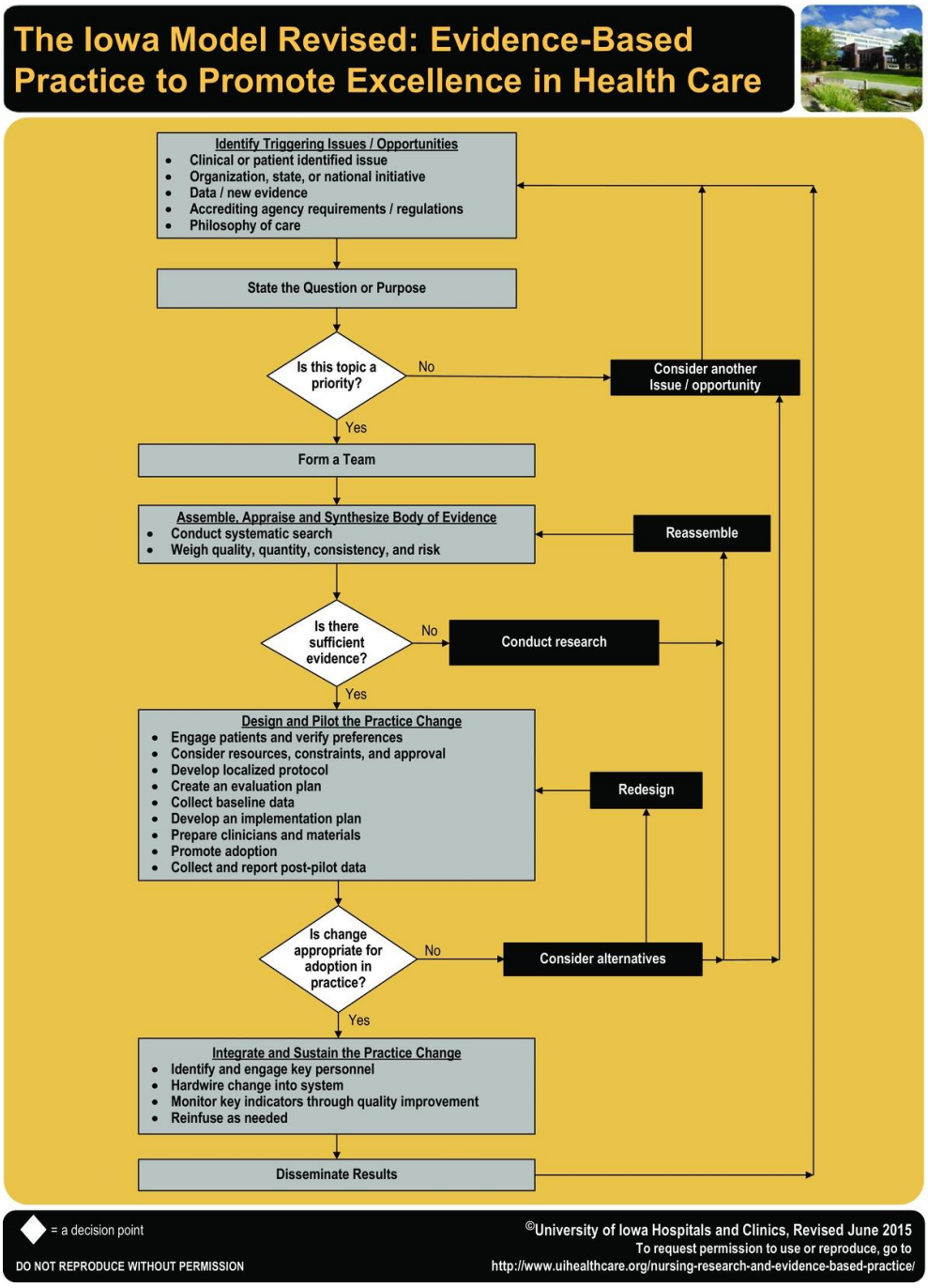


Figure 1. The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care. Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing*, *14*(3), 175-182. doi:10.1111/wvn.12223. Reprinted with permission.

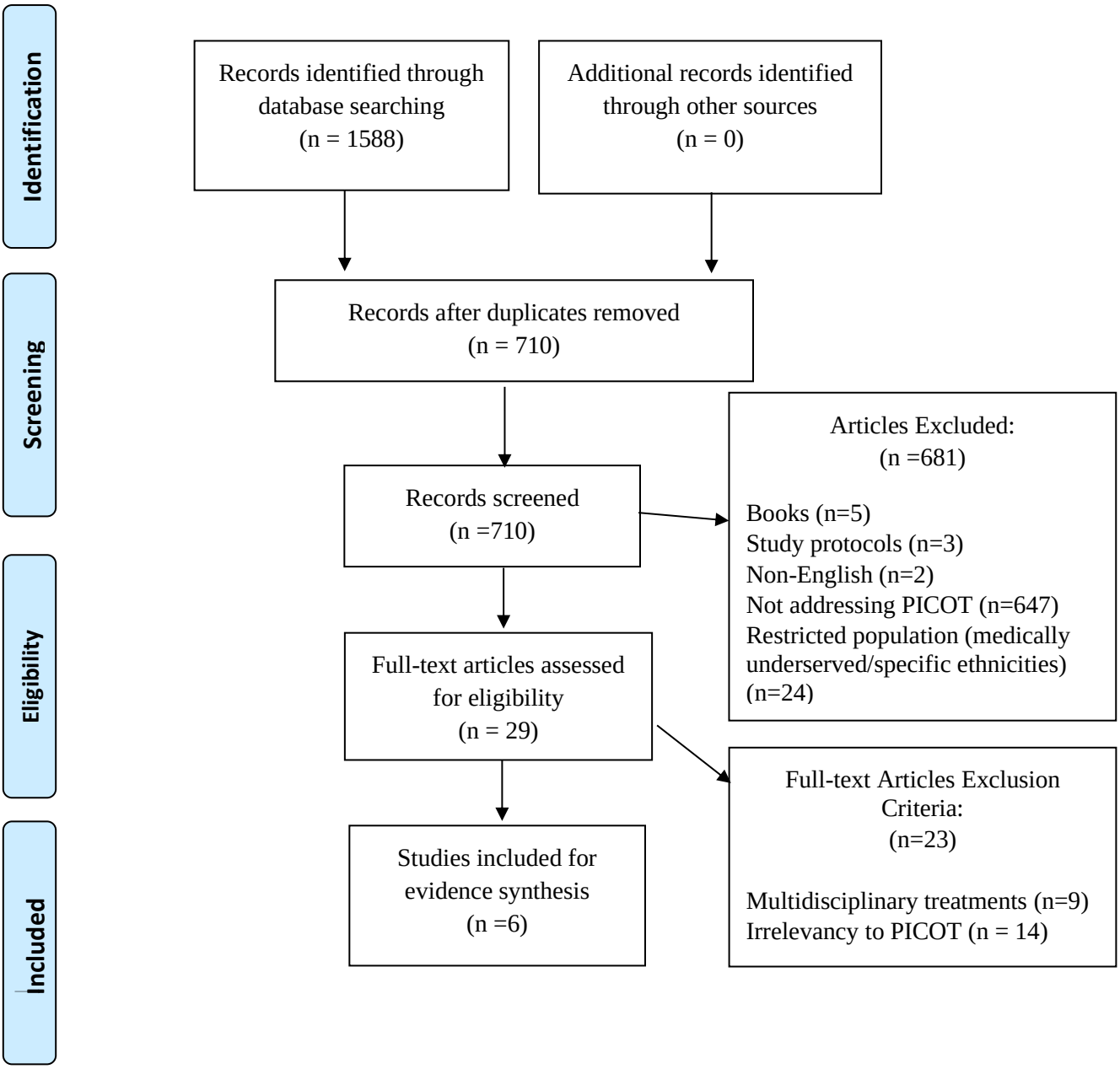


Figure 2. PRISMA flow diagram for database searches: PubMed, Web of Science, CINAHL, and Ovid Medline.

Johns Hopkins Nursing Evidence-Based Practice

Appendix D

Evidence Level and Quality Guide

Evidence Levels	Quality Ratings
Level I Experimental study, randomized controlled trial (RCT) Explanatory mixed method design that includes only a level I quaNtitative study Systematic review of RCTs, with or without meta-analysis	**QuaNtitative Studies** **A** **High quality**: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence. **B** **Good quality**: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence. **C** **Low quality or major flaws**: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn.
Level II Quasi-experimental study Explanatory mixed method design that includes only a level II quaNtitative study Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis	**QuaLitative Studies** No commonly agreed-on principles exist for judging the quality of quaLitative studies. It is a subjective process based on the extent to which study data contributes to synthesis and how much information is known about the researchers' efforts to meet the appraisal criteria. *For meta-synthesis, there is preliminary agreement that quality assessments of individual studies should be made before synthesis to screen out poor-quality studies*[1]. **A/B** **High/Good quality** is used for single studies and meta-syntheses[2]. The report discusses efforts to enhance or evaluate the quality of the data and the overall inquiry in sufficient detail; and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all of the following is found in the report: • Transparency: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated. • Diligence: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence. • Verification: The process of checking, confirming, and ensuring methodologic coherence. • Self-reflection and scrutiny: Being continuously aware of how a researcher's experiences, background, or prejudices might shape and bias analysis and interpretations. • Participant-driven inquiry: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated. • Insightful interpretation: Data and knowledge are linked in meaningful ways to relevant literature. **C** **Low quality** studies contribute little to the overall review of findings and have few, if any, of the features listed for high/good quality.
Level III Nonexperimental study Systematic review of a combination of RCTs, quasi-experimental and nonexperimental studies, or nonexperimental studies only, with or without meta-analysis Exploratory, convergent, or multiphasic mixed methods studies Explanatory mixed method design that includes only a level III quaNtitative study QuaLitative study Meta-synthesis	

Figure 3.1 John Hopkins Nursing Evidence-Based Practice: Evidence Level and Quality Guide, Levels I-III. Dang, D., & Dearholt, S. (2017). *Johns Hopkins nursing evidence-based practice: model and guidelines.* 3rd ed. Indianapolis, IN: Sigma Theta Tau International. Reprinted with permission.

Johns Hopkins Nursing Evidence-Based Practice

Appendix D

Evidence Level and Quality Guide

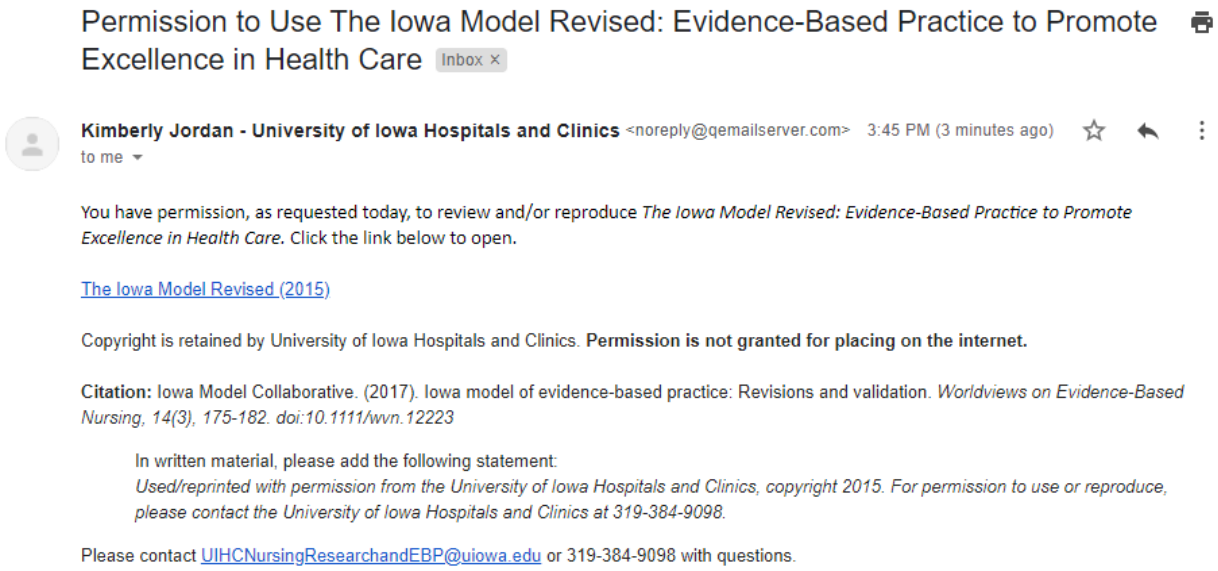
Evidence Levels	Quality Ratings
Level IV Opinion of respected authorities and/or nationally recognized expert committees or consensus panels based on scientific evidence Includes: • Clinical practice guidelines • Consensus panels/position statements	**A High quality:** Material officially sponsored by a professional, public, or private organization or a government agency; documentation of a systematic literature search strategy; consistent results with sufficient numbers of well-designed studies; criteria-based evaluation of overall scientific strength and quality of included studies and definitive conclusions; national expertise clearly evident; developed or revised within the past five years **B Good quality:** Material officially sponsored by a professional, public, or private organization or a government agency; reasonably thorough and appropriate systematic literature search strategy; reasonably consistent results, sufficient numbers of well-designed studies; evaluation of strengths and limitations of included studies with fairly definitive conclusions; national expertise clearly evident; developed or revised within the past five years **C Low quality or major flaws:** Material not sponsored by an official organization or agency; undefined, poorly defined, or limited literature search strategy; no evaluation of strengths and limitations of included studies, insufficient evidence with inconsistent results, conclusions cannot be drawn; not revised within the past five years
Level V Based on experiential and nonresearch evidence Includes: • Integrative reviews • Literature reviews • Quality improvement, program, or financial evaluation • Case reports • Opinion of nationally recognized expert(s) based on experiential evidence	**Organizational Experience (quality improvement, program or financial evaluation)** **A High quality**: Clear aims and objectives; consistent results across multiple settings; formal quality improvement, financial, or program evaluation methods used; definitive conclusions; consistent recommendations with thorough reference to scientific evidence **B Good quality**: Clear aims and objectives; consistent results in a single setting; formal quality improvement, financial, or program evaluation methods used; reasonably consistent recommendations with some reference to scientific evidence **C Low quality or major flaws**: Unclear or missing aims and objectives; inconsistent results; poorly defined quality improvement, financial, or program evaluation methods; recommendations cannot be made **Integrative Review, Literature Review, Expert Opinion, Case Report, Community Standard, Clinician Experience, Consumer Preference** **A High quality**: Expertise is clearly evident; draws definitive conclusions; provides scientific rationale; thought leader(s) in the field **B Good quality**: Expertise appears to be credible; draws fairly definitive conclusions; provides logical argument for opinions **C Low quality or major flaws**: Expertise is not discernable or is dubious; conclusions cannot be drawn

1 https://www.york.ac.uk/crd/SysRev/!SSL!/WebHelp/8_4_ASSESSMENT_OF_QUALITATIVE_RESEARCH.htm
2 Adapted from Polit & Beck (2017).

Figure 3.2 John Hopkins Nursing Evidence-Based Practice: Evidence Level and Quality Guide, Levels IV&V. Dang, D., & Dearholt, S. (2017). *Johns Hopkins nursing evidence-based practice: model and guidelines.* 3rd ed. Indianapolis, IN: Sigma Theta Tau International. Reprinted with permission.

Appendix A

Permission to use the Iowa Model Revised



Permission to Use The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care Inbox ×

Kimberly Jordan - University of Iowa Hospitals and Clinics <noreply@qemailserver.com> 3:45 PM (3 minutes ago)
to me

You have permission, as requested today, to review and/or reproduce *The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care.* Click the link below to open.

The Iowa Model Revised (2015)

Copyright is retained by University of Iowa Hospitals and Clinics. **Permission is not granted for placing on the internet.**

Citation: Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14(3), 175-182. doi:10.1111/wvn.12223*

In written material, please add the following statement:
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Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

Appendix B

Permission to use the John Hopkins Nursing Evidence-Based Practice Appraisal (JHNEBP) Tool

JHNEBP MODEL AND TOOLS- PERMISSION

Johns Hopkins Nursing
Center for Evidence-Based Practice

Thank you for your submission. We are happy to give you permission to use the JHNEBP model and tools in adherence of our legal terms noted below:

- You may not modify the model or the tools without written approval from Johns Hopkins.
- All reference to source forms should include "©The Johns Hopkins Hospital/The Johns Hopkins University."
- The tools may not be used for commercial purposes without special permission.

If interested in commercial use or discussing changes to the tool, please email ijhn@jhmi.edu.

Downloads:

JHNEBP Tools-Printable Version

JHNEBP Tools-Electronic Version

Do you prefer hands-on learning?

Appendix C

Site Permission

Gretchen Brantley, MD
Piedmont Pediatrics
900 Rio E Ct A
Charlottesville, VA 22901

June 24, 2020

Tiah Cooke
Doctor of Nursing Practice Student
University of Virginia School of Nursing
225 Jeanette Lancaster Way
Charlottesville, VA 22903

Dear Tiah Cooke:

This letter grants you permission to implement your Doctor of Nursing Practice scholarly project, "Application of a Feasible Family-Based Program for Pediatric Obesity in the Primary Care Setting," at Piedmont Pediatrics during the fall of 2020.

Sincerely,

gretchen brantley

Gretchen Brantley, MD

Appendix D

IRB Permission post-completion of the Determination of Human Subjects Research Form

FOR IRB-HSR OFFICE USE ONLY

UVA IRB-HSR Study Tracking # 22568

☒ **Project is determined to NOT meet the criteria of Research with Human Subjects or a Clinical Investigation and therefore is not subject to IRB-HSR Review.**

All project team personnel are required to follow all requirements described in this form and follow:

- *Procurement requirements if participants will be compensated for their time*
- *UVA Information Security policies to protect the data: See Appendix B: Privacy Plan.*
-

Pick One

☐ No health information/specimens are to be collected or used for this project

☐ Health information/specimens to be collected or used for this project meet the criteria of Deidentified under HIPAA (No identifiers as noted in Appendix A may be collected/ used.)

☒ Health information collected meets the criteria of identifiable

☐ Health Information meets the criteria of Limited Dataset.
HIPAA Data Use Agreement is required to share data outside of UVA.

☐ Data/Specimens used in this project are coded:

Check if applicable

☒ Your project was determined to be QI-Improvement Project. If you decide to publish results of this project you must describe the project in the publication as QI and NOT as human subject research.

IF SENDING OR RECEIVING DATA/SPECIMENS

☐ Provide this signed form to School of Medicine Office of Grants and Contracts and/or Medical Center Procurement if your project has external funding or plans to share data/specimens outside of UVA.

Contact the IRB if anything concerning this project changes that might affect the non-human subject determination.

☐ **Project is determined to be Human Subjects Research or a Clinical Investigation** and must be submitted to the IRB-HSR for review and approval prior to implementation. Please go the Protocol Builder to create your submission. https://www.irb.virginia.edu/

Name of IRB Staff: Karen Mills | ***Date:*** 08-10-20

Appendix E

Parent-proxy Report Format

PedsQL 2

*In the past **ONE month,** how much of a **problem** has your child had with …*

PHYSICAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Walking more than one block	0	1	2	3	4
2. Running	0	1	2	3	4
3. Participating in sports activity or exercise	0	1	2	3	4
4. Lifting something heavy	0	1	2	3	4
5. Taking a bath or shower by him or herself	0	1	2	3	4
6. Doing chores around the house	0	1	2	3	4
7. Having hurts or aches	0	1	2	3	4
8. Low energy level	0	1	2	3	4

EMOTIONAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Feeling afraid or scared	0	1	2	3	4
2. Feeling sad or blue	0	1	2	3	4
3. Feeling angry	0	1	2	3	4
4. Trouble sleeping	0	1	2	3	4
5. Worrying about what will happen to him or her	0	1	2	3	4

SOCIAL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Getting along with other children	0	1	2	3	4
2. Other kids not wanting to be his or her friend	0	1	2	3	4
3. Getting teased by other children	0	1	2	3	4
4. Not able to do things that other children his or her age can do	0	1	2	3	4
5. Keeping up when playing with other children	0	1	2	3	4

SCHOOL FUNCTIONING *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. Paying attention in class	0	1	2	3	4
2. Forgetting things	0	1	2	3	4
3. Keeping up with schoolwork	0	1	2	3	4
4. Missing school because of not feeling well	0	1	2	3	4
5. Missing school to go to the doctor or hospital	0	1	2	3	4

Appendix F

Child Report Format

PedsQL 2

*In the past **ONE month**, how much of a **problem** has this been for you …*

ABOUT MY HEALTH AND ACTIVITIES *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. It is hard for me to walk more than one block	0	1	2	3	4
2. It is hard for me to run	0	1	2	3	4
3. It is hard for me to do sports activity or exercise	0	1	2	3	4
4. It is hard for me to lift something heavy	0	1	2	3	4
5. It is hard for me to take a bath or shower by myself	0	1	2	3	4
6. It is hard for me to do chores around the house	0	1	2	3	4
7. I hurt or ache	0	1	2	3	4
8. I have low energy	0	1	2	3	4

ABOUT MY FEELINGS *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. I feel afraid or scared	0	1	2	3	4
2. I feel sad or blue	0	1	2	3	4
3. I feel angry	0	1	2	3	4
4. I have trouble sleeping	0	1	2	3	4
5. I worry about what will happen to me	0	1	2	3	4

HOW I GET ALONG WITH OTHERS *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. I have trouble getting along with other kids	0	1	2	3	4
2. Other kids do not want to be my friend	0	1	2	3	4
3. Other kids tease me	0	1	2	3	4
4. I cannot do things that other kids my age can do	0	1	2	3	4
5. It is hard to keep up when I play with other kids	0	1	2	3	4

ABOUT SCHOOL *(problems with…)*	Never	Almost Never	Some-times	Often	Almost Always
1. It is hard to pay attention in class	0	1	2	3	4
2. I forget things	0	1	2	3	4
3. I have trouble keeping up with my schoolwork	0	1	2	3	4
4. I miss school because of not feeling well	0	1	2	3	4
5. I miss school to go to the doctor or hospital	0	1	2	3	4

Appendix G

Permission to use The Pediatric QOL Measuring Tool

Varni, James Walter <jvarni@arch.tamu.edu> Wed, Jun 10, 5:25 PM (19 hours ago)
to me

Tiah,

If you completed the license agreement, you are all set to go.

Good luck on your study!

James W. Varni, Ph.D.
Professor Emeritus
Department of Pediatrics, College of Medicine
Department of Landscape Architecture and Urban Planning
College of Architecture
Texas A&M University
3137 TAMU
College Station, Texas 77843-3137
jvarni@tamu.edu

Mapi Research Trust

SPECIAL TERMS

These User License Agreement Special Terms ("Special Terms") are issued between Mapi Research Trust ("MRT") and Tiah Cooke ("User").

These Special Terms are in addition to any and all previous Special Terms under the User License Agreement General Terms.

These Special Terms include the terms and conditions of the User License Agreement General Terms, which are hereby incorporated by this reference as though the same was set forth in its entirety and shall be effective as of the Special Terms Effective Date set forth herein.

All capitalized terms which are not defined herein shall have the same meanings as set forth in the User License Agreement General Terms.

These Special Terms, including all attachments and the User License Agreement General Terms contain the entire understanding of the Parties with respect to the subject matter herein and supersedes all previous agreements and undertakings with respect thereto. If the terms and conditions of these Special Terms or any attachment conflict with the terms and conditions of the User License Agreement General Terms, the terms and conditions of the User License Agreement General Terms will control, unless these Special Terms specifically acknowledge the conflict and expressly states that the conflicting term or provision found in these Special Terms control for these Special Terms only. These Special Terms may be modified only by written agreement signed by the Parties.

Mapi Research Trust

Name of the COA	PedsQL™ - Pediatric Quality of Life Inventory™
Author	Varni JW
Copyright Holder	Varni James W, PhD
Copyright notice	Copyright © 1998 JW Varni, Ph.D. All rights reserved
Bibliographic reference	List of references for each PedsQL™ module
Modules/versions needed	PedsQL™ Generic Core Scales

Appendix H

5-2-1-0 Healthy Habits Questionnaire (ages 2-9)

We are interested in the health and well-being of all our patients. Please take a moment to answer these questions.

MaineHealth
LET'S GO!
5-2-1-0

5210 Healthy Habits Questionnaire ages 2-9

Child's Name: _____

Age: _____ Today's Date: _____

1. How many servings of fruits or vegetables do you have a day? _____
One serving is most easily identified by the size of the palm of your hand.

2. How many times a week does your child eat dinner at the table together with the family? _____

3. How many times a week does your child eat breakfast? _____

4. How many times a week does your child eat takeout or fast food? _____

5. How much recreational (outside of school work) screen time does your child have daily? _____

6. Is there a television set or Internet-connected device in your child's bedroom? _____

7. How many hours does your child sleep each night? _____

8. How much time a day does your child spend being active? _____
(faster breathing/heart rate or sweating)?

9. How many 8-ounce servings of the following does your child drink a day?

100% juice _____ Whole milk _____

Water _____ Soda or punch _____

Fruit or sports drinks _____ Nonfat (skim), low-fat (1%), or reduced-fat (2%) milk _____

10. Based on your answers, is there ONE thing you would like to help your child change now? Please check one box.

- ☐ Eat more fruits and vegetables.
- ☐ Eat less fast food/takeout.
- ☐ Drink less soda, juice, or punch.
- ☐ Drink more water.
- ☐ Spend less time watching TV/movies and playing video/computer games.
- ☐ Take the TV out of the bedroom.
- ☐ Be more active – get more exercise.
- ☐ Get more sleep.

Please give the completed form to your clinician. thank you!

40

Appendix I

5-2-1-0 Healthy Habits Questionnaire (ages 10+)

We are interested in the health and well-being of all our patients. Please take a moment to answer these questions.

MaineHealth
LET'S GO!
5-2-1-0

5210 Healthy Habits Questionnaire ages 10+

Your Name: _____

Age: _____ Today's Date: _____

1. How many servings of fruits or vegetables do you have a day? _____
   One serving is most easily identified by the size of the palm of your hand.
2. How many times a week do you eat dinner at the table together with your family? _____
3. How many times a week do you eat breakfast? _____
4. How many times a week do you eat takeout or fast food? _____
5. How much recreational (*outside of school work*) screen time do you have daily? _____
6. Is there a television set or Internet-connected device in your bedroom? _____
7. How many hours do you sleep each night? _____
8. How much time a day do you spend being active? _____
   (faster breathing/heart rate or sweating)?
9. How many 8-ounce servings of the following do you drink a day?

   100% juice _____ Whole milk _____

   Water _____ Soda or punch _____

   Fruit or sports drinks _____ Nonfat (skim), low-fat (1%), or reduced-fat (2%) milk _____

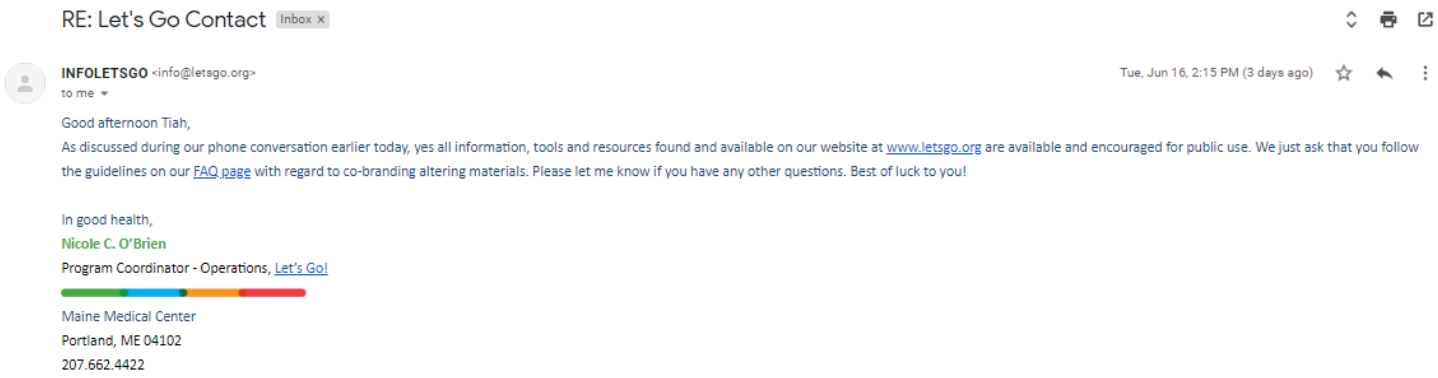
10. Based on your answers, is there ONE thing you would be interested in changing now? Please check one box.
    - ☐ Eat more fruits and vegetables.
    - ☐ Eat less fast food/takeout.
    - ☐ Drink less soda, juice, or punch.
    - ☐ Drink more water.
    - ☐ Spend less time watching TV/movies and playing video/computer games.
    - ☐ Take the TV out of the bedroom.
    - ☐ Be more active – get more exercise.
    - ☐ Get more sleep.

Please give the completed form to your clinician. **thank you!**

41

Appendix J

Permission to use the 5-2-1-0 *Let's Go!* Healthy Lifestyle Program and Tools



RE: Let's Go Contact Inbox ×

INFOLETSGO <info@letsgo.org> Tue, Jun 16, 2:15 PM (3 days ago)
to me

Good afternoon Tiah,
As discussed during our phone conversation earlier today, yes all information, tools and resources found and available on our website at www.letsgo.org are available and encouraged for public use. We just ask that you follow the guidelines on our FAQ page with regard to co-branding altering materials. Please let me know if you have any other questions. Best of luck to you!

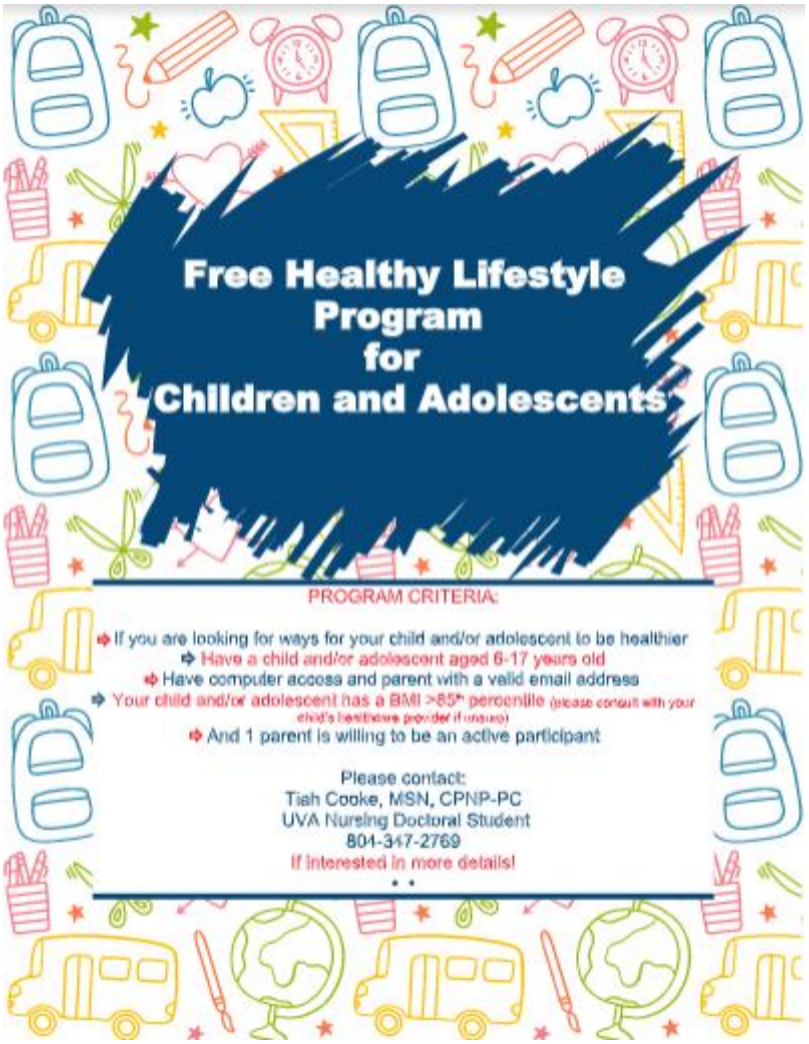
In good health,
Nicole C. O'Brien
Program Coordinator - Operations, Let's Go!
Maine Medical Center
Portland, ME 04102
207.662.4422

Appendix K

Management and Treatment of Overweight or Obese Patients

Appendix L

Program Recruitment Flyer



Appendix M

Permission to use the PedsQL™ through Qualtrics

Varni, James Walter <jvarni@arch.tamu.edu> Thu, Oct 1, 2020, 9:57 AM
to me

You have permission to distribute the PedsQL™ through Qualtrics for the purposes of your study cited below.

•••

James W. Varni, Ph.D.
Professor Emeritus
Department of Pediatrics, College of Medicine
Department of Landscape Architecture and Urban Planning
College of Architecture
Texas A&M University
3137 TAMU
College Station, Texas 77843-3137
jvarni@tamu.edu

Appendix N

Scoring criteria for the child and parent-proxy PedsQL™ questionnaires

---

The **Child and Parent Reports** of the **PedsQL™ 4.0 Generic Core Scales** for:

- Young Children (ages 5-7),
- Children (ages 8-12),
- And Teens (ages 13-18),

are composed of 23 items comprising 4 dimensions.

DESCRIPTION OF THE QUESTIONNAIRE:

Dimensions	Number of Items	Cluster of Items	Reversed scoring	Direction of Dimensions
Physical Functioning	8	1-8	1-8	Higher scores indicate better HRQOL.
Emotional Functioning	5	1-5	1-5	
Social Functioning	5	1-5	1-5	
School Functioning	5	1-5	1-5	

SCORING OF DIMENSIONS:

Item Scaling	5-point Likert scale from 0 (Never) to 4 (Almost always) 3-point scale: 0 (Not at all), 2 (Sometimes) and 4 (A lot) for the Young Child (ages 5-7) child report
Weighting of Items	No
Extension of the Scoring Scale	Scores are transformed on a scale from 0 to 100.
Scoring Procedure	**Step 1: Transform Score** Items are reversed scored and linearly transformed to a 0-100 scale as follows: 0=100, 1=75, 2=50, 3=25, 4=0. **Step 2: Calculate Scores** Score by Dimensions: • If more than 50% of the items in the scale are missing, the scale scores should not be computed, • Mean score = Sum of the items over the number of items answered. Psychosocial Health Summary Score = Sum of the items over the number of items answered in the Emotional, Social, and School Functioning Scales. Physical Health Summary Score = Physical Functioning Scale Score **Total Score**: Sum of all the items over the number of items answered on all the Scales.
Interpretation and Analysis of Missing Data	If more than 50% of the items in the scale are missing, the Scale Scores should not be computed. If 50% or more items are completed: Impute the mean of the completed items in a scale.