Facilitating lifestyle behavior change in the primary care setting with a staged approach to childhood obesity treatment

Maren Mae Wolff
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Facilitating lifestyle behavior change in the primary care setting with a staged approach to childhood obesity treatment

by

Maren Mae Wolff

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Nutritional Sciences

Program of Study Committee:
Lorraine Lanningham-Foster, Major Professor
Ruth Litchfield
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Greg Welk

The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University
Ames, Iowa
2018

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NOMENCLATURE

BAP  Brief Action Planning
BMI  Body Mass Index
FNPA Family Nutrition and Physical Activity
MHMW My Health, My Way!
MI  Motivational Interviewing
NVS  Newest Vital Sign
PCP  Primary Care Provider
RDN  Registered Dietitian Nutritionist
US  United States
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Childhood obesity treatment has become a priority due to the increasing prevalence of obesity in the United States. Evidence-based recommendations have been developed to guide treatment using a staged approach, where the first two levels of treatment occur in primary care with a focus on lifestyle behavior change. The purpose of this dissertation is to explore lifestyle behavior change in the primary care setting using the staged approach for childhood obesity treatment by: (1) examining primary care providers’ (PCPs) current practices, barriers and needed improvements; (2) determining the effectiveness of an intervention for treatment using a lifestyle behavior screening tool and health coaching; and (3) examining action plans and experiences of families participating in the intervention. The first study found that 63% of surveyed PCPs always/often use a screening tool to assess patients’ eating and physical activity behaviors, but only 41% always/often track these behaviors. PCPs identified their top treatment barrier as limited time and identified needing better counseling tools. The second study found that after a six-month intervention using a lifestyle behavior screening tool and health coaching, participants in the intervention group had greater improvements in lifestyle behavior change measured by the Family Nutrition and Physical Activity screening tool compared to the control group, but the difference was not significant (intervention: 4.86 ± 6.28; control: 0.38 ± 4.6; \( p = 0.135 \)). However, the effect size (\( d = 0.88 \)) is considered to be large. The third study identified that the key differences among action plans of intervention participants were related to the relationship to a particular lifestyle behavior, as well as the contextual detail in an action plan. Common themes identified in participant interviews included accountability, an interest in experiential learning and resources, and perceived program benefit. Findings of this dissertation support the need for
additional research on behavior change interventions in primary care that promote self-
management of health more broadly, as well as to explore other factors in lifestyle behavior
change (e.g., cognitive skills) that aren’t routinely addressed in current approaches to
treatment.
CHAPTER 1. INTRODUCTION

Childhood obesity prevention and treatment have become significant priorities in the United States (US) because childhood obesity has more than tripled since the 1970s. Currently more than one-third of children are currently experiencing overweight or obesity. Similarly, parents and caregivers of these children are also likely to be experiencing overweight or obesity, which affects more than two-thirds of US adults. Yet without significant prevention and treatment efforts, the increasing trends in prevalence are likely to continue. Children with overweight and obesity are more likely to become adults with overweight and obesity, and may experience greater severity of obesity as adults, too.

While the prevalence of obesity is high overall in the US, certain populations are disproportionately affected. For instance, individuals with lower socioeconomic status and individuals from rural areas have a higher prevalence of obesity. Additionally, obesity prevalence is higher among certain racial and ethnic groups. Hispanic and non-Hispanic black children have a higher prevalence of obesity compared to non-Hispanic white children (21.9% and 19.5% versus 14.7%). In adulthood, non-Hispanic black women have a higher prevalence of obesity compared to non-Hispanic black men (56.9% versus 37.5%), as do Hispanic women compared to Hispanic men (45.7% versus 39%).

One of the main concerns surrounding obesity is the development of co-morbidities. Children with obesity may experience type 2 diabetes, hypertension, dyslipidemia, obstructive sleep apnea, and non-alcoholic fatty liver disease, all of which were previously considered to be adult diseases. Obesity in adulthood is also associated with type 2 diabetes, cardiovascular disease, and some cancers, all three of which are among the leading causes of death in the US and yet are preventable. In addition to the physical consequences
of obesity, the financial costs are also substantial. The medical cost of obesity in the US is approximately $150 billion per year.\textsuperscript{13} Finally, the consequences of obesity even extend into the school and work settings as obesity is associated with poorer educational outcomes and work productivity for children and adults.\textsuperscript{14,15}

While the prevalence and consequences of obesity are known, the cause of energy imbalance leading to obesity is less clearly attributable because obesity is multifactorial. The contributing factors likely vary from individual to individual as a result of each individual’s interaction with the environment. Proposed causes and risk factors of obesity include an imbalance in caloric intake and expenditure, environmental changes leading to decreased physical activity and increased sedentary time, increased availability and convenience of energy-dense foods, decreased sleep duration, endocrine disorders, genetics and epigenetics, pre-natal factors, as well as many other psychosocial factors, such as lower socio-economic status, adverse childhood events, poor family functioning, and maladaptive feeding practices, among many other factors.\textsuperscript{16–18}

With a number of factors contributing to obesity, finding appropriate settings and solutions capable of addressing the complexity of the issue is a challenge. Several public health initiatives have attempted to curb childhood obesity prevalence through primary prevention, which targets all children regardless of weight status (Table 1.1), such as former First Lady Michelle Obama’s “Let’s Move” campaign\textsuperscript{19} and the Let’s Go! 5-2-1-0 initiative (https://mainehealth.org/lets-go).\textsuperscript{20,21} Other aspects of society have also been the focus of environmental change to promote healthier lifestyles, such as restaurant menu labeling with calorie information,\textsuperscript{22,23} taxation of sugar-sweetened beverages,\textsuperscript{24,25} body mass index (BMI)
Table 1.1 Primary, secondary, and tertiary childhood obesity prevention.

<table>
<thead>
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<th>Strategies</th>
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<td></td>
<td>School-based health promotion programs for healthy eating and physical activity</td>
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<td></td>
<td>Eating and physical activity messages or programs intended to prevent incidence of overweight/obesity and/or provide a supportive environment for weight maintenance</td>
<td>N/A</td>
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<tr>
<td></td>
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Note: Adapted from 35 screenings and obesity prevention programming in schools,26–28 as well as initiatives for active transportation in a number of communities.29–31
Primary prevention initiatives are important for establishing environments and cultural norms supportive of healthy lifestyles. However, secondary and tertiary obesity prevention is also of great importance to help children who already have overweight and obesity, and potentially co-morbidities, to prevent persistence of these issues into adulthood. While primary prevention may take place in community, school, and health care settings, secondary and tertiary prevention most often occurs in health care settings due to increased structure and intensity of interventions, as well as the need for medical supervision of co-morbidities. Furthermore, health care has been described as a good setting for identifying overweight and obesity because the setting helps frame the issue as a medical concern and also provides privacy in addressing the issue.32

An important health care setting for all levels of childhood obesity prevention is the primary care office. Primary care providers (PCPs), such as pediatricians, family medicine physicians, physician assistants, and nurse practitioners, have access to many children and parents/caregivers. In the US, most children 18 years and under (96%) have a usual place of health care, most often a doctor’s office or clinic.33 Furthermore, the majority of parents/caregivers (77%) report their child has seen a doctor or other health professional in the last six months.

PCPs are typically well-respected and viewed as trusted sources of information by children and families. Parents/caregivers also believe PCPs have a central role in screening for childhood obesity and communicating associated health implications.34 With regards to secondary and tertiary prevention, PCPs have the ability to assess risk factors for childhood obesity and potential co-morbidities, as well as to provide specific guidance and counseling for health-related behaviors associated with obesity.
Hence, primary care is an important setting for secondary and tertiary prevention, also known as obesity treatment. In 2007, an Expert Committee brought together by the American Medical Association released recommendations for the treatment of obesity, proposing a framework of a staged approach that progresses in the frequency and intensity of the treatment. While these recommendations are evidence-based and have been in place for over a decade, little research has been done to explore the utilization and effectiveness of the framework in real-world primary care settings. The staged treatment approach remains an idealized practice. Additional study is needed to understand the current status of childhood obesity treatment and to examine the feasibility of treatment in primary care in order to promote best practices.

The chapters presented in this dissertation seek to address these research needs. In Chapter 2, a comprehensive review of the literature discusses the overall Expert Committee recommendations for childhood obesity treatment, the recommended components of treatment in primary care, and a summary of treatment studies conducted in primary care. Then in Chapter 3, the first paper examines PCPs’ current practices, barriers, and needed improvements for childhood obesity in the state of Iowa. Chapter 4 includes a paper about a pilot study in primary care seeking to provide treatment using behavior modification strategies. Chapter 5 includes a paper about a qualitative analysis of the action plans and experiences of families participating in the pilot study. Finally, in Chapter 6, a general summary and conclusions are discussed relative to the future of childhood obesity treatment in primary care.
References


CHAPTER 2. REVIEW OF LITERATURE

Expert Committee Recommendations

The 2007 Expert Committee recommendations are at the forefront of childhood obesity treatment in the primary care setting. The Expert Committee, composed of experienced scientists and clinicians representing 15 national health care organizations, was brought together by the American Medical Association in partnership with the Centers for Disease Control and Prevention (CDC) and the Health Resources and Service Administration. The Expert Committee developed the recommendations to provide guidance for assessment, prevention, and treatment of overweight and obesity in children and adolescents (Figure 2.1).1–3 Relative to assessment, the recommendations outline two key components: body mass index (BMI) percentile and medical history, including modifiable lifestyle behaviors.1,2

BMI Screening

BMI percentile is used to classify overweight and obesity in children and adolescents ages 2-20 years. BMI is a measure of weight in relation to height, defined as weight (kg)/height squared (m²). Criteria for BMI percentile have been defined based on sex-specific BMI-for-age growth charts from the CDC.4 In children and adolescents, overweight is defined as a BMI $\geq 85^{th}$ percentile and $<95^{th}$ percentile, and obesity is defined as a BMI $\geq 95^{th}$ percentile.2

While BMI is not a direct measure of adiposity, it is a proxy that is feasible for screening use because it is minimally invasive compared to other methods of direct adiposity measurement such as density-based methods (e.g., hydrodensitometry and air displacement
Figure 2.1  Expert Committee recommendations for assessment, prevention, and treatment of overweight and obesity.

Note: Adapted from 1,5
plethysmography), scanning methods (e.g., dual-energy X-ray absorptiometry (DXA)), and computerized tomography (CT). While there are other methods to assess adiposity that are less invasive, such as bioelectrical impedance analysis (BIA) and anthropometric methods such as skinfold measurements and waist circumference, these methods are not routinely used in health care settings.

BMI is most frequently used for identifying overweight and obesity because of its simplicity and because it is beneficial in surveillance at the population-level, although using BMI is not without limitations. Using BMI as an indicator of adiposity assumes that all individuals with a normal BMI have normal adiposity levels and that a BMI above the normal range equates to an increase in adiposity. In children, BMI has been found to have high specificity and moderate sensitivity, with potentially a quarter of children having excess adiposity but not identified as having obesity based on BMI, often referred to as normal-weight obesity.\textsuperscript{6} BMI does not distinguish between lean mass and fat mass. Therefore, using more direct measures of adiposity may have additional benefit for identifying obesity in children. Other limitations of using BMI with children include variances that exist between age, sex, and maturity, as well as differences between ethnicities. Despite the limitations, increased BMI in childhood has been shown to be associated with increased cardiovascular risk factors and psychological morbidity.\textsuperscript{7,8}

In 2017 the United States Preventive Services Task Force (USPSTF) released a recommendation statement regarding the screening of obesity in children and adolescents.\textsuperscript{9} The recommendation states that clinicians should “screen for obesity in children and adolescents 6 years and older and offer or refer them to comprehensive, intensive behavioral interventions to promote improvements in weight status (B recommendation).” Based on the
USPSTF grading system, a B recommendation suggests that there is “high certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial.” Additionally, while BMI percentile is the recommended screening method for obesity, the USPSTF also mentions assessing specific risk factors associated with obesity, such as parental obesity, sedentary behaviors, and low socioeconomic status, in addition to inadequate nutrition, physical activity, and sleep.

**Assessment**

The Expert Committee recommends assessment of medical history to include identifying modifiable lifestyle behaviors, assessing current and future risk of co-morbidities, and determining a family’s and patient’s motivation and readiness for change. While assessing co-morbidities through physical examinations and laboratory assessments may be more commonplace in primary care, assessing and tracking lifestyle behaviors is a less common and consistent practice. However, the Expert Committee recommendations note that prior to beginning childhood obesity treatment, behavioral risks such as eating, physical activity, and sedentary behaviors associated with energy imbalance should be assessed. At the time of the publication of the Expert Committee recommendations in 2007, the only tool mentioned that included some assessment of dietary and physical activity behaviors in one tool was the WAVE (Weight Activity Variety Excess) Screener. WAVE has been studied for feasibility and acceptability, but no validity or reliability studies have been conducted. However, since 2007 other lifestyle behavior screening tools have been developed and have been used in the primary care setting, including the Healthy Habits Questionnaire and the Family Nutrition and Physical Activity (FNPA) screening tool. Many primary care settings and health systems have even incorporated these screening tools or similar screening questions into the electronic health record (EHR). The challenge with assessing and tracking
lifestyle behaviors in primary care is that few tools exist that (1) address all of the associated behaviors, (2) are brief enough to be conducted and reviewed during the course of an office visit, and (3) have been studied for validity and reliability.

The Healthy Habits Questionnaire was developed by Let’s Go!, a childhood obesity prevention initiative from Maine that has been adopted by various programs and organizations across the US for its simple, consistent message. The main messaging of Let’s Go! is 5-2-1-0, recommending children eat five (5) or more fruits and vegetables a day, have two (2) hours or fewer of recreational screen time, one (1) hour or more of physical activity a day, and zero (0) sugar-sweetened beverages. The program and messaging are suggested to be evidence-based and have been evaluated through clinical and community-based interventions.\textsuperscript{15–20}

The Healthy Habits Questionnaire has ten items and involves assessing each of the 5-2-1-0 behaviors, in addition to other risk factors such as family meals, breakfast consumption, and sleep. The tool was originally described as being completed with “yes” or “no” answers, but has since been revised to gather mostly open-ended quantitative responses.\textsuperscript{16} The questionnaire is included in the Let’s Go! Health Care Tool Kit (https://mainehealth.org/lets-go/childrens-program/pediatric-family-practices) and is recommended to be used in the primary care setting at all well-child visits to assess behaviors. The Health Care Tool Kit also recommends PCPs review the questionnaire with patients and parents as a means of starting a conversation around healthy lifestyles. It also includes a variety of other resources to help clinicians (1) connect to their community, (2) measure and assess BMI, and (3) have respectful conversations with patients and families about healthy lifestyles and weight. Despite the Healthy Habits Questionnaire’s wide
distribution through the Health Care Tool Kit and use in clinical and even school settings, very little research has been published regarding the use of this tool and no research has been published about its validity.

Another screening tool for assessing lifestyle behaviors associated with obesity is the Family Nutrition and Physical Activity (FNPA) screening tool (http://www.myfnpa.org). The FNPA was originally developed in collaboration with the Academy of Nutrition and Dietetics (formerly the American Dietetic Association) as part of the evidence analysis project to examine the strength of evidence of dietary and physical activity behaviors to childhood overweight and obesity. Ten factors that were positively associated with overweight and obesity became the constructs of the FNPA. The ten constructs, each composed of two questions, include the following: (1) family meals, (2) family eating practices, (3) food choices, (4) beverage choices, (5) restriction/reward, (6) screen time, (7) healthy environment, (8) family activity, (9) child activity, and (10) sleep routine. Each of the 20 questions is scored on a four-point Likert scale of “never/almost never,” “sometimes,” “often,” and “very often/always.” Scoring of the FNPA includes a total FNPA score of all items on the tool, as well as individual scores for the ten constructs. The total FNPA score can range from 20 to 80, with a lower score indicating more obesity-related lifestyle behaviors.

The FNPA has been validated and has been found to predict BMI change as well as explain unique variance after taking into account a baseline BMI and parent BMI. Yee et al. (2015) found that the FNPA is associated with risk for having excess adiposity and acanthosis nigricans in a low socioeconomic and racially diverse population. Tucker et al. (2017) found an inverse relationship with FNPA scores and obesity severity in youth.
presenting for weight management programs. Compared to youth with overweight and obesity, youth with class 2 and class 3 obesity were more likely to have FNPA scores in the three lowest quartiles. Additionally, for every 1-point increase in FNPA score, BMI decreased by 0.12 kg/m² and percent body fat decreased by 0.17% after adjusting for age and sex. In addition to the relationship with adiposity, Yee et al. (2011) showed that FNPA score had an inverse relationship with CVD risk factor profiles in 10-year-old children. While the FNPA has been used with a variety of ages of children and adolescents, it seems to have stronger utility for use with younger children compared to adolescents. Overall the FNPA has potential for use in the primary care setting as a screening tool to identify modifiable lifestyle behaviors.

**Staged Treatment Approach**

A key feature of the Expert Committee recommendations is the staged treatment approach. This step-wise progression of treatment increases in intensity over time depending on patient and family response to treatment, as well as their level of motivation for change. Stage 1 treatment, Prevention Plus, is suggested to take place in the primary care setting and be implemented by the PCP and/or trained professional staff (e.g., Registered Nurse or Registered Dietitian Nutritionist (RDN)). The focus of Stage 1 is healthy eating and physical activity habits, including: (1) eating five or more servings of fruits and vegetables each day, (2) reducing sugar-sweetened beverage consumption, (3) decreasing television time to 2 hours or less per day, (4) being physically active for at least one hour each day, (5) preparing more meals at home instead of dining out, (6) eating at the table as a family at least 5 or 6 times per week, (7) consuming a healthy breakfast each day, (8) including the entire family in lifestyle changes, (9) allowing the child to self-regulate eating and avoiding overly restrictive feeding behaviors, and (10) helping families tailor recommendations for behaviors...
to their cultural values. The frequency of encounters is to be based on readiness to change and tailored to the needs of the patient and family, although monthly follow-up assessments are recommended. After three to six months in this stage of treatment, BMI percentile should be reassessed and if there has been no improvement it is recommended to advance to Stage 2 treatment.

Stage 2, Structured Weight Management, is also suggested to occur in the primary care setting or with support of other health professionals such as referral to a RDN. This stage is recommended to focus on the same behaviors as in Stage 1, with additional structure and support. Stage 2 treatment visits may be individual or group-based and occur with greater frequency (i.e., monthly or more frequently) for an additional three to six. If there has been no improvement in BMI percentile, it would be recommended to move on to Stage 3 treatment.

Stage 3, Comprehensive Multidisciplinary Intervention, involves the collaboration of a multidisciplinary team for greater intensity of behavior modification. This team is recommended to include a behavioral counselor (e.g., social worker, psychologist), a RDN, and an exercise specialist. This level of treatment typically exceeds the capacity of primary care due to the specialists involved and often takes place in a tertiary care clinic. Structured nutrition and physical activity interventions may be provided to improve diet quality and lead to negative energy balance. Additionally, behavioral components may include food monitoring, goal setting, and contingency management. It is recommended that this level of treatment would occur on a weekly basis for at least 8-12 weeks, followed by monthly visits to maintain behavior change. The goal of this stage is weight maintenance or weight loss
until BMI is <85th percentile. However, not meeting this goal in Stage 3 is not an automatic qualification to move to Stage 4 treatment.

Stage 4, Tertiary Care Intervention, is recommended to be initiated based upon treatment response, age, health risk, and motivation. Treatment in this stage is most appropriate for adolescents and involves more medical management of obesity through very low calorie diets, meal replacements, medications, and bariatric surgery. Similar to Stage 3, this level of treatment also involves a multidisciplinary team and may include additional subspecialists in endocrinology, cardiology, sleep medicine, and bariatric surgery. Stage 4 treatment should follow standard clinical protocols for evaluation of patients throughout the course of treatment, focusing on physical and emotional effects of the treatment.

Overall, the Expert Committee states that, “the primary goal of obesity treatment is improvement of long-term physical health through permanent lifestyle habits.”1 Given the step-wise progression through the staged treatment approach, Stage 1 and Stage 2 treatment have the potential to impact the greatest number of children and prevent the need for progression to stages of more intensive interventions. As opposed to more emphasis on medical management of obesity in Stage 3 and Stage 4, the focus of Stage 1 and Stage 2 is lifestyle behavior change.

Lifestyle behavior change

In addition to targeting key behaviors associated with obesity, the process of facilitating behavior change is also very important. The Expert Committee recommendations discuss the role of patient-centered communication and motivational interviewing (MI) in particular.1,3 MI is a type of patient-centered communication and counseling that can be used to engage and motivate patients.30 It focuses on establishing the patient’s motivation and reasoning for behavior change in addition to goal setting. Additionally, MI involves the
patient in setting an agenda for discussion as opposed to the health professional directing conversation or providing unsolicited advice or information. Key components for MI include reflective listening and eliciting change talk. Reflective listening phrases such as, “If I heard you correctly…” or “It sounds like…” are used to clarify understanding, provide affirmation, and show empathy. Change talk, or discussing reasons for changing, is also an important part of MI to work towards behavior modification.31

MI has been used frequently for health behavior change with adults, including in the context of obesity. MI-based childhood obesity interventions have shown some success in relation to behavior change,20,30,32–34 but interventions have not necessarily shown significant effects on BMI-related outcome measures. However, if the recommended focus of obesity treatment is lifestyle behavior change, then MI seems to be important to facilitate change. MI brings together assessment and intervention, allowing the health care professional to help families determine priorities and potential barriers to change. Additional research is needed to further explore the relationships between MI, behavior change, and BMI-related outcome measures in childhood obesity treatment.

**Primary care providers and other health professionals**

PCPs play an important role in the assessment and treatment of childhood obesity. While traditional office visits in primary care tend to work well for acute conditions, chronic conditions like obesity require a different type and integration of care.1 Under the current, more traditional system of health care in the US, several studies have sought to identify PCPs’ practices and barriers related to childhood obesity treatment at state and national levels. Common barriers to childhood obesity treatment identified by PCPs include lack of time, lack of referral options or systems, lack of patient or family motivation, lack of reimbursement, lack of resources, and lack of training relative to obesity and counseling.35–40
The lack of time PCPs have to devote to providing childhood obesity treatment in primary care is of significant concern. The findings of the USPSTF suggest that \( \geq 26 \) hours of contact time is necessary for successful childhood obesity interventions with regards to weight status.\(^9\) Additionally, interventions with 52 contact hours or more lead to increased weight loss as well as positives changes in cardiovascular and metabolic risk factors. The USPSTF cites that these more intensive interventions rarely occur in the primary care setting and often require referral to a specialty clinic. Interventions with one to five contact hours typically involved individual sessions, targeted the parent and child, used MI, and often occurred in the primary care setting. Interventions with \( \geq 26 \) contact hours involved group and/or individual sessions with the parent and child, and were often conducted in specialty clinic settings. Additionally, these interventions included a variety of sessions that provided information about healthy eating, safe exercising, and reading food labels, as well as emphasized stimulus control, goal setting, self-monitoring, contingent rewards, and problem solving. These interventions also often included supervised physical activity opportunities. Multidisciplinary teams were most often involved in intensive interventions, involving pediatricians, exercise physiologists or physical therapists, RDNs, psychologists or social workers, or other behavioral specialists.

PCPs have had to learn to navigate the rise in overweight and obesity in children. Unfortunately support structures and referral systems have not been in place widely to assist PCPs in managing the influx of patients requiring weight and chronic disease management. Based on the barriers PCPs have identified for childhood obesity treatment such as lack of time, training, and resources, the inclusion of supporting providers would seem to be essential in order to increase patient contact hours. However, referral to pediatric
subspecialists may be a barrier for many PCPs due to the shortage of pediatric subspecialists.\textsuperscript{41,42} Other health care professionals could play an important role in supporting PCPs in the provision of Stage 1 and Stage 2 treatment.

\textit{Registered Dietitian Nutritionists}

One health care professional that is commonly mentioned in childhood obesity treatment recommendations is the RDN. In a review addressing the status of childhood obesity in primary care since the Expert Committee report in 2007, Lenders et al. (2016) suggest that interventions with greater intensity and that include supporting providers (e.g., RDNs) are more successful.\textsuperscript{5} The authors further discuss that while different allied health care professionals have not been compared for effectiveness in obesity treatment, “one could argue that RD[N]s would be best equipped to promote healthy eating,” although also acknowledging that reimbursement and integration into primary care are challenges. In the 2013 “Position of the Academy of Nutrition and Dietetics: Interventions for the Prevention and Treatment of Pediatric Overweight and Obesity,” Hoelscher et al. suggests that RDNs should be involved in multiple aspects of childhood obesity treatment, including screening, assessment, and programming.\textsuperscript{43}

With regards to the staged treatment approach recommended by the 2007 Expert Committee, the involvement of a RDN is mentioned beginning in Stage 2.\textsuperscript{1} Although a 2015 update from the American Academy of Pediatrics (AAP) Institute for Healthy Childhood Weight mentions involvement of a RDN beginning in Stage 1.\textsuperscript{44} RDNs have a skillset that would support facilitating lifestyle behavior change through MI in both stages. Many RDNs have had training in MI because educational standards for RDNs include learning effective counseling and behavior change theories and techniques.\textsuperscript{45} RDNs may also obtain additional training to support childhood obesity treatment. The Commission on Dietetic Registration
(CDR) offers a Certificate of Training in Childhood and Adolescent Weight Management for RDNs. This training program aims to develop RDNs as comprehensive weight management care providers specifically for children and adolescents, and includes additional training in MI. Furthermore, CDR recently developed an interdisciplinary Board Certified Specialist in Obesity and Weight Management (CSOWM) credential. This specialist certification is open to RDNs, as well as nurse practitioners, physician assistants, exercise physiologists, psychologists, and social workers.

RDNs seem to be a logical fit to support childhood obesity treatment in primary care, and there is also some evidence to suggest they are effective in that role. For instance, in one study RDNs in primary care settings delivered a standardized medical nutrition therapy (MNT) protocol called KIDPOWER. Children with at least three MNT visits had improvements in obesity-related lifestyle behaviors and BMI z-score. Additionally, RDN visits in a comprehensive weight management program have been shown to be associated with improved BMI, independent of dietary approach and level of engagement with group exercise, when nutrition counseling is provided at least once per month.

Recommendations for incorporating the RDN into the primary care setting have been outlined, including a suggested pediatric weight management protocol from the Alliance for a Healthier Generation. This protocol outlines a series of eight visits between a PCP and a RDN to provide Stage 1 treatment. The protocol is a covered benefit under some insurance plans through the Healthier Generation Benefit, though the coverage is not widespread and the model has not been studied.

Despite RDNs having demonstrated effectiveness in childhood obesity treatment and recommendations calling for their inclusion, they are rarely incorporated into the primary
care setting. The barrier most commonly cited for RDN integration into primary care is inadequate reimbursement. RDNs are typically only able to bill for episodic MNT visits of limited diagnoses under a fee-for-service model of healthcare.\textsuperscript{50}

\textit{Health coaches}

If additional health care professionals are needed to support PCPs in providing childhood obesity treatment in primary care, it may be necessary to begin with leveraging the capacity of health care professionals already present in the primary care office such as nurses, medical assistants, or other support staff. Because the focus of Stage 1 and Stage 2 treatment is lifestyle behavior change as opposed to medical management, these support staff could assist in the facilitation of behavior change through MI and goal setting with patients.

Health coaching is a strategy for chronic disease management, including obesity, which has been used most commonly with adults. Health coaching involves developing a collaborative relationship with a patient to help him/her identify health goals and obtain the knowledge, resources, and self-efficacy necessary to meet those goals.\textsuperscript{51} Health coaching can be both a framework for engaging with patients, as well as a specific job category. A variety of health care professionals can obtain training or certificates in health coaching, though the training varies by the program. However, in 2016 the International Consortium for Health and Wellness Coaching (ICHWC) began a partnership with the National Board of Medical Examiners to launch a National Board Certification for Health and Wellness Coaches in 2017 and provide standardization for health and wellness coach programs.\textsuperscript{52} The ICHWC also released a scope of practice for a health and wellness coach, including that “health and wellness coaches work with individuals and groups in a client-centered process to facilitate and empower the client to develop and achieve self-determined goals related to health and wellness.”\textsuperscript{53} Additionally, the scope of practice states,
“While health and wellness coaches per se do not diagnose conditions, prescribe treatments, or provide psychological therapeutic interventions, they may provide expert guidance in areas in which they hold active, nationally recognized credentials, and may offer resources from nationally recognized authorities such as those referenced in ICHWC’s healthy lifestyle curriculum.”

Health coaching has shown promise as a self-management approach for chronic conditions with adults, however research on health coaching with children and families is limited.54

**Summary and Discussion of Stage 1 and Stage 2 Treatment Studies**

While the 2007 Expert Committee childhood obesity treatment recommendations are evidence-based and consensus-based, minimal research has been done to evaluate the staged approach framework. The majority of research has been on individual stages of treatment as opposed to the overall progression through stages of treatment. This section contains a summary of childhood obesity treatment interventions published since the 2007 Expert Committee report that were either self-described or estimated at Stage 1 or Stage 2 treatment, were conducted in the US, and included children 2-12 years of age (Tables 2.1 and 2.2). A total of 17 studies were included that met the criteria.

**Treatment Format**

Determining the exact staging of interventions can be challenging and open to interpretation because the staged approach is a framework and stages are not specifically defined. In general, Stage 1 is marked by a low intensity intervention in the primary care office, with the PCP and/or support staff. Stage 3 is marked by visits with multidisciplinary specialists. Stage 2 falls somewhere in between and perhaps has the most variability in terms of format, intensity, location, and interventionists.

In this review, Stage 1 interventions most often involved individual sessions that took place in the primary care office or via telehealth, with support from one other health care professional or trained interventionist, and with sessions typically occurring less frequently
Table 2.1 Description of Stage 1 and Stage 2 treatment studies.

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Stage</th>
<th>Design</th>
<th>Sample</th>
<th>Child Age (yrs)</th>
<th>Eligibility</th>
<th>Treatment Description</th>
<th>Interventionist</th>
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<tbody>
<tr>
<td>Looney, 2014 (^{55})</td>
<td>1</td>
<td>RCT</td>
<td>22 children + families</td>
<td>4-10</td>
<td>BMI ≥85th percentile</td>
<td><strong>Newsletter (N):</strong> usual care plus six monthly newsletters on nutrition and activity topics&lt;br&gt;<strong>Newsletter + Growth Monitoring (N+GM):</strong> same as N plus monthly monitoring and feedback on child's growth (three 15 min in-person visits, three 10 min phone calls)&lt;br&gt;<strong>Newsletter + Growth Monitoring + Family-based Behavioral Counseling (N+GM+C):</strong> same as N+GM plus counseling on behavioral strategies (three 30 min in-person visits, three 20 min phone calls)</td>
<td>Trained interventionist</td>
</tr>
<tr>
<td>O'Connor, 2011 (^{56})</td>
<td>1</td>
<td>RCT</td>
<td>40 parent-child dyads</td>
<td>5-8</td>
<td>BMI 85th-99th percentile</td>
<td><strong>Control:</strong> regular care, wait-list for intervention&lt;br&gt;<strong>Intervention:</strong> individual monthly sessions to set for goals for child behavior and parenting practices to change, follow-up phone call between sessions</td>
<td>Trained health advisors</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Stage</td>
<td>Design</td>
<td>Sample</td>
<td>Child Age (yrs)</td>
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| Resnicow, 2015<sup>32</sup> | 1 | RCT | 645 parent-child dyads | 2-8 | BMI $\geq$85th percentile and $\leq$97th percentile | *Usual Care:* routine care from PCP and standard education materials  
*Provider Only:* PCP delivered 4 MI sessions in-person  
*Provider + RDN:* PCP delivered 4 MI sessions in-person plus 6 MI sessions from a RDN in-person or by telephone | PCP, RDN |
| Stovitz, 2014<sup>37</sup> | 1 | RCT | 72 parent-child dyads | 4-8 | BMI $\geq$85th percentile | *Control:* usual care, handouts on school readiness and performance  
*Intervention:* lifestyle behavior recommendations and MI on a monthly basis in-person or by phone (15-30 min) | Research assistant |
| Parra-Medina, 2015<sup>38</sup> | 1 | RCT | 118 parent-child dyads | 5-14 | BMI $\geq$85th percentile; Hispanic | *Standard Care:* 4 visits and healthy lifestyle prescription with PCP  
*Intervention:* Standard Care plus newsletters and in-person counseling (one 30-minute visit) and monthly telephone counseling (15 min) with health educator | Health educator |
| Small, 2014<sup>59</sup> | 1<sup>*</sup> | RCT | 60 parent-child dyads | 4-8 | BMI $>85$th percentile | *Control:* 4 in-person sessions (30-60 min) on health and safety information using brief MI to set goals; phone calls between sessions  
*Intervention:* same as Control group but with healthy habits education | Trained research assistant |
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<tr>
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</thead>
</table>
| Taveras, 2011<sup>60</sup> | 1*    | RCT    | 475 parent-child dyads | 2-6 | BMI ≥85th percentile | *Usual Care:* well-child visits and follow-up visits for weight checks with pediatrician or subspecialist  
*Intervention:* primary care restructuring with enhanced electronic medical record; four 25 min in-person visits with nurse practitioner and three 15 min phone calls over one year using MI and educational modules | NP |
| Taveras, 2015<sup>61</sup> | 1*    | RCT    | 549 children + families | 6-12 | BMI ≥95th percentile | *Usual Care:* current standard of care with no new decision support tools  
*Clinical Decision Support (CDS):* clinicians received decision support for obesity management; patients/families received a self-guided behavior change intervention  
*CDS + Coaching:* clinician decision support; families received individualized coaching using MI by telephone at 1, 3, 6, and 9 months; interactive text messages twice weekly | Health coach |
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<tbody>
<tr>
<td><strong>Taveras, 2017</strong>&lt;sup&gt;62&lt;/sup&gt;</td>
<td>1*</td>
<td>RCT</td>
<td>721 children + families</td>
<td>2-12</td>
<td>BMI ≥85th percentile</td>
<td><strong>Enhanced Primary Care (Control):</strong> clinical decision support tools, education materials for self-guided behavior change, neighborhood resource guide, monthly text messages <strong>Enhanced Primary Care + Coaching:</strong> twice-weekly text messages, bimonthly coaching sessions (15-20 min) using MI in-person, by phone, or video conference</td>
<td>Health coach</td>
</tr>
<tr>
<td><strong>Tucker, 2014</strong>&lt;sup&gt;63&lt;/sup&gt;</td>
<td>2</td>
<td>Experimental</td>
<td>418 children + families</td>
<td>5-16</td>
<td>BMI ≥85th percentile</td>
<td>2-hour orientation plus 6 weekly 2-hour sessions of physical activity, nutrition education, behavioral counseling; use of &quot;Healthy Counts&quot; (8-7-6-5-4-3-2-1-0) curriculum; participants logged physical activity, screen time and dietary behaviors; Buddy Program including weekly contact with medical student to check-in on progress towards goals and logging</td>
<td>RDN, behavioral health provider, exercise specialist, medical students</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Stage</td>
<td>Design</td>
<td>Sample</td>
<td>Child Age (yrs)</td>
<td>Eligibility</td>
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| Arauz Boudreau, 2013 | 2*    | RCT    | 41 parent-child dyads | 9-12 | BMI ≥85th percentile; Latino | Wait-List Control: Intervention after 6 months  
Intervention: Group classes (1.5 hours) about nutrition, physical activity, and stress management for 5 weeks plus a sixth session 3 months later; concurrent culturally-sensitive health coaching in-person or by telephone for 6 months (monthly encouraged) | PCP, health educator, physical therapist, nutritionist, health coach |
| Butte, 2017 | 2*    | RCT    | 549 children + families | 2-12 | BMI ≥85th percentile | Primary Care: clinic-based program, Next Steps brief counseling materials for PCPs, families encouraged to seek follow-up visits for estimated 8 contact hours  
MEND Intervention: MEND2-5 included 9 weekly sessions (90 minutes); MEND/CATCH6-12 included 18 twice-weekly sessions (120 minutes); transition phase (9 months) offered monthly 90 min sessions; MEND2-5 offered 27 contact hours total and MEND/CATCH6-12 offered 49.5 hours plus 72 hours of YMCA sports | PCPS; RDNs, health educators, community health workers |
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<tr>
<th>Author, Year</th>
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<th>Sample</th>
<th>Child Age (yrs)</th>
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<th>Treatment Description</th>
<th>Interventionist</th>
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</thead>
<tbody>
<tr>
<td>Ewing, 2009</td>
<td>2*</td>
<td>EXP</td>
<td>73 parent-child dyads</td>
<td>8-12</td>
<td>BMI &gt;85th percentile</td>
<td>8 weekly group sessions with individual coaching (10-15 min); 3 monthly individual sessions (15 min); behavioral program on healthy eating and physical activity</td>
<td>Nurses</td>
</tr>
</tbody>
</table>
| Siwik, 2013  | 2*    | RCT    | 35 parent-child dyads | 8-11          | BMI >85th percentile | Control: lagged intervention start after 6 months  
Intervention: 12 week group office visits (90 min) on nutrition, physical activity, and resiliency | Family physician, nutritionist, family medicine residents |
| Wright, 2013 | 2*    | RCT    | 50 parent-child dyads | 9-12          | BMI >95th percentile | Wait-list Control: well-child visit; received intervention post-study  
IVR: 12 weeks of IVR calls (2 calls per week for each parent and child) designed to monitor, educate and counsel children and parents on weight management and TV time; EHR template for pediatrician to provide clinical decision support and counseling guidance | Interactive voice technology system       |
<table>
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<tr>
<th>Author, Year</th>
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<th>Child Age (yrs)</th>
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<tbody>
<tr>
<td>Quattrin, 2014&lt;sup&gt;69&lt;/sup&gt;</td>
<td>2*</td>
<td>RCT</td>
<td>105 parent-child dyads</td>
<td>2-5</td>
<td>Child BMI &gt;85th percentile; Parent BMI &gt;25 kg/m²</td>
<td>Information Control: 13 group sessions (60 min) over 1st year (4 weekly, 2 biweekly, 4 monthly, and 3 at 8- to 10-week intervals); 3 sessions in 2nd year (months 16, 20, and 24); Practice Enhancement Assistants called families between sessions (10 times in first year, 3 times in second year); dietary, physical activity, and sedentary time guidelines</td>
<td>Practice Enhancement Assistants (Master/Bachelor Degree in Psychology, Nutrition, Exercise Science, or equivalent, or were RDNs)</td>
</tr>
<tr>
<td>Norman, 2016&lt;sup&gt;70&lt;/sup&gt;</td>
<td>2*</td>
<td>RCT</td>
<td>106 parent-child dyads</td>
<td>11-13</td>
<td>BMI &gt;95th percentile; completion of 2 week run-in program</td>
<td>Enhanced Usual Care: physician visit, health educator visit, monthly mailed content</td>
<td>PCP, health educator</td>
</tr>
</tbody>
</table>

* = Stage estimated; BMI: body mass index; RCT: randomized controlled trial; MI: motivational interviewing; PCP: primary care provider; RDN: Registered Dietitian Nutritionist; EXP: experimental; min: minutes; hrs: hours
Table 2.2  Outcome measures and results of Stage 1 and Stage 2 treatment studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment Period</th>
<th>Study Period</th>
<th>Outcome Measures</th>
<th>Results</th>
<th>Retention Rate</th>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looney, 2014^55</td>
<td>6 months</td>
<td>6 months</td>
<td>Primary: BMI z-score Secondary: dietary intake, leisure-time behaviors</td>
<td>BMI z-score decreased across all interventions and corresponded to level of intensity with greatest change in the more intense condition. Effect sizes from baseline to 6 months: N = 0.12, N + GM = 0.26, and N + GM + BC = 0.34.</td>
<td>95%</td>
<td>Not discussed</td>
</tr>
<tr>
<td>O'Connor, 2011^56</td>
<td>6 months</td>
<td>7-8 months</td>
<td>BMI, child lifestyle behaviors, parenting practices</td>
<td>No differences between groups for BMI z-score, dietary intake, or physical activity post-intervention; intervention children watched significantly less TV compared to control group (14.9 hrs/week vs 23.3 hrs/week)</td>
<td>85%</td>
<td>Parents: $30 gift card at baseline, $40 gift card post intervention, $50 gift card for exit interview Child: $10 gift card at baseline, $10 gift card post intervention</td>
</tr>
<tr>
<td>Resnicow, 2015^32</td>
<td>2 years</td>
<td>2 years</td>
<td>BMI percentile</td>
<td>Difference in BMI percentile was 1.8, 3.8, and 4.9 BMI percentile units for Usual Care, Provider Only, and Provider + RDN groups respectively; Provider + RDN group mean was significantly lower than the Usual Care group; mean MI dose for PCPs in both groups was similar (3.3 and 3.4 out of 4 visits); mean dose for RDN contact was 2.7 (out of 6 visits)</td>
<td>71%</td>
<td>PCPs: $50/MI session; RDNs: $50/in-person session, $35/telephone session Practices: $25-75/child; startup incentives of $250-500; $400 for 50% retention, extra $400 for 80% retention Families: not discussed</td>
</tr>
<tr>
<td>Study</td>
<td>Treatment Period</td>
<td>Study Period</td>
<td>Outcome Measures</td>
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<td>Incentives</td>
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<tr>
<td>Stovitz, 2014&lt;sup&gt;57&lt;/sup&gt;</td>
<td>3 months</td>
<td>3 months</td>
<td>BMI z-score, lifestyle behaviors</td>
<td>Both groups improved BMI z-score (-0.07 for Control, -0.04 for Intervention); improvement in lifestyle behaviors was slightly but not significantly greater in the intervention group</td>
<td>89%</td>
<td>$20 gift card</td>
</tr>
<tr>
<td>Parra-Medina, 2015&lt;sup&gt;58&lt;/sup&gt;</td>
<td>18 weeks</td>
<td>18 weeks</td>
<td>BMI z-score, weight, waist circumference,</td>
<td>Significantly fewer children gained weight in the Intervention group compared to Standard Care group (68.5% vs. 89.7%) and waist circumference was similar; BMI z-score was not significant</td>
<td>95%</td>
<td>Not discussed</td>
</tr>
<tr>
<td>Small, 2014&lt;sup&gt;59&lt;/sup&gt;</td>
<td>4 months</td>
<td>6 months</td>
<td>BMI percentile, waist circumference, waist-by-height ratio</td>
<td>Intervention children had reduced waist circumference and waist-by-height ratio post-intervention, as well as at 3, and 6 months post-intervention with medium effect size ($f = 0.33$, 0.35); BMI percentile not differentially effected</td>
<td>75% after intervention; 50% three months post-intervention; 62% at six months post-intervention</td>
<td>Parents: $35 at each of 4 measurement points</td>
</tr>
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Table 2.2 continued

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment Period</th>
<th>Study Period</th>
<th>Outcome Measures</th>
<th>Results</th>
<th>Retention Rate</th>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taveras, 2011</td>
<td>1 year</td>
<td>1 year</td>
<td>Primary: BMI Secondary: Obesity-related behaviors</td>
<td>Intervention group had smaller, non-significant increase in BMI compared to Usual Care group; Intervention group had significant improvement in reduced TV viewing</td>
<td>93%</td>
<td>$20 at baseline and 1 year for telephone interview; co-pay reimbursement for NP visits for intervention participants; water bottles, jump ropes, snack containers</td>
</tr>
<tr>
<td>Taveras, 2015</td>
<td>1 year</td>
<td>1 year</td>
<td>BMI, Healthcare Effectiveness Data and Information Set (HEDIS) measures</td>
<td>BMI increased less in children in the CDS group (−0.51) compared to Usual Care group; CDS + Coaching group had a smaller magnitude of effect (−0.34); both CDS groups had greater achievement of HEDIS measures for childhood obesity and nutrition/physical activity counseling compared with usual care</td>
<td>94.4%</td>
<td>Not discussed</td>
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<tr>
<th>Study</th>
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<tbody>
<tr>
<td>Taveras, 2017</td>
<td>1 year</td>
<td>1 year</td>
<td>Primary: BMI z-score</td>
<td>Both groups had an improvement in BMI z-score (-0.06 for Enhanced Primary Care; -0.09 for Enhanced Primary Care + Coaching) but no significant difference between groups; both groups had improvement in parental resource empowerment and the coaching group had improvements in child health-related quality of life, but improvements were not significantly different between groups for either outcome</td>
<td>92%</td>
<td>Not discussed</td>
</tr>
<tr>
<td>Tucker, 2014</td>
<td>7 weeks</td>
<td>7 weeks</td>
<td>Primary: lifestyle behaviors</td>
<td>Increase in moderate to vigorous physical activity by 14 minutes, decreased screen time by 44 minutes, improved several dietary behaviors; significant increase (9%) in FNPA scores; significant decrease in BMI z-score (-0.03)</td>
<td>62%</td>
<td>Free taxi to classes (if needed); free childcare during classes; incentive point system and weekly prizes (e.g., jump ropes, water bottles, beach balls, hula hoops)</td>
</tr>
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</table>
Table 2.2 continued

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment Period</th>
<th>Study Period</th>
<th>Outcome Measures</th>
<th>Results</th>
<th>Retention Rate</th>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arauz Boudreau, 2013&lt;sup&gt;64&lt;/sup&gt;</td>
<td>6 months</td>
<td>6 months</td>
<td>Child health-related quality of life, BMI, BMI z-score, metabolic markers, dietary intake, physical activity</td>
<td>Health-related quality of life improved for both groups, with a larger but not significant improvement in the intervention group; no significant changes for BMI, metabolic markers, or physical activity for either group</td>
<td>63%</td>
<td>$15 gift certificate at first visit, $25 gift certificate at second visit</td>
</tr>
<tr>
<td>Butte, 2017&lt;sup&gt;65&lt;/sup&gt;</td>
<td>1 year (3 month intensive phase for MEND intervention group)</td>
<td>1 year</td>
<td>%BMI&lt;sub&gt;p95&lt;/sub&gt;, body composition, blood pressure, psychosocial status</td>
<td>MEND/CATCH&lt;sub&gt;6-12&lt;/sub&gt; had significantly greater improvements in %BMI&lt;sub&gt;p95&lt;/sub&gt; than Primary Care group for children 6-8yrs during the intensive phase with effect size of -1.94 percentage points; intervention compliance was inversely correlated to change in %BMI&lt;sub&gt;p95&lt;/sub&gt; during the intensive phase; %BMI&lt;sub&gt;p95&lt;/sub&gt; was maintained or rebounded for both programs at 1 year</td>
<td>54%, 78%, and 73% (MEND) versus 82%, 85%, and 81% (Primary Care) at 12 months for 2-5, 6-8, and 9-12 years</td>
<td>Not discussed</td>
</tr>
<tr>
<td>Ewing, 2009&lt;sup&gt;66&lt;/sup&gt;</td>
<td>5 months</td>
<td>1 year</td>
<td>BMI, weight</td>
<td>Completers (at least 6/8 sessions and 1/3 follow-up sessions) had mean weight loss of 2.8lbs; change in BMI z-score was significant at 5 months</td>
<td>51%</td>
<td>No monetary incentives provided</td>
</tr>
<tr>
<td>Study</td>
<td>Treatment Period</td>
<td>Study Period</td>
<td>Outcome Measures</td>
<td>Results</td>
<td>Retention Rate</td>
<td>Incentives</td>
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<tr>
<td>Siwik, 2013&lt;sup&gt;67&lt;/sup&gt;</td>
<td>3 months</td>
<td>15 months</td>
<td>Primary: BMI z-scores, weight, percent body fat</td>
<td>Significant effect on BMI z-score (-0.138 per 9 months); significant net shift of physical activity from low METS to high METS of 2.84 METs</td>
<td>91%</td>
<td>Not discussed</td>
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<td></td>
<td></td>
<td></td>
<td>Secondary: physical activity</td>
<td></td>
<td></td>
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<tr>
<td>Wright, 2013&lt;sup&gt;68&lt;/sup&gt;</td>
<td>3 months</td>
<td>3 months</td>
<td>Child &amp; parent BMI, dietary intake, TV time</td>
<td>No significant differences for BMI between groups; children classified as high users of the IVR significantly decreased weight, BMI and BMI z-score compared to low users</td>
<td>86%</td>
<td>Parents: $40 at baseline and 3 months Children: $10 at baseline and 3 months</td>
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<tr>
<td>Quattrin, 2014&lt;sup&gt;69&lt;/sup&gt;</td>
<td>2 years</td>
<td>2 years</td>
<td>BMI z-score, percent over BMI (BMI0%)</td>
<td>Compared to control, intervention children had significantly greater decreases in BMI0% and BMI z-score after treatment and follow-up; intervention parents had greater decreases in BMI throughout treatment and follow-up; changes in child weight were correlated with changes in parent weight at 1 and 2 years</td>
<td>Of the 96 participants that started and received treatment, 83% completed 12-month treatment; 73% completed the 24-month follow-up</td>
<td>Not discussed</td>
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<tr>
<td>Study</td>
<td>Treatment Period</td>
<td>Study Period</td>
<td>Outcome Measures</td>
<td>Results</td>
<td>Retention Rate</td>
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<tr>
<td>Norman, 2016</td>
<td>4 months</td>
<td>12 months</td>
<td>BMI, BMI z-score, BMI percentile, percent over median BMI, waist circumference,</td>
<td>Significant improvement in BMI for boys but not girls; intervention boys had total BMI difference of 1.3 and standardized effect size of 0.70; no between group differences for body fat, blood lipids, and blood pressure; 13% of intervention participants succeeded in stepping down from step 1 to step 2 or step 3</td>
<td>80%</td>
<td>Children: $15 at baseline, 4 months, 8 months; $25 at 12 months Parents: $15 at each assessment; $20 at each measurement for transportation costs</td>
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<td></td>
<td></td>
<td></td>
<td>body fat, blood lipids, blood pressure</td>
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BMI: body mass index; MI: motivational interviewing; PCP: primary care provider; RDN: Registered Dietitian Nutritionist; TV: television; FNPA: Family Nutrition and Physical Activity
than bi-weekly (often monthly). Stage 2 interventions occurred in primary care and/or community settings, often with support from more than one other health care professional (e.g., RDN, nurse, physical therapist, health educator, health coach), often occurring through group sessions with or without additional individual sessions, and sessions were often weekly to biweekly for a period of time (e.g., often three months or less).

Interestingly, several of the reviewed studies compared different stages or intensities of treatment against one another (i.e., Stage 1 versus Stage 2). However, none investigated a multi-stage approach with participants progressing through stages per the Expert Committee recommendations. Norman et al. (2016) examined a reverse, “stepped-down” approach beginning with the most intensive contact initially and then scaling back contact after a period of time if goals were met. In this study, only 13% of participants succeeded in “stepping-down.”

Additional study is needed to investigate the Expert Committee staged treatment approach as a whole. While the recommendations are evidence-based, it is important to evaluate their feasibility, efficacy, and effectiveness to determine the actual merit of the recommendations and whether revision of the staged approach may be necessary to improve outcomes. If the staged approach is not being carried out in real-world clinical settings as recommended, it is important to understand why it isn’t utilized, what barriers exist, and what improvements are necessary.

**Behavior Modification**

Lifestyle behavior change and MI are two key components included in the Expert Committee recommendations. Of the studies reviewed, MI was used more commonly in Stage 1 interventions compared to Stage 2. Stovitz et al. (2014) investigated Stage 1 treatment with children 4-8 years of age with a BMI ≥85th percentile in a three-month
randomized controlled trial. A research assistant provided childhood obesity prevention education and facilitated MI with parents of children enrolled in the study on a monthly basis either in-person or by phone. The intervention group had slightly greater improvements in parent-reported child behaviors compared to the control group, though the magnitude of change was small. Additionally, 70% of intervention group had a decrease in BMI z-score after three months compared to 55% of the control group. While the authors found the intervention to be feasible for primary care, it is difficult to conclude what magnitude of change is clinically significant. Further study is necessary to explore short and long-term outcomes of similar interventions.

Resnicow et al. (2015) compared treatment with PCPs using standard care, PCPs using MI, and PCPs plus RDNs using MI. They found the PCP/RDN combination to be more effective in regards to improvements in BMI percentile compared to just PCPs using standard care (4.9 versus 1.8 BMI percentile difference). The authors note this study is among the first counseling interventions with MI to show significant effects on adiposity in the primary care setting. There was not a significant difference between the PCP standard care group and the PCP MI group. It is difficult to conclude though whether it was the six additional sessions offered by the RDNs in the PCP/RDN group, or the provision of treatment using MI specifically by a RDN that made the difference for this group. Interestingly, the completion rate of visits with the RDNs was somewhat low, with a mean of 2.7 out of 6 visits completed. Therefore it might be anticipated that the effect on BMI percentile may have been even greater if participants had completed the additional sessions. While this study involved the resource of another health care professional, the overall intensity of the intervention was fairly low with visits being spread out over 2 years.
The BMI² study by Resnicow et al. (2015) provides the beginnings of a model that could be effective for carrying out successful Stage 1 and/or Stage 2 treatment. Creating a partnership between PCPs and RDNs or another health care professional allows for greater contact with a patient and family without putting additional strain on the limited time availability of the PCP. The challenge, however, is that RDNs are not frequently incorporated into the primary care setting, and reimbursement for RDN services is a barrier. Primary care clinics with a RDN or other health care professional available are well poised to carry out Stage 1 and Stage 2 treatment as opposed to clinics that rely solely on PCPs.

**Outcome Measures**

Determining the success of an intervention significantly depends on the chosen outcome measures. Of the studies reviewed, all had outcome measures related to BMI, however few had outcome measures related to lifestyle behaviors. One challenge in comparing these studies is that the length of the interventions vary significantly from study to study, lasting anywhere from seven weeks to two years. It might be hypothesized that change in lifestyle behaviors may be more likely to occur over a shorter period of time compared to BMI-related measures although Tucker et al. (2014) saw significant improvements from baseline measurements in both BMI z-scores and lifestyle behaviors after a seven week intervention providing Stage 2 treatment. This intervention utilized several different health care providers and involved two hours of contact time each week. However, this study was experimental in design so further investigation with a randomized controlled trial is necessary to further explore the findings.

Given the USPSTF findings that suggest ≥26 contact hours over the course of two to twelve months may be necessary for change in BMI, this brief and lower-intensity intervention by Tucker would provide some encouragement for the outcomes of Stage 1 and
Stage 2 treatment. For example, if Stage 1 or Stage 2 treatment is recommended to occur over the course of three months (approximately 13 weeks), that would equate to at least two contact hours per week. Even over the course of up to six months, this would still be at least one contact hour per week. This level of frequency likely does not fit the general description of Stage 1 and Stage 2 treatment, which may include contact on a monthly to bi-weekly basis potentially. Additionally, this frequency and intensity is not likely to be sustainable by a PCP alone based on time and cost, yet involving additional health care professionals for support would also be a matter of feasibility in terms of cost or reimbursement of services.

In evaluating the impact of interventions on BMI, the USPSTF report discusses that a reduction of 0.15 to 0.25 in BMI z-score is associated with a reduction in cardiovascular and metabolic risk factors. Therefore, the USPSTF suggests that BMI z-score reductions of 0.20 to 0.25 are likely good targets. It is also noted that very limited evidence suggests shorter interventions may be effective for children that are overweight only, with BMI z-score reductions of ≤0.10.

The question then becomes, is it possible to have success with Stage 1 and Stage 2 treatment in primary care, and what is the definition of success? The Expert Committee report notes that the main goal of obesity treatment is “improvement of long-term physical health through permanent healthy lifestyle habits.” In a review addressing modifiable influences on childhood weight gain and recommendations for the family environment, Ritchie et al. (2005) note that “none of the recommendations address child weight because weight is not a behavior, but rather a reflection of the interface between genetics and behavior.” If successful treatment is defined by change in BMI percentile or BMI z-score, success may not be likely over a short period of time such as three months or even six
months, particularly with a low intensity intervention. If successful treatment is defined by behavior change, there might be potential for success with lower intensity interventions.

In a pilot study using the FNPA and MI, Christison et al. (2014) examined the acceptability and feasibility of the FNPA as a coaching tool during well-child visits, as well as the effect on parent-reported behavior change and provider efficacy. The coaching tool intervention had good patient and provider acceptability, although providers rated lower satisfaction for the duration of patient appointment, time spent to use the tool, and impact on workflow. At one month post-intervention, parents reported 68% success in meeting their lifestyle goal and 46% success at 6 months. This pilot study demonstrated the potential for using a lifestyle behavior screening tool to guide a brief intervention with MI-enhanced conversation in just one visit. Although further study is needed to determine the effect over time with more contact and potentially incorporating other health care professionals.

**Real-World Application**

An important factor to consider in all research related to the treatment of childhood obesity is the translational feasibility in terms of what is actually practical and sustainable for primary care practices. One part of that is considering outcome measures that are relevant to clinical practice and research, but do not significantly increase participant burden, whether that is for the patient or the health care provider. For instance, more objective measures of behavior change related to nutrition and physical activity would be beneficial. However, the resources required to conduct and monitor those types of measures can be costly and time-consuming. Self-report measures such as survey tools tend to be more feasible for these reasons. Further study is necessary to explore more objective measures of behavior change in real world primary care settings.
To measure outcomes, retention of study participants is also important. In this review, most studies provided incentives to participants for completing assessments and participating in the research in general, although several studies did not discuss incentives in their publications. Two studies provided incentives to PCPs participating in the research in the form of reimbursement for services and even bonuses for primary care practices maintaining certain rates of retention. With no direct comparison, it’s difficult to conclude whether the incentives for providers had an effect on study outcomes. It does raise a question, however, that if money were available for incentives would using that money to incentivize participants or providers be more effective in terms of outcomes?

The use of incentives is not necessarily representative of real-world primary care practices that may have limited to no funds or resources to distribute to patients for attending clinic visits or programs. In comparison to studies that do provide incentives such as large clinical trials, these real-world practice settings may see lower enrollment and retention of patients. Other challenges and barriers to treatment can also influence retention in real-world practice settings, including family motivation and engagement, transportation, and family schedules. Additional research in real-world primary care practice settings is critical for determining the effectiveness of treatment interventions.

**Conclusion**

Childhood obesity is a significant concern for the health of children in the US. The primary care setting is an appropriate and important setting for children and families to receive screening, prevention, and treatment for obesity in partnership with a trusted and knowledgeable care provider. It is clear, however, that PCPs cannot be the sole providers of childhood obesity treatment. Support from additional health care professionals is necessary,
particularly those trained in behavior modification and MI, to provide more contact time with children and families.

Focusing interventions on behavior change outcome measures will also likely be more effective than focusing on weight or BMI change for Stage 1 and Stage 2 treatment. Achieving the number of contact hours suggested to have an impact on BMI will be difficult in the primary care setting, especially since the current health care system is not conducive to reimbursement of health care providers for childhood obesity treatment. It may also be challenging for families to meet the expectations associated with increased contact hours that require significant amounts of time and frequent transportation. Utilizing other health care professionals and technology to support treatment may be solutions to address some of these concerns in the primary care setting. Finally, because most research has only studied individual stages, significant research is needed to determine whether the staged treatment approach proposed by the Expert Committee is effective and feasible for health care systems and communities to sustain.

References


CHAPTER 3. CHILDHOOD OBESITY TREATMENT IN IOWA: PRIMARY CARE PROVIDERS’ CURRENT PRACTICES, BARRIERS, AND NEEDED IMPROVEMENTS

Modified from a paper to be submitted to Childhood Obesity

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Abstract

Background: Primary care providers (PCPs) are at the forefront of addressing childhood obesity. The development of the Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity prompted a need to determine resources to assist PCPs in following the 2007 Expert Committee recommendations for a staged treatment approach. The purpose of this study was to assess Iowa PCPs’ current practices, barriers, and needed improvements for childhood obesity treatment. Methods: Iowa PCPs were invited to participate in a survey adapted from the National Survey of Energy Balance-Related Care Among Primary Care Physicians developed by the National Cancer Institute. Surveys were distributed to a pediatric conference, educational lectures, medical associations, and practice groups. Data were analyzed using frequency distributions and chi-square analysis. Results: Surveys were completed by 78 PCPs. Regarding current clinical practices, 63% of surveyed PCPs reported always or often using a screening tool to assess patients’ eating and physical activity behaviors. However, only 41% reported always or often tracking or following these behaviors. PCPs identified their top treatment barrier as not having enough time and their top
needed improvement as better counseling tools to guide patients toward lifestyle
modification. **Conclusions:** PCPs in Iowa are following some of the 2007 Expert Committee
recommendations, such as screening and providing guidance related to eating and physical
activity behaviors. However, PCPs are not regularly tracking or following these behaviors
nor regularly using patient-centered communication such as motivational interviewing.
Additional training and tools are needed to help PCPs facilitate treatment of childhood
obesity.

**Introduction**

Primary care providers (PCPs) have an important role in the assessment and treatment
of childhood obesity. Recommendations from the 2007 Expert Committee include
assessment of body mass index (BMI) as well as medical risk, behavior risk, and motivation
or concern.\(^1\) Additionally, a staged treatment approach involving increasing levels of
intervention and additional health care providers was proposed. Stage 1 and Stage 2
treatment often occur in primary care settings or in partnership with community resources,
while Stage 3 and Stage 4 treatment often occur in tertiary care settings.

Previously, surveys with PCPs have explored childhood obesity treatment at the
national level and at the state level in a few particular states. However, it is not known to
what extent PCPs in Iowa are following the Expert Committee recommendations and what
barriers or needed improvements for childhood obesity treatment might exist. In recognizing
that obesity in childhood tracks into adulthood, it is important to address obesity early in
life.\(^2\) Iowa has the 7th highest rate of adult overweight and obesity in the United States (US)
at 69%.\(^3,4\) Additionally, 30% of 10-17 year olds and 32% of 2-4 year old WIC participants in
Iowa have overweight or obesity.\(^5,6\)
In March 2017, the *Iowa Clinician's Guide to Prevention, Assessment & Treatment of Childhood Obesity* was released to PCPs throughout Iowa. The guide was developed in collaboration between the Iowa Chapter of the American Academy of Pediatrics, the Iowa Medical Society, the Iowa Department of Public Health, and the Iowa Academy of Family Physicians. The guide ([https://iowamedical.org/iowa/Childhood_Obesity/Toolkit.aspx](https://iowamedical.org/iowa/Childhood_Obesity/Toolkit.aspx)) (Appendix C) outlines recommendations from the Expert Committee report for assessment and treatment of obesity, including patient-centered counseling techniques. In conjunction with the release of the *Iowa Clinician’s Guide*, a survey was conducted to assess Iowa PCPs current practices, barriers, and needed improvements for childhood obesity treatment.

**Methods**

**Participants**

PCPs in Iowa were invited to complete a survey via paper format or online through Qualtrics between April and September 2017. The survey was distributed at an annual state pediatric conference for physicians and nurses, at continuing education lectures for PCPs, as well as to state-level medical associations and practice groups. This study received Institutional Review Board (IRB) approval from Iowa State University (IRB ID 17-174) (Appendix A).

**Survey**

The survey was adapted from the National Survey of Energy Balance-Related Care Among Primary Care Physicians developed by the National Cancer Institute (Appendix B). Questions were added pertaining to: exposure to and planned use of the *Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity*; utilization, self-efficacy, and attitudes related to motivational interviewing (MI) and brief action planning (BAP); and perceptions of Registered Dietitian Nutritionists (RDNs) in pediatric weight
management. The survey included a total of 25 questions and was estimated to take approximately five minutes to complete. Nineteen questions were on a 5-point Likert-type scale. Questions related to current practices queried PCPs how often they performed each practice. Questions related to attitudes and self-efficacy asked PCPs how strongly they agreed with each statement. PCPs were also asked to identify from a list the types of health care professionals they partner with for Stage 1 and Stage 2 treatment, as well as the top three barriers and top three needed improvements for Stage 1 and Stage 2 treatment. PCP characteristics related to the provider type and the county in which they practiced were obtained.

**Data Analysis**

Frequency distributions were completed for all questions. Likelihood ratio chi-square was used to examine differences among primary care clinicians (i.e., pediatricians, family physicians, physician assistants, nurse practitioners) and residents (i.e., pediatric and family medicine residents) for current practices, attitudes, barriers, and needed improvements. Results were considered to be significant at $p < 0.05$. Data analysis was completed using SPSS (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.).

**Results**

Responses were received from 98 providers. Surveys were excluded that did not identify provider type ($n = 5$), that were completed by non-primary care providers (e.g., dental practitioners; $n = 12$), and that were completed by medical students ($n = 3$) in order to focus on habits of practice in primary care. A total of 78 surveys were included in the analysis.
Survey respondents were mostly pediatricians (56%), nurse practitioners (13%), and pediatric or family medicine residents (18%) (Table 3.1). The majority of PCPs (92%) reported practicing in metro counties in Iowa, as defined by the US Department of Agriculture Economic Research Service 2013 Rural-Urban Continuum Codes. Most PCPs (83%) reported they were extremely or somewhat likely to use the Iowa Clinician’s Guide.

With regards to current practices, 63% of PCPs reported always or often using a screening tool to assess patients’ eating and physical activity behaviors at well-child exams for patients 2 years and older (Table 3.2). There was a statistically significant association between provider group (primary care clinicians and residents) and use of a screening tool, \( \chi^2 = 14.535, p = 0.006 \) (Figure 3.1). However, only 41% of PCPs reported always or often systematically tracking or following patients over time with regards to behaviors or other measures of diet, physical activity, or weight.

The vast majority of PCPs reported always or often providing patients with specific guidance related to diet and nutrition (91%) and physical activity (85%). There was a statistically significant association between provider group (primary care clinicians vs. residents) and providing specific guidance for diet/nutrition \((\chi^2 = 12.638, p = 0.002)\) (Figure 3.2) and physical activity \((\chi^2 = 19.282, p < 0.0005)\) (Figure 3.3). Practices that were reported less frequently by PCPs included utilization of MI and/or BAP (33% always or often), as well as referral to care coordinators (21% always or often), RDNs (14% always or often), or community-based services or programs (11% always or often). However, about half of the PCPs reported partnering with RDNs (53%) and care coordinators (47%) for Stage 1 and Stage 2 treatment. Most PCPs (86%) reported they strongly or somewhat agreed that they were confident RDNs could help improve patient outcomes for pediatric weight
management. Additionally, 78% of PCPs reported they would always or often refer to RDNs if there were not barriers such as insurance coverage and reimbursement.

Most PCPs strongly or somewhat agreed there are effective strategies for healthy diets (81%), physical activity (83%), and healthy weight (80%) (Table 3.3). Similarly, many PCPs strongly or somewhat agreed MI and/or BAP are effective counseling strategies (77%). Most PCPs also strongly or somewhat agreed they were confident in counseling for healthy diets (86%), physical activity (91%), and healthy weight (84%). However, fewer PCPs (58%) strongly or somewhat agreed they were confident in their ability to utilize MI and/or BAP.

The top three barriers to providing Stage 1 and Stage 2 treatment identified by PCPs were: not enough time (69%); patients not interested in improving diet, physical activity, or weight (58%); and lack of adequate referral services for diet, physical activity, and weight (49%) (Table 3.4). The top three improvements PCPs identified to assist them in providing Stage 1 and Stage 2 treatment were: better counseling tools to guide patients toward lifestyle modification (65%); better tools to communicate diet, physical activity, or weight problems to patient or family (51%); and easy-to-understand patient management guidelines (38%) (Table 3.5). Both provider groups (primary care clinicians and residents) identified the same top three barriers and needed improvements.

Discussion

The results of this survey suggest that while many PCPs in Iowa regularly use a screening tool for lifestyle behaviors (63%), far fewer (41%) are regularly tracking or following these behaviors over time. The 2007 Expert Committee recommends assessing modifiable lifestyle behaviors at each well-child visit, at a minimum. Yet the results of this survey are similar to results at the national level that found only 42% of PCPs regularly track or follow these behaviors.
Additionally, PCPs in Iowa reported providing specific guidance on physical activity similarly to PCPs nationally (85% versus 87%, respectively; always or often responses). However, Iowa PCPs reported providing specific guidance on diet and nutrition more often than PCPs nationally (91% versus 83%, respectively; always or often responses). While PCPs in Iowa are giving patients and families specific guidance related to these lifestyle behaviors, they are not regularly utilizing patient-centered communication strategies such as MI, which is also recommended by the 2007 Expert Committee. Similarly, Iowa PCPs seem confident in what behaviors to counsel their patients on, but are less confident in utilizing MI/BAP. PCPs reported not having enough time and needing better counseling tools to guide patients toward lifestyle modification (e.g., tools for MI, BAP, or goal setting) to provide Stage 1 and Stage 2 treatment. These findings suggest that PCPs in Iowa need additional support, resources, and training to provide childhood obesity treatment.

Identifying ways to support Iowa PCPs in facilitating childhood obesity treatment is critical moving forward. The results of this survey indicate there may be differences in current practices of primary care clinicians compared to residents, such as residents less frequently utilizing screening tools for eating and physical activity behaviors, and less frequently providing specific guidance on diet/nutrition and physical activity. Residents may need additional training with regards to assessment and treatment of childhood obesity. While residents reported confidence in their ability to counsel on diet/nutrition and physical activity (86% and 93%; strongly or somewhat agree), none of the residents strongly agreed they were confident in their ability to use MI, with most (71%) reporting they somewhat agreed. Residents also reported infrequent utilization of MI, with only 14% reporting that they often use MI and none reporting they always use MI.
Similar results have been found at the national level. A 2013 survey of pediatric residents found that most residents had high ratings of their ability to assess overweight and obesity and provide counseling on nutrition, physical activity, and screen time (74-87% rating their ability as very good or excellent). However, only 52% provided similar ratings of their ability to use MI and 54% wanted more MI training. Additionally, only 35% responded that they were very comfortable using behavior change techniques for obesity treatment and 40% were very comfortable monitoring behavior change goals. Just 22% believed their own counseling for obesity treatment was very effective.

Another reason it is critical to support Iowa PCPs in providing childhood obesity treatment is because the shortage of PCPs in Iowa is expected to grow by 2030, requiring a 5% increase in the number of primary care physicians in the state to maintain current levels of practice. Additionally, the population to PCP ratio in Iowa is higher than the national average (1507:1 vs. 1463:1, respectively). In 2016, Iowa ranked 35th in the US in active primary care physicians per 100,000 individuals. With a shortage of PCPs, those currently practicing in Iowa may have even less time to spend with patients. Hence, the amount of time PCPs have to conduct behavior change counseling may become even less, requiring counseling to be more efficient and/or to be carried out in partnership with supporting staff.

Training and resources for PCPs and residents that utilize efficient and easy-to-use assessment and counseling tools will be important for addressing childhood obesity in Iowa. The *Iowa Clinician’s Guide*, developed just prior to administration of this survey, is one example of a resource that may be beneficial for PCPs and 83% of PCPs indicated they were likely to use the guide. Additionally, the results of this study helped inform the need for
resources related to patient-centered counseling. Recently, the Healthy Habits Toolkit for Pediatric Primary Care (http://ims.informz.net/IMS/data/images/Documents/5210_PROVIDER.pdf) was developed and released in Iowa, providing a systematic and structured approach to facilitate discussions with parents and children around lifestyle behaviors and goal setting using MI and BAP. Furthermore the recent launch of the Healthy Choices Count (http://www.iowahealthieststate.com/resources/individuals/5210/healthcare-trainings/), a health-focused movement based on the 5-2-1-0 messaging by the Healthiest State Initiative in Iowa, provides an opportunity to capitalize on momentum for change within the state at multiple environmental levels.\textsuperscript{12}

This study is not without limitations, including the relatively small sample size of 78 PCPs. However, surveys with PCPs in other states such as Louisiana and Oklahoma, have seen similar numbers of respondents.\textsuperscript{13,14} Additionally, comparisons of the responses from primary care clinicians and residents was limited due to the small resident sample size ($n = 14$).

**Conclusions**

The findings of this study indicate that PCPs in Iowa are following some of the recommendations of the 2007 Expert Committee for childhood obesity treatment, such as screening and providing guidance related to eating and physical activity behaviors. However, PCPs are not regularly tracking or following these behaviors and are not regularly using patient-centered communication such as MI. PCPs identified having a lack of time and a need for better counseling tools to conduct childhood obesity treatment. Additionally, differences in practices between primary care clinicians and residents may indicate more training is needed for residents to conduct childhood obesity treatment. Further study in Iowa
will be important to examine the impact of a statewide childhood obesity initiative, as well as a shortage of PCPs, on childhood obesity treatment in primary care.

Acknowledgements

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Authors’ Contributions

MMW, JRK, JG, and LLF all contributed to the protocol and survey design. MMW, JG, and BD collected the data. MMW, BD, and RF analyzed the data. MMW drafted the manuscript. MMW and LLF edited the manuscript. All authors reviewed the final manuscript.

Author Disclosure Statement

No competing financial interests exist.
Tables and Figures

Table 3.1 Survey participant provider types.

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatrician (MD/DO)</td>
<td>44</td>
<td>56</td>
</tr>
<tr>
<td>Nurse Practitioner (DNP/NP)</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Pediatric Resident (MD/DO)</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Family Physician (MD/DO)</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Family Medicine Resident (MD/DO)</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Physician Assistant (PA)</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>78</td>
<td>100</td>
</tr>
<tr>
<td>Practice</td>
<td>Always</td>
<td>Often</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>At well-child exams for patients 2 years of age and older, how often do you utilize a screening tool to assess patients’ eating and physical activity behaviors? (e.g., Healthy Habits Questionnaire)</td>
<td>44%</td>
<td>19%</td>
</tr>
<tr>
<td>How often do you provide specific guidance on diet/nutrition (e.g., “Eat more fruits and vegetables” or “Increase your calcium”)?</td>
<td>37%</td>
<td>54%</td>
</tr>
<tr>
<td>How often do you provide specific guidance on physical activity (e.g., “Increase your exercise by walking daily”)?</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>How often do you utilize motivational interviewing and/or brief action planning when providing counseling for changing diet, physical activity, or weight?</td>
<td>7%</td>
<td>26%</td>
</tr>
<tr>
<td>How often do you refer patients to a care coordinator?</td>
<td>3%</td>
<td>18%</td>
</tr>
<tr>
<td>How often do you refer patients to a Registered Dietitian Nutritionist?</td>
<td>1%</td>
<td>13%</td>
</tr>
<tr>
<td>How often do you refer patients to a community-based service or program?</td>
<td>1%</td>
<td>10%</td>
</tr>
<tr>
<td>How often do you systematically track/follow patients over time concerning behaviors or other measures of progress related to diet, physical activity, or weight?</td>
<td>6%</td>
<td>35%</td>
</tr>
</tbody>
</table>

*a. Qualifying statement: “For your child/adolescent patients who have an unhealthy diet, are insufficiently active, are overweight (BMI ≥ 85th percentile), or are at risk for weight-related chronic disease.”*
Table 3.3 Childhood obesity treatment-related attitudes of primary care providers in Iowa.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Somewhat Agree</th>
<th>Neither Agree Nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are effective strategies and/or tools to help patients eat a healthy diet.</td>
<td>38%</td>
<td>43%</td>
<td>5%</td>
<td>10%</td>
<td>4%</td>
</tr>
<tr>
<td>There are effective strategies and/or tools to help patients be adequately physically active.</td>
<td>39%</td>
<td>44%</td>
<td>8%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>There are effective strategies and/or tools to help patients maintain a healthy weight.</td>
<td>35%</td>
<td>45%</td>
<td>10%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Motivational interviewing and/or brief action planning are effective counseling strategies.</td>
<td>37%</td>
<td>40%</td>
<td>18%</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>I am confident in my ability to counsel my patients to eat a healthy diet.</td>
<td>31%</td>
<td>55%</td>
<td>12%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>I am confident in my ability to counsel my patients to be adequately physically active.</td>
<td>29%</td>
<td>62%</td>
<td>8%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>I am confident in my ability to counsel my patients to maintain a healthy weight.</td>
<td>22%</td>
<td>62%</td>
<td>13%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>I am confident in my ability to utilize motivational interviewing and/or brief action planning.</td>
<td>8%</td>
<td>50%</td>
<td>17%</td>
<td>18%</td>
<td>8%</td>
</tr>
</tbody>
</table>
Table 3.4  Top barriers to providing Stage 1 and Stage 2 treatment.

<table>
<thead>
<tr>
<th>障碍</th>
<th>百分比</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough time</td>
<td>69%</td>
</tr>
<tr>
<td>Patients not interested in improving their diet, physical activity, or weight levels</td>
<td>58%</td>
</tr>
<tr>
<td>Lack of adequate referral services for diet, physical activity, and weight</td>
<td>49%</td>
</tr>
<tr>
<td>Too difficult for patients to change their behavior</td>
<td>27%</td>
</tr>
<tr>
<td>Lack of effective tools and information to give patients</td>
<td>22%</td>
</tr>
<tr>
<td>Inadequate reimbursement</td>
<td>15%</td>
</tr>
<tr>
<td>I am not adequately trained in this area</td>
<td>13%</td>
</tr>
<tr>
<td>Lack of effective treatment options</td>
<td>12%</td>
</tr>
<tr>
<td>Fear of offending the patient</td>
<td>12%</td>
</tr>
<tr>
<td>Inadequate training for myself or my staff related to weight bias</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td>9%</td>
</tr>
<tr>
<td>Too difficult to evaluate and manage</td>
<td>3%</td>
</tr>
<tr>
<td>Not part of my role</td>
<td>1%</td>
</tr>
</tbody>
</table>

Note: Respondents were asked, “Which of the following are the **TOP 3 BARRIERS** to providing Stage 1 and Stage 2 treatment in your practice?”
Table 3.5  Top improvements to assist in providing Stage 1 and Stage 2 treatment.

<table>
<thead>
<tr>
<th>Improvement</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better counseling tools to guide patients toward lifestyle modification (e.g., tools for motivational interviewing, brief action planning, or goal setting)</td>
<td>65%</td>
</tr>
<tr>
<td>Better tools to communicate diet, physical activity, or weight problems to patient or family</td>
<td>51%</td>
</tr>
<tr>
<td>Easy-to-understand patient management guidelines</td>
<td>38%</td>
</tr>
<tr>
<td>Better reimbursement for counseling</td>
<td>34%</td>
</tr>
<tr>
<td>Better mechanism to connect patient to specific referral services</td>
<td>31%</td>
</tr>
<tr>
<td>More training for you in evaluating and managing patient diet, physical activity, and weight</td>
<td>23%</td>
</tr>
<tr>
<td>Better information systems to identify appropriate referral services</td>
<td>16%</td>
</tr>
<tr>
<td>More training for your staff in evaluating and managing patient diet, physical activity, and weight</td>
<td>14%</td>
</tr>
<tr>
<td>Better information systems to document and track goals in the medical record</td>
<td>13%</td>
</tr>
<tr>
<td>Ways to more easily identify problems with diet, physical activity, and weight</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>5%</td>
</tr>
</tbody>
</table>

Note: Respondents were asked, “Which of the following are the **TOP 3 IMPROVEMENTS** that could assist you in providing Stage 1 and Stage 2 treatment?”
Figure 3.1 Utilizing screening tools to assess eating and physical activity behaviors by provider group.

Figure 3.2 Providing specific guidance on diet/nutrition by provider group.
Figure 3.3  Providing specific guidance on physical activity by provider group.

References


CHAPTER 4. PRIMARY CARE PRACTICE-BASED FRAMEWORK FOR
CHILDHOOD OBESITY TREATMENT UTILIZING HEALTH COACHING AND A
BEHAVIORAL SCREENING TOOL: THE MY HEALTH, MY WAY! PILOT
STUDY

Modified from a paper to be submitted to Childhood Obesity

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2Blank Children’s Hospital, UnityPoint Health, Des Moines, IA

Abstract

**Background:** Childhood obesity treatment recommendations promote utilization of screening tools, motivational interviewing, and support staff to facilitate treatment through a staged approach. The purpose of the My Health, My Way! (MHMW) pilot study was to determine the effectiveness of a primary care practice-based framework for childhood obesity treatment on behaviors related to nutrition, physical activity, sleep, and screen time.

**Methods:** Families of patients at a primary care practice in the Midwest were invited to participate if the child was 5-12 years of age and had a body mass index (BMI) ≥ 85th percentile. Participants were randomized to standard of care (control) or a six-month intervention, which involved monthly health coaching sessions utilizing the Family Nutrition and Physical Activity (FNPA) screening tool. Outcome measures included FNPA score, BMI percentile, and BMI z-score.

**Results:** Thirty-five participants enrolled and 28 (14 per group) completed baseline measures. Out of the participants that completed the study, those in the intervention group had greater increases in FNPA scores compared to the control group, but was not significantly different (4.86 ± 6.28 versus 0.38 ± 4.6; \( p = 0.135 \)). However, the effect size \( (d = 0.88) \) is considered to be large.

**Conclusions:** A primary care practice-based
framework for childhood obesity treatment utilizing health coaching and a behavioral screening tool may be effective for facilitating lifestyle behavior change. Additional study is needed to examine retention of participants in a staged treatment approach.

**Introduction**

In the United States (US), approximately one-third of children experience overweight and obesity.\(^1\) Children with obesity are more likely to become adults with obesity, and may experience co-morbidities including heart disease, stroke, type 2 diabetes, and cancer.\(^2\)–\(^4\) Recommendations for childhood obesity treatment were released in 2007 by the Expert Committee of the American Medical Association (AMA) and included a staged treatment approach beginning in well-child visits with a primary care provider (PCP).\(^5\) The first two stages, Stage 1 and Stage 2, focus primarily on behavior change.

The staged treatment approach has not been widely studied and PCPs have encountered barriers in addressing behavior change with families such as PCPs’ lack of time and resources, as well as patient and family motivation.\(^6\),\(^7\) Some strategies for engaging families in behavior change have been examined including motivational interviewing (MI) and brief action planning (BAP), a self-management technique grounded in MI that seeks to build self-efficacy.\(^8\)

Christison et al. (2014) piloted a primary care-based intervention utilizing brief MI-enhanced conversations and the Family Nutrition and Physical Activity (FNPA) screening tool formatted to be used as a coaching tool.\(^9\) The FNPA was developed as a result of an Academy of Nutrition and Dietetics (formerly American Dietetic Association) evidence analysis project on pediatric overweight and obesity and includes 20 questions (10 constructs) about behaviors related to overweight and obesity. The FNPA has previously been shown to have construct validity and predictive validity relative to body mass index
Christison et al. used the FNPA to facilitate goal setting and action planning in single well-child visits for childhood obesity prevention and found the process to have good patient and provider acceptability. Additionally, mean FNPA score significantly increased by 4.2 points from baseline to six months post-intervention. Parents reported success achieving 68% of primary behavior goals at one month and 46% at six months, however there was no significant change in BMI z-score at 6 months. While this pilot study targeted obesity prevention, the model demonstrates potential for application with respect to behavior change for childhood obesity treatment, as well.

The purpose of the My Health, My Way! (MHMW) pilot study was to determine the effectiveness of a practice-based framework for childhood obesity treatment on behaviors related to nutrition, physical activity, sleep, and screen time. Our hypothesis was that participants in the intervention group would demonstrate significantly greater improvements in obesity-related lifestyle behaviors from baseline to post-intervention.

Methods

Participants

Families of patients at a pediatric primary care clinic in the Midwest were invited to participate in the MHMW study if the child was 5-12 years of age, had a body mass index (BMI) ≥ 85th percentile, and had no co-morbidities requiring follow-up with a specialist, and they were English-speaking. Participants were enrolled between March 2017 and February 2018, and the duration of the study once enrolled was six months.

Participants were randomized (card in sealed envelope) to intervention and control (standard of care) groups using permuted block randomization to promote even distribution of subjects between groups. As per standard of care at this clinic, control families had follow-up growth checks with the pediatrician every three months (i.e., three months and six months
from enrollment) (Table 4.1). Standard of care at this clinic involved assessing lifestyle behaviors using the 5-2-1-0 Healthy Habits Questionnaire\textsuperscript{12} (Appendix J) at well-child visits and follow-up growth checks, as well as setting a behavioral goal with the pediatrician who utilized MI. This study was approved by the UnityPoint Health Des Moines Institutional Review Board (Study Number: IM2017-001) (Appendix D).

**Intervention**

The intervention protocol was based on the Expert Committee staged treatment approach and intervention families began with Stage 1 treatment (Prevention Plus). The intervention included the same schedule of visits with the pediatrician as the control participants (i.e., every three months) to promote behavior change related to items included in the FNPA screening tool. After enrollment, intervention families scheduled a time to return to the clinic for the initial visit with a health coach, typically within a week of the pediatrician visit. Two health coaches were available to support the intervention in the clinic. Health coaches were professional support staff that had previous training and experience in utilizing MI with patients. The health coaches also attended the same health care professional training on BAP. To facilitate the intervention, health coaches followed standardized processes and scripts (Appendix K), as well as a statement of coaching fidelity (Appendix N).

At the initial in-person visit with the health coach, families completed the FNPA screening tool. Using a standardized script, health coaches reviewed the FNPA with the family and then used the FNPA as a menu for change in facilitating BAP. Families identified a change they were interested in making as a goal and then determined specific details to create an action plan (i.e., what, when, where, how often/much). Families then rated their confidence in achieving the plan they had created on a scale of zero to ten. Participants were
considered confident in achieving their plan if confidence was rated as seven or greater. If confidence was rated lower than a seven, follow-up discussion addressed potential barriers or challenges. After further discussion, the action plan was revised to a level the participants were confident they could achieve. Goal sheets were used to document action plans and included a calendar that could be used for self-monitoring (Appendix M). A time to follow-up approximately one month later by phone was documented, as well.

During months one and two, health coaches conducted phone calls with intervention families once per month, typically lasting 15 minutes or less. During these sessions, families reflected on their action plans and then determined if they would like to continue with the same action plans, modify the action plans, or create new action plans. Health coaches again facilitated BAP to create the action plans, assessed confidence, and scheduled a time to follow-up the next month. At month three, participants had a follow-up growth check in the clinic with the pediatrician and an in-person visit with the health coach. Families completed the FNPA and height and weight were measured to assess BMI percentile. Participants who improved their FNPA score from baseline (or decreased BMI percentile) continued monthly health coaching visits by phone for an additional two months. Participants with no change in FNPA score increased the frequency of health coach visits by phone to twice monthly for two months (Stage 2 treatment). At month six, participants had a follow-up growth check in the clinic with the pediatrician, an in-person visit with the health coach, and repeated baseline measures.

**Outcome Measures**

The primary outcome measure was the FNPA (Appendix H), which was completed by the parent at baseline, three months, and six months. Secondary outcome measures included BMI percentile-for-age and BMI z-score. BMI percentile was documented from the
electronic health record at baseline, three months, and six months. BMI z-score was
determined using the Centers for Disease Control and Prevention (CDC) 2000 growth charts
and published age- and sex-specific LMS (lamda-mu-sigma) parameters.\textsuperscript{14} Parent health
literacy was assessed at baseline using the Newest Vital Sign (NVS)\textsuperscript{13} (Appendix I) to
characterize the participants. Incentives such as water bottles and jump ropes were provided
at three months and six months, but were intentionally kept to a minimum to simulate
resources available in real-world primary care settings.

Data Analysis

Baseline participant characteristics were summarized by group with means ± standard
deviation (SD) for continuous variables and frequency distributions for categorical variables.
Independent samples $t$-tests and Mann-Whitney $U$ tests were conducted to determine if the
groups were significantly different at baseline. Mean ± SD was determined for the number of
health coaching sessions completed by the intervention group. Change scores were calculated
for the FNPA (total score and ten subscale scores), BMI percentile, and BMI z-scores from
baseline to six months. Independent samples $t$-tests were conducted to examine the
differences between intervention and control participants that completed the study. Effect
size was calculated according to Cohen.\textsuperscript{15} Differences between groups were considered to be
significant at $p < 0.05$. Data analysis was completed using SPSS (IBM Corp. Released 2016.

Results

A total of 203 children with a BMI $\geq 85^{th}$ percentile and who were English-speaking
were further assessed for meeting inclusion criteria (Figure 4.1). Sixty children were
excluded, 51 families declined to participate, and 57 did not enroll for other reasons (e.g.,
cancelled/no-show to appointment, expressed interest but did not enroll upon follow-up).
Thirty-five families enrolled in the MHMW pilot study and 28 families (14 intervention, 14 control) completed all baseline measures. None of the participant characteristics were significantly different between groups at baseline (Table 4.2). Mean age of child participants was 8.8 ± 2 years in the intervention group and 9.4 ± 2.1 years in the control group. Mean BMI percentile was 96.4 ± 3.2 in the intervention group and 95.8 ± 3.7 in the control group. Groups were evenly distributed by sex (five males and nine females per group) and by BMI category (four with overweight and ten with obesity per group). Baseline mean FNPA scores were 58.6 ± 8.6 for intervention participants and 56 ± 7.3 for control participants. Most parent participants (71%) demonstrated adequate health literacy.

Sixteen participants completed six-month BMI measurements (9 intervention and 7 control). However, only 15 participants completed the six-month FNPA (8 intervention and 7 control). Of the 14 intervention participants that completed baseline measures, the mean health coaching sessions completed prior to six months was 3.8 ± 1.7 sessions. Intervention participant engagement in the program was higher at month 3 and month 6 (in-person visits at the clinic) compared to months one, two, four and five (Figure 4.2).

Among participants who completed six-month measures, the mean FNPA change score was 4.86 ± 6.28 in the intervention group and 0.38 ± 4.6 in the control group, but was not significantly different ($p = 0.135$) (Table 4.3). However, the effect size ($d = 0.88$) was estimated to be large based on Cohen’s definition. There was a significantly greater mean change score on the FNPA subscale of family eating practices (intervention $0.57 ± 0.54$, control $-0.13 ± 0.41$; $p = 0.041$). Change in BMI z-score was not significantly different between groups at six months (intervention $-0.007 ± 0.093$, control $-0.063 ± 0.14$; $p = 0.33$).
Discussion

While the change in FNPA score from baseline to six months was not significantly different between intervention and control, the estimated effect size ($d = 0.88$) is considered to be large. The intervention group mean change in FNPA score from baseline to six months of $4.86 \pm 6.28$ was similar to findings of Christison et al. ($4.2 \pm 5.7$) from baseline to six months during a childhood obesity prevention pilot study. Tucker et al. (2014) also found similar FNPA change scores ($5.4 \pm 6.9$) after a seven week Stage 2 treatment intervention.

No significant change was observed in BMI percentile or BMI z-score between groups at 6 months. However, a significant change was not anticipated due to the duration and total contact time of the study. The 2017 United States Preventive Services Task Force (USPSTF) recommendation statement on screening obesity suggests $\geq 26$ contact hours may be necessary to have an impact on weight status in children and adolescents 6 years of age and older. Estimating total contact time of the MHMW intervention would be five hours or less over the course of six months. However, the main focus of this pilot study was lifestyle behavior change, as opposed to change in weight or BMI, which is recommended by the Expert Committee for Stage 1 and Stage 2 treatment in primary care.

Participants in the intervention group completed more in-person sessions (i.e., baseline, three months, and six months) compared to phone sessions (i.e., months one, two, four, and five). It is not known whether this difference is a result of the format of the session (in-person vs. phone) or perhaps involvement of the pediatrician during sessions in the clinic. Previous research by Lupi et al. (2014) suggested parents believe pediatricians have a central role in identifying and managing childhood obesity. For instance, families in that study noted they would be willing to work with a Registered Dietitian Nutritionist (RDN) if the pediatrician recommended it, but were concerned about the additional time commitment.
Hence, PCP’s involvement in childhood obesity treatment may be important for retention of patients, even if PCPs do not have significant time to conduct the treatment and instead need to partner with other health care professionals. However, it may also be possible participants in the MHMW study were motivated to return to the clinic to fulfill more acute needs, such as completing a school physical, receiving vaccinations, updating prescriptions, or discussing concerns with the pediatrician.

This pilot study has a few limitations. First, this study is limited by the sample size. Of the potential participants that were approached about enrolling in the study, 51 declined to participate and 25 said they were interested but never enrolled (Figure 4.1). In previous research providers have suggested a barrier to childhood obesity treatment is that patients and families are not interested in making lifestyle changes.19–21

The attrition of participants (40%) from enrollment to six months was greater than anticipated. However, similar and even greater levels of attrition (27-73%) have been seen in other childhood obesity treatment studies.22 Most attrition was due to patients lost to follow-up (i.e., not returning to the clinic for scheduled sessions and not returning phone calls to reschedule sessions). Unfortunately several intervention participants were lost to follow-up before completing baseline measures (i.e., FNPA and NVS), which were completed at the first health coaching session.

Due to both low enrollment and attrition of participants, we were not able to examine any differences when participants advanced to Stage 2 treatment versus those that continued with Stage 1 treatment. However, in this pilot study we sought to conduct an intervention in a real-world primary care setting that would likely have limited resources in terms of incentives for patients participating, as well as limited professional staff available to support
a treatment intervention. Previous research has documented similar findings of low enrollment and high attrition in real-world childhood obesity treatment settings and identified a great need for additional research in these settings.22–25

Another factor likely influencing observed outcomes and level of participant engagement in the intervention was the clinic’s current standard of care, which may be a higher standard of care than at other primary care clinics. The pediatrician in this primary care practice already regularly assessed lifestyle behaviors, utilized MI for counseling, and facilitated goal setting with interested patients, all of which are practices recommended by the 2007 Expert Committee recommendations. Previous literature has documented, however, that most PCPs are not tracking/following patient lifestyle behaviors7 and may not utilize MI due to low self-efficacy.26 Therefore exploring the MHMW practice-based framework with a larger sample and in additional clinics will be important to determine if the observed effect is representative of actual target populations or an artifact of a non-representative sample.

Conclusions

The findings of this study suggest that a primary care practice-based framework for childhood obesity treatment utilizing health coaching, brief action planning, and a behavioral screening tool may be effective for facilitating lifestyle behavior change. Although, low enrollment and high attrition of participants in this pilot study make it challenging to determine the potential effectiveness of this framework.

The 2007 Expert Committee recommendation for staged treatment remains an aspirational approach for elevating patients to appropriate levels of intervention in order to facilitate lifestyle behavior change and weight maintenance with growth. However, retaining engaged patients in entry-level treatment (Stage 1) in primary care settings would be necessary prior to advancing patients to higher levels of treatment (Stages 2, 3, and 4) in the
recommended step-wise approach. Further study in multiple clinics with novel strategies to retain patients in real-world primary care interventions is necessary to (1) promote behavior change and long-term improvement of health status in children with overweight and obesity and (2) implement frameworks within health systems to facilitate the staged treatment approach.

Acknowledgements

This work was supported in part by the United States Department of Agriculture National Institute of Food and Agriculture (NIFA) National Needs Graduate and Postgraduate Fellowship (NNF) grant 2012-04169 “Trandisciplinary Graduate Training in Childhood Obesity Using a Socio-ecological Model” and NIFA grant 2016-67032-25010 “A food systems approach to childhood obesity: Summer research experience.” This work is solely the responsibility of the authors and does not necessarily represent the views of the USDA. The authors would also like to acknowledge Dr. Amy Christison for her assistance in developing the pilot study design.

Authors’ Contributions

MMW, JRK, JG, and LLF all contributed to the protocol and study design. MMW, JG, and JRK collected the data. MMW analyzed the data and drafted the manuscript. MMW and LLF edited the manuscript. All authors reviewed the final manuscript.

Author Disclosure Statement

No competing financial interests exist.
Table 4.1  My Health, My Way! study design.

<table>
<thead>
<tr>
<th>Month</th>
<th>Control</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Meet with Pediatrician (in-person)</td>
<td>Meet with Pediatrician &amp; Health Coach (in-person)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Talk with Health Coach (phone)</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Talk with Health Coach (phone)</td>
</tr>
<tr>
<td>3</td>
<td>Meet with Pediatrician (in-person)</td>
<td>Meet with Pediatrician &amp; Health Coach (in-person)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continue Stage 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stage 2</td>
</tr>
<tr>
<td>4</td>
<td>Talk with Health Coach (phone)</td>
<td>Talk with Health Coach (phone)</td>
</tr>
<tr>
<td>5</td>
<td>Talk with Health Coach (phone)</td>
<td>Talk with Health Coach (phone)</td>
</tr>
<tr>
<td>6</td>
<td>Meet with Pediatrician (in-person)</td>
<td>Meet with Pediatrician &amp; Health Coach (in-person)</td>
</tr>
</tbody>
</table>
Table 4.2 Participant characteristics at baseline by group.

<table>
<thead>
<tr>
<th></th>
<th>Intervention (n = 14)</th>
<th>Control (n = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Age (years)</td>
<td>8.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
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<tr>
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<td>5</td>
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<tr>
<td>Female</td>
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<td></td>
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<tr>
<td>BMI Category</td>
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</tr>
<tr>
<td>BMI z-score</td>
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<tr>
<td>FNPA Score</td>
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<tr>
<td>Adequate Literacy</td>
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</table>

No significant differences at baseline.
Table 4.3  Mean FNPA change scores from baseline to six months by group.

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td></td>
</tr>
<tr>
<td>FNPA Score</td>
<td>4.86</td>
<td>.38</td>
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</tr>
<tr>
<td>Family Meals Score</td>
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<td>.95</td>
<td>.13</td>
</tr>
<tr>
<td>Family Eating Practices Score</td>
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<td>.53</td>
<td>-.13</td>
</tr>
<tr>
<td>Food Choices Score</td>
<td>.14</td>
<td>.69</td>
<td>.12</td>
</tr>
<tr>
<td>Beverage Choices Score</td>
<td>.71</td>
<td>.76</td>
<td>.38</td>
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<tr>
<td>Restriction/Reward Score</td>
<td>.57</td>
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<td>.50</td>
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<tr>
<td>Screen Time Score</td>
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</tr>
<tr>
<td>Family Schedule/Sleep</td>
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<td>-.25</td>
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Results are based on two-sided tests assuming equal variances. For each significant pair, the key of the smaller category appears in the category with the larger mean.

Significance level for upper case letters (A, B, C): .05

1. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.
Figure 4.1 CONSORT diagram of participants.
Figure 4.2 Number of intervention participants engaged in sessions by month.

References


CHAPTER 5. WHAT DO LEGOS® AND PUPPIES HAVE TO DO WITH BEHAVIOR CHANGE IN CHILDHOOD OBESITY TREATMENT? A QUALITATIVE ANALYSIS OF ACTION PLANS AND FOLLOW-UP INTERVIEWS FROM A PRIMARY CARE INTERVENTION

Modified from a paper to be submitted to *Pediatrics*

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Abstract

**Background:** A primary care intervention involving a behavioral screening tool and health coaching has demonstrated potential for facilitating lifestyle behavior change in children with overweight and obesity. The purpose of this qualitative analysis was to examine the action plans and experiences of families participating in the pilot study.

**Methods:** Targeted goal areas and action plans (*n* = 90) were documented during monthly coaching sessions. Structured follow-up interviews (*n* = 5) were conducted at the end of the six-month intervention. The frequency of selected goal areas was determined and key themes were identified for action plans and follow-up interviews. **Results:** The goal areas of food choices and child activity were most common. Differences in action plans were observed including the relationship of the action plan to a particular lifestyle behavior, as well as the level of contextual detail present in the action plans. Follow-up interviews highlighted participants’ perspectives on accountability, experiential learning and resources, and benefits
of the intervention. **Conclusions:** Further study is needed to examine this health coaching and brief action planning process and its utility in creating tailored action plans for families.

**Introduction**

Lifestyle behavior change is a central component of childhood obesity treatment. The 2007 Expert Committee recommendations highlight that the main goal of childhood obesity treatment is improving long-term health by establishing healthy lifestyle behaviors.\(^1\) To facilitate behavior change, the Expert Committee recommends using patient-centered communication such as motivational interviewing (MI). However, a common barrier identified by primary care providers (PCPs) is they don’t have enough time to counsel patients and families for lifestyle behavior change as part of childhood obesity treatment, particularly within well-child visits.\(^2,3\) Partnering with other health care professionals and/or utilizing counseling tools and techniques that are feasible to conduct during brief clinic visits or via telehealth may be important options to overcome the barrier of PCPs’ time constraints.

Brief action planning (BAP) is a self-management support technique, grounded in motivational MI, that fosters behavior change and patient self-efficacy through short, structured conversations.\(^4\) BAP has not been investigated widely, particularly within childhood obesity, although the use of action planning in general has been documented in behavior change literature.\(^5\) Christison et al. (2014) explored the use of the Family Nutrition and Physical Activity (FNPA) screening tool\(^6–8\) along with brief, MI-enhanced conversation to facilitate lifestyle behavior goal setting for childhood obesity prevention in the primary care setting during one well-child visit.\(^9\) Participants significantly increased their FNPA scores from baseline to six months and 68% reported achieving their goal after one month.

While BAP can be done in the primary care setting by a PCP, it might be utilized with greater frequency if it was conducted by supporting staff. The general emphasis of lifestyle
behavior change permits health professionals and support staff with diverse backgrounds (e.g., nurses, dietitians, social workers, community health workers, or individuals trained specifically as health coaches) to be involved with conducting BAP in the form of health coaching. Health coaching can be both a framework for behavior change as well as a specific job category. Health coaching involves a collaborative approach in working with a patient to help her/him develop health goals and obtain the knowledge, resources, and self-efficacy necessary to meet those goals.

Previously, the My Health, My Way! (MHMW) pilot study has been described (Chapter 4) and showed potential for facilitating lifestyle behavior change in children with overweight and obesity through a primary care intervention involving a behavioral screening tool and health coaching based on BAP. The purpose of this qualitative analysis was to examine the action plans and experiences of families participating in the pilot study.

**Methods**

**Intervention**

Children 5-12 years of age and at least one parent/caregiver were invited to participate in this study if the child had a body mass index (BMI) $\geq 85^{th}$ percentile, had no comorbidities requiring follow-up with a specialist, and the family was English-speaking. The design of this study has been previously described elsewhere (Chapter 4). Participants were randomized to either the standard of care (control group) or the intervention group. The control group continued with standard of care at this clinic, which is follow-up appointments every three months with the pediatrician, who utilizes a lifestyle behavior screening tool (Healthy Habits Questionnaire$^{12}$), MI, and goal setting with patients. The intervention group also had pediatrician visits at three-month intervals, plus sessions with a health coach once per month for the first three months (Stage 1 treatment) and once or twice (Stage 2 treatment)
per month for the second three months, depending on their progress. This study was approved by the UnityPoint Health Des Moines Institutional Review Board (Study Number: IM2017-001) (Appendix D).

**Health Coaching Sessions**

At baseline, three months, and six months, participants met with a health coach in-person. There were two health coaches available for the program and the same two health coaches were available for the full intervention. Whenever possible, the same health coach worked with a family through all of the health coaching sessions. Both health coaches had previous training in MI and attended the same BAP training. The health coaches also followed standardized scripts (Appendix K) and a statement of coaching fidelity (Appendix N) to guide the BAP process.

At the first health coaching session, parents completed the FNPA screening tool (Appendix H) and the health coach facilitated a discussion with the parent and child about their responses (Figure 5.1). The discussion began with, “Looking at the different topics on this questionnaire, are there one or two of these that you would like to start working on?” These topic areas, henceforth referred to as FNPA goal areas, guided the discussion to develop an action plan. The FNPA includes 20 questions that are divided between ten constructs associated with childhood overweight and obesity, including family meals, family eating practices, food choices, beverage choices, restriction/reward, screen time, health environment, family activity, child activity, and family schedule/sleep routine. For the purpose of this study, goals are defined as the behavioral target (e.g., eating more fruits and vegetables, getting enough sleep, decreasing screen time) while action plans include when, where, and/or how a specific action will take place. However, the terms “goals” and “action plans” were used interchangeably with families during the intervention.
If a family was unsure of a goal area to begin with, health coaches would ask permission to provide a couple of ideas based on FNPA items that had lower scores compared to other items. The health coach and family would then explore an identified topic further, discussing what the family would like to change about that item compared to what they were currently experiencing. The health coach then facilitated the development of action plans, which included what, when, where, and how often/much the child and/or family would carry out a particular action. The family was then asked how confident or sure they were that they could achieve the action plan, rating on a scale of zero to ten. If the family rated confidence as less than seven, the action plan was revisited to determine how they might feel more confident in achieving the plan, modifying as necessary. If the family rated confidence as seven or higher, they were considered to be confident in achieving their action plan. Action plans were documented on participant goal sheets (Appendix M), which also included a simple calendar the family could use for self-monitoring. A follow-up session was then scheduled to take place approximately one month later via phone (for months one, two, four, and five) or in-person (months three and six).

During follow-up sessions by phone, the health coach began the discussion by asking how the action plans went since the last session. The family could then decide if they wanted to continue with the same action plans, modify the action plans, or create new action plans. If the action plans were new or modified, the health coach facilitated discussion of what, when, where, and how often/much the family would carry out a particular action. The family then rated their confidence in accomplishing the action plan and revised the plan, if necessary, to achieve confidence. Action plans were documented and the next follow-up session with the health coach was scheduled.
At months three and six, the sessions were in-person in the clinic and also involved a follow-up appointment with the pediatrician. The parent completed the FNPA prior to meeting with the health coach to review action plan progress and determine next steps and action plans. The health coach shared family action plans, progress, and FNPA scores with the pediatrician. If the FNPA score at three months was higher than baseline or BMI percentile had decreased, the health coach and pediatrician recommended the family continue with once per month health coaching sessions. If there was no improvement in FNPA score, the health coach and pediatrician recommended the family increase to two health coaching sessions per month to provide additional support in working on their action plans.

**Data Collection**

Health coaches documented families’ action plans and corresponding FNPA goal areas for each health coaching session (Appendix L). Families that completed at least one health coaching session were asked if they would be willing to answer a few questions to provide feedback on the program. Structured follow-up interviews were completed either in-person at the end of the six-month study session or over the phone, and were recorded using a digital recorder (Model ICD-PX440, Sony, Tokyo, Japan). The follow-up interviews included the following five questions:

1. What, if anything, did you like about the My Health, My Way! program?
2. What, if any, challenges did you experience while participating in the program?
   (Prompts if needed: For example, having enough time, frequency of appointments, interest of your family, etc.)
3. What do you think would make the program better?
4. What do you think the program could do differently that would help your family be successful with a healthy lifestyle? (Prompts if needed: For example, more frequent
contact with a health coach, more frequent contact with your doctor, communicating by text or email instead of phone, connecting to other resources, etc.)

5. What would you tell another family that is thinking about doing the My Health, My Way! program?

The interview was conducted by a study team member that was not the primary health coach for each family to ensure participants felt comfortable sharing program feedback. Families received a $20 gift card for participating in a follow-up interview.

Data Analysis

A frequency distribution was completed for the ten FNPA goal areas that corresponded to families’ action plans. Action plans were compiled for thematic analysis using template analysis. The follow-up interview recordings were transcribed and analyzed for themes in participant responses.

Results

Action Plans

Nineteen families were randomized to the intervention group and 14 families completed at least one health coaching session. Families created one to three action plans per visit, depending on interest. The most common FNPA goal areas were food choices and child activity (Figure 5.2). These were also the most common FNPA goal areas that families chose to initially target during the first health coaching session.

A total of 90 action plans were documented. Key themes and differences identified among action plans were: (1) the type of relationship to lifestyle behaviors, and (2) the level of contextual detail in an action plan.
Type of relationship to lifestyle behaviors

Two main types of relationships were identified between action plans and lifestyle behaviors: directly related and indirectly related. Some families created action plans that were directly related to practicing a particular lifestyle behavior. For instance:

“Decrease from one bottle to half a bottle of Coke, Dr. Pepper, or Sprite one time per week or less.” (FNPA goal area: beverage choices)

“Go to bed at 9pm two nights a week.” (FNPA goal area: sleep routine)

“Trade strawberry milk for white milk one time a week.” (FNPA goal area: beverage choices)

“Eat a fruit or veggie for a snack four days per week.” (FNPA goal area: food choices)

“Go for at least a one mile walk three nights per week as a family after dinner.” (FNPA goal area: family activity)

Other families, however, created action plans that were less directly related to practicing or achieving a particular lifestyle behavior. These action plans may have been preparatory steps necessary in order to work toward achieving a targeted lifestyle behavior, or may have been strategies utilized to overcome barriers or challenges related to a targeted lifestyle behavior. For instance:

“Find a place for my LEGOs® and move them [off the dining table] within one week. Starting the next week, we will eat at the table two nights per week.” (FNPA goal area: family eating practices)

“Pick out a recipe to make one time each week.” (FNPA goal area: food choices)

“Read after lunch for 30 minutes at least three days per week.” (FNPA goal area: food choices)

“Get Grandma’s recipe for broccoli and cheese and make it once per week.” (FNPA goal area: food choices)

“Make homemade applesauce tomorrow at home.” (FNPA goal area: food choices)
“Turn off the TV at 9:30pm three nights per week and then journal or read a book in bed.” (FNPA goal area: sleep routine)

**Level of contextual detail in action plans**

While most action plans were specific and measurable, the level of contextual detail varied between action plans of different families. Some action plans created by families were highly tailored to the context of their environments and lives. For instance:

“Walk one mile round trip to Grandma’s house every Wednesday.”

“Make grilled cheese, tomato soup, and baby carrots for dinner on Tuesday night after dance.”

“Chase the puppy around the table for as long as he’ll go three times per week.”

“Ride my bike on the sidewalk from the driveway to the tree five times on three days per week.”

“Replace one juice a day with fruit-infused water three days per week.”

Some families created action plans that had less contextual detail. While the action plans were created by a particular family, the plans were general in nature and could have fit several families. For instance:

“Do 45 minutes of physical activity five days per week.”

“Drink two bottles of water per day.”

“Get up by 6:30am five days a week.”

“Eat four servings of fruit and veggies five days per week.”

**Follow-Up Interviews**

Five families participated in follow-up interviews. Common themes from the interviews included accountability, an interest in experiential learning and resources, and perceived program benefit. With regards to accountability, participants mentioned:

“I just felt like it was really helpful to have like an accountability partner to help me reach the goals.”
“I would rather like to have the call once a week. That kind of kept you more on your toes you know.”

“... [our health coach] was calling me monthly just to check in so it was nice to have some accountability.”

Participants also had comments related to opportunities for experiential learning and resources. For example:

“I don’t know, if there was something offered if I didn’t know how to read a label? I think that some families could use a little help with making those good food choices, you know, maybe like a class or something like that for other people that don’t understand reading labels as much.”

“I think [our health coach] did a very good job of providing recipes and ideas and things like that, that when we were struggling with different ways to overcome problems that we were having that she was very good at providing those sorts of things. So I think more resources like that maybe would help, having those more available to all families, not just the ones participating even.”

“Having activities, like if you guys were to put together like some classes, or I don’t know, like the Gray’s Lake - going on a walk, or meeting at a park, cooking classes for adults and for kids, you know nutrition things. Just more of like a community outreach thing.”

Finally, participants described some of their perceived benefits to participating in the program, such as:

“Some people say, ‘I’m going to make a change,’ but they don’t know how to follow through with it. So I feel like you guys have a great system set up to help people reach those goals and stay on task with them as well with the monthly phone calls and stuff.”

“It was very educational to me.”

“It got [my child] very focused on certain aspects that I recognized as bad habits, so she started to recognize them as bad habits and has really started working on them more. Maybe not meeting her goals every time, but I think it’s made her more aware of those things so I think it’s really helped.”

“It gave me good ideas on things that would help me be healthier.”

“I mean, it’s pretty much structured around what you have the capability of doing. I didn’t feel pressured at all by it, but it was nice to have someone there to encourage
you, and give you the monthly phone call. It's in the back of your mind so it helps keep you on track.”

**Discussion**

A few key observations stand out from this pilot study. First, sometimes the route (i.e., action plans) families took did not directly relate to the destination (i.e., targeted behavior change). The action plans of several families weren’t necessarily practicing a particular lifestyle behavior. Instead, the action plans may have been small steps towards achieving a targeted behavior or were strategies to overcome barriers to achieving a targeted behavior. For instance, moving LEGO® off the table in order to be able to eat dinner together as a family; or getting grandma’s recipe for broccoli and cheese in order to encourage a child to try even one vegetable at a meal.

Similarly, some families developed action plans they reported they were confident they could achieve; however, sometimes were not able to accomplish the plan without taking other steps first. In one case, a family created an action plan that was more directly related to the targeted behavior of increasing physical activity. The action plan was, “Jump on the [indoor] trampoline for ten minutes, three times per week.” At the following health coaching session, however, the child reported not being able to pursue the action plan because the trampoline was covered in toys. Another family had created an action plan to “make homemade applesauce tomorrow at home” in order to encourage the child to eat more fruit through involvement in preparing the recipe. However, the family later reported that while they had found a recipe for applesauce, they did not have the ingredients to make the recipe and were unable to complete their action plan.

These observations highlight just a few factors involved in goal setting and action planning. In a 2017 review of self-management goal setting and action planning, Lenzen et al. summarizes goal setting into several phases, including preparation, formulation of goals,
formulation of action plan, coping planning, and follow-up. Based on this framework, it could be argued that the health coaching and BAP in the MHMW study facilitated preparation by using the FNPA to identify topics for goal setting. The formulation of goals and action plans were both facilitated through the BAP process and the documentation on goal sheets. Additionally, follow-up was scheduled to evaluate progress and provide support and accountability. According to Lenzen et al.’s description of goal setting, the piece that may or may not have been addressed with all families was coping planning. It is possible that some families naturally incorporated this process into the creation of action plans based on previous experience or cognitive skills, such as problem solving or self-regulation. Some families may have also shared these barriers with the health coach as part of the action planning discussion. Additionally, while confidence in carrying out the action plan was assessed, some families may not have considered barriers they may encounter or strategies to overcome them.

Another observation in this study was that action plans were often highly personalized and specific to the context of families’ lives, with details about making a specific meal after a specific event (e.g., grilled cheese and tomato soup after dance lessons), getting physical activity as a family by walking to grandma’s house, or involving an important family member, a puppy, in the child’s indoor physical activity during winter in the Midwest. The 2007 Expert Committee recommendations specifically mention tailoring goals and interventions to individual families in order to promote lifestyle behavior change. While this observation is in line with the recommendations, it is not known whether the tailoring is the direct result of the health coaching and BAP process.
The results of this study bring up several questions. Are the differences in action plans reflecting participants’ ability to create personalized and achievable action plans, differences between health coaches, or the brief action planning process? With regards to participants’ ability to create achievable action plans, another question might be whether children and parents have the cognitive skills to plan for behavior change. For instance, executive function is a set of cognitive processes (e.g., inhibitory control, working memory, and cognitive flexibility) involved in managing behaviors with relation to future goals and outcomes. Previous literature has documented that children and adolescents with overweight and obesity have executive function deficits. Executive function is important in self-regulatory processes such as self-monitoring, goal setting, and problem solving. Particularly with regards to problem solving, executive function is likely important for coping planning, as previously discussed. Perhaps executive function might be an additional component to assess and/or address with children and parents in relation to lifestyle behavior change and childhood obesity treatment.

With regards to differences between health coaches, the potential for this concern was minimized by having the health coaches attend the same training on brief action planning and by following standardized scripts and processes. Both health coaches in this study had previous training and experience in utilizing MI, however the MI training may have been different based on disciplines (i.e., Certified Health & Wellness Coach and Registered Dietitian Nutritionist). Although, action plans facilitated by each health coach were on both ends of the spectrum for contextual detail and relationship to the target behaviors. Therefore, the differences in action plans are less likely to be a result of differences in health coaches and may be more reflective of family factors.
Families may be ready and even confident they can change their behaviors, but they may not take into account factors influencing their ability to accomplish and/or maintain those changes. In helping families determine how they will accomplish a goal or action plan, it may be important to assess their readiness for change in two ways: (1) motivation and/or confidence to change, and (2) preparedness to plan for change, anticipate environments, mitigate barriers, and once accomplished, maintain change.

This study was not without limitations. The small sample size of the intervention group ($n = 14$), as well as attrition of study participants as previously discussed (Chapter 4), may have contributed to differences observed in the action plans. While the action plans included in this study include action plans from participants that withdrew or were lost to follow-up, it is not known why some participants did not continue with the intervention. This study also had a small sample size for follow-up interviews ($n = 5$), which were completed by families that had completed at least one health coaching session. It is not known what barriers may have led to the attrition of other participants after enrollment. However, this information would be valuable in order to consider whether barriers could be better addressed by the intervention to improve retention of participants. Finally, while action plans were documented, completion of action plans was not directly measured. Change in FNPA scores from baseline to six months indicates that the intervention may have had a positive impact on reported lifestyle behaviors (Chapter 4). Future work should explore methods to track action plan completion, taking into account partial completion of action plans, as well.

**Conclusions**

This study highlights the process of health coaching utilizing brief action planning for lifestyle behavior change in the primary care setting. Further study is needed to examine this
process and its utility in creating tailored action plans for families. Additionally, more research would be useful to help understand whether the action plans in this study may be a reflection of a component (e.g., executive function) missing from assessment of childhood obesity and behavior change interventions in general.

Acknowledgements

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Authors’ Contributions

MMW, JRK, JG, and LLF contributed to the protocol and study design. MMW and JRK collected the data. MMW and LLF analyzed the data. SV contributed to study interpretation. MMW drafted the manuscript, and MMW and LLF edited the manuscript. All authors reviewed the final manuscript.

Author Disclosure Statement

No competing financial interests exist.
Figure 5.1 MHMW pilot study health coaching process utilizing brief action planning and the FNPA screening tool.
Figure 5.2  Number of action plans created per FNPA goal area.

References


CHAPTER 6. GENERAL SUMMARY AND CONCLUSIONS

Primary care is an important setting for childhood obesity treatment. The 2007 Expert Committee report recommends utilizing a staged treatment approach, beginning with Stage 1 and Stage 2 treatment, that emphasize lifestyle behavior change. Additionally, the Expert Committee recommends patient-centered counseling techniques, such as motivational interviewing (MI), and the involvement of support staff as needed. This dissertation examined lifestyle behavior change in the primary care setting using the staged approach for childhood obesity treatment.

The findings of the Iowa primary care provider (PCP) survey (Chapter 3) indicated that PCPs needed more resources and support in order to facilitate Stage 1 and Stage 2 treatment. While many PCPs reported that they regularly use screening tools for lifestyle behaviors, far fewer were regularly tracking/following these behaviors. PCPs identified their top treatment barrier as not having enough time and identified needs particularly in the area of better counseling tools to help guide patients toward lifestyle behavior change (e.g., MI or brief action planning (BAP)). Further study in Iowa will be important to examine the impact of statewide childhood obesity initiatives such as 5-2-1-0 Healthy Habits Count, as well as the impact of a shortage of PCPs on childhood obesity treatment in primary care.

The outcomes of the My Health, My Way! (MHMW) pilot study (Chapter 4) suggested that a framework utilizing a lifestyle behavior screening tool, the Family Nutrition and Physical Activity (FNPA) screening tool, along with health coaching and BAP may have an effect of lifestyle behavior change. The pilot study has implications for real-world primary care settings because it was conducted with minimal resources and demonstrated some of the challenges of childhood obesity treatment in primary care such as low enrollment and
attrition. Further study with a larger sample size and additional clinics is needed to examine this framework for staged treatment and to explore strategies to retain families participating in the program.

By examining the action plans and follow-up interviews of families participating in the MHMW study (Chapter 5), further insights were gained on the health coaching process involving the FNPA screening tool and BAP. Key themes and differences identified among action plans were related to the action plans’ type of relationship to a particular lifestyle behaviors, as well as the level of contextual detail in action plans. Common themes from the follow-up interviews included accountability, an interest in experiential learning and resources, and perceived program benefit. Additional study is needed to understand whether the action plans in this study demonstrated the ability of health coaching to tailor action plans to a family and their environment, or whether the action plans are a reflection of a component (e.g., executive function) that may be missing from assessment of childhood obesity and behavior change interventions in general. Overall, the MHMW intervention shows promise for helping families achieve lifestyle behavior change that may ultimately impact weight status and overall health.

In health care, providers often define what success is for patients, such as meeting the recommended guidelines or demonstrating compliance with treatment. In the case of childhood obesity, this may be seen as achieving a particular body mass index (BMI) percentile or completing a particular treatment program. Perhaps what may be more important and necessary, though, is to help patients and their families determine how they will be successful, as opposed to what success is. This type of approach may look like more of a guided “choose your own adventure” scenario for families. This approach would help
families decide where to go with improving lifestyle behaviors and health care providers would help them determine how they would get there using techniques like MI and/or BAP. Additionally, this may require a more holistic approach to patient care, looking beyond just treating childhood obesity, but rather promoting self-management of health and wellness more broadly and identifying other factors in behavior change (e.g., cognitive skills).²⁻⁵ While this approach may align with a process such as the one utilized in the MHMW study (Figure 6.1), it may not fit into the specified stages, timeframes, or targeted outcomes currently recommended for childhood obesity treatment. Patient success may likely require allowing the family to navigate the approach in order to meet their needs and expectations, both of which have been identified as key factors influencing satisfaction and attrition in childhood obesity treatment programs.⁶,⁷
Figures

Figure 6.1  MHMW process diagram.

References


APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL: IOWA PRIMARY CARE PROVIDER SURVEY

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515-294-4566

Date: 4/24/2017
To: Maren Wolff
220 MacKay Hall

From: Office for Responsible Research

Title: Barriers to Treatment of Pediatric Weight Management

IRB ID: 17-174

Study Review Date: 4/24/2017

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where:
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- You do not need to submit an application for annual continuing review.
- You must carry out the research as described in the IRB application. Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form. A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. Only the IRB or designees may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

Please be aware that approval from other entities may also be needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.
APPENDIX B.  IOWA PRIMARY CARE PROVIDER SURVEY

Provider Survey: Barriers to Childhood Obesity Treatment

This survey aims to understand providers’ current practices, barriers, and needs related to childhood obesity treatment. You will be asked to answer questions related to your current practices in assessing and treating childhood obesity, as well as your perception of barriers and needs of childhood obesity treatment. The total amount of time to complete the survey would be approximately 5 minutes. You must be 18 years of age or older to participate in this survey.

None of the information collected will be matched to survey respondents and all the information collected will be kept confidential during and after the survey. No names or identifying factors will be included in any reports of the study results. Your participation is completely voluntary and you can stop the survey at any time without penalty or negative consequences. At the end of survey, we will ask for your email address for a drawing. One participant will be selected through the drawing to receive a $25 gift card. Your email address will be collected on a separate sheet without linking to other parts of the data. After the drawing is completed, the sheet of email lists will be destroyed immediately and the email address will not be used as an identifier or linked to any participants. If you want to participate in the drawing, please leave your email address. If you are uncomfortable to participate in the drawing, you can skip the drawing without any penalty or negative consequences.

If you have any questions about this survey or this study, please contact Maren Wolff, MS, RDN, LD (mmwolff@iastate.edu) or Dr. Lorraine Lanningham-Foster (lmlff@iastate.edu). If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, Office for Responsible Research, 2420 Lincoln Way, Suite 202, Ames, IA 50014, 515-294-1516.

We appreciate your participation very much!
I. Current Practices & Beliefs

<table>
<thead>
<tr>
<th>Check one in each row</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At well child exams for patients 2 years of age and older, how often do you utilize a screening tool to assess patients’ eating and physical activity behaviors? (e.g., Healthy Habits Questionnaire)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For your child/adolescent patients who have an unhealthy diet, are insufficiently active, are overweight (BMI > 85th percentile), or are at risk for weight-related chronic disease:

<table>
<thead>
<tr>
<th>Check one in each row</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. How often do you provide general counseling for changing diet, physical activity, or weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. How often do you provide specific guidance on:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diet/Nutrition (e.g., “Eat more fruits and vegetables” or “Increase your calcium”)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Activity (e.g., “Increase your exercise by walking daily”)?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. How often do you utilize motivational interviewing and/or brief action planning when providing counseling for changing diet, physical activity, or weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. How often do you refer patients to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care Coordinator?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Dietitian?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community-based service or program?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How often do you systematically track/follow patients over time concerning behaviors or other measures of progress related to diet, physical activity, or weight?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please indicate how strongly you agree with each of the following statements.

<table>
<thead>
<tr>
<th>Check one in each row</th>
<th>Strongly agree</th>
<th>Somewhat agree</th>
<th>Neither agree nor disagree</th>
<th>Somewhat disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. There are effective strategies and/or tools to help patients:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eat a healthy diet.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>be adequately physically active.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>maintain a healthy weight.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>8. Motivational interviewing and/or brief action planning are effective counseling strategies.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. I am confident in my ability to counsel my patients to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eat a healthy diet.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>be adequately physically active.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>maintain a healthy weight.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10. I am confident in my ability to utilize motivational interviewing and/or brief action planning.</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

II. Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity

In March 2017, the Iowa AAP Committee on Obesity, in collaboration with the Iowa Medical Society and other health care associations, published an Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity (provided with survey).

11. Prior to this survey, have you seen or accessed the Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity?

- □ Yes
- □ No

12. How likely are you to use this toolkit in the assessment and treatment of overweight and obesity in your practice?

- □ Extremely likely
- □ Somewhat likely
- □ Neither likely nor unlikely
- □ Somewhat unlikely
- □ Extremely unlikely
The 2007 Expert Committee Report from the American Academy of Pediatrics recommends a staged treatment approach for children 2 years and older with a BMI > 85th percentile and risk factors. Below is the description of Stage 1 and Stage 2 treatment, as shown in the Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity.

Stage 1 Prevention Plus: Primary Care Office
- 15-Minute Obesity Prevention Protocol
  - Partner with trained nursing staff, dietitian, wellness coach, PT, athletic trainer, or care coordinator for added support and counseling.
  - Follow-up: Tailored to family motivation.
  - Monthly contact
  - 3-6 month office visits with provider.

- Goals: Positive behavior change, weight maintenance or decreased BMI velocity.
- Connect to community resources.

After 3-6 months. No improvement or stabilization in BMI/weight status, advance to Stage 2

Stage 2 Structured Weight Management: Primary Care Office with Support
- 15-Minute Obesity Prevention Protocol
  - Partner with trained nursing staff, dietitian, wellness coach, PT, athletic trainer, or care coordinator for added support and counseling.
  - Follow-up: Tailored to family motivation.
  - Weekly-monthly contact
  - 3 month office visits with provider.

- Goals: Positive behavior change, weight maintenance or decreased BMI velocity.
- Connect to community resources.

13. Which of the following are the TOP 3 BARRIERS to providing Stage 1 and Stage 2 treatment in your practice?

*Rank the top 3 barriers (1, 2, 3):*

______ Not enough time
______ Not part of my role
______ I am not adequately trained in this area
______ Too difficult to evaluate and manage
______ Inadequate reimbursement
______ Lack of adequate referral services for diet, physical activity, and weight
______ Patients are not interested in improving their diet, physical activity, or weight levels
______ Fear of offending the patient
______ Too difficult for patients to change their behavior
______ Lack of effective tools and information to give to patients
______ Lack of effective treatment options
______ Inadequate training for myself or my staff related to weight bias (weight bias can be defined as the inclination to form unreasonable judgments based on a person’s weight)
______ Other (Please specify): ________________________________
14. Relative to your current practice, what are the **TOP 3 IMPROVEMENTS** that could assist you in providing Stage 1 and Stage 2 treatment?

**Rank the top 3 improvements (1, 2, 3):**

- Ways to more easily identify problems with diet, physical activity, and weight
- Easy-to-understand patient management guidelines
- Better reimbursement for counseling
- Better tools to communicate diet, physical activity, or weight problems to patient or family
- Better counseling tools to guide patients toward lifestyle modification (e.g., tools for motivational interviewing, brief action planning, or goal setting)
- More training for your staff in evaluating and managing patient diet, physical activity, and weight
- More training for you in evaluating and managing patient diet, physical activity, and weight
- Better information systems to document and track goals in the medical record
- Better information systems to identify appropriate referral services
- Better mechanism to connect patient to specific referral services
- Other (Please specify): __________________________

*For Stage 1 and Stage 2 treatment, it is recommended to “partner with trained nursing staff, dietitian, wellness coach, PT, athletic trainer, or care coordinator for added support and counseling.”*

15. Which healthcare professionals do you currently partner with for pediatric obesity treatment? **Mark all that apply:**

- Nursing Staff
- Registered Dietitian
- Wellness Coach
- Physical Therapist
- Athletic Trainer
- Care Coordinator
- Other (Please specify): __________________________

16. If insurance coverage and reimbursement was not a barrier or concern, how often would you refer patients with a BMI ≥ 85th percentile to a Registered Dietitian?

<table>
<thead>
<tr>
<th>Check one</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

*Please indicate how strongly you agree with the following statement.*

**Check one**

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Somewhat agree</th>
<th>Neither agree nor disagree</th>
<th>Somewhat disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
</table>

17. I am confident that Registered Dietitians can help improve patient outcomes for pediatric weight management.

| ☐   | ☐   | ☐   | ☐   | ☐   |
18. Please mark your provider type:

- [ ] MD/DO – Pediatrician
- [ ] MD/DO – Pediatric Subspecialist
- [ ] MD/DO – Family Practitioner
- [ ] MD/DO – Other
- [ ] Resident
  - [ ] Pediatric Resident
  - [ ] Family Practice Resident
- [ ] Medical Student (MD/DO)
- [ ] DNP
- [ ] NP
- [ ] NP Student
- [ ] PA
- [ ] PA Student
- [ ] Other (Please specify): 

19. In which county of Iowa is your practice located? 

______________________________
## APPENDIX C. IOWA CLINICIAN’S GUIDE TO PREVENTION, ASSESSMENT & TREATMENT OF CHILDHOOD OBESITY

### Table 4: Signs and Symptoms of Conditions Associated with Obesity, Diagnosis, and Referral Recommendations*

<table>
<thead>
<tr>
<th>Symptoms or Signs</th>
<th>Suspected Diagnosis</th>
<th>Additional Lab Tests</th>
<th>Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolic syndrome</td>
<td>Metabolic syndrome</td>
<td>Fasting glucose, HbA1c, lipids, liver function tests</td>
<td>Endocrinology, Cardiology</td>
</tr>
<tr>
<td>Sleep apnea</td>
<td>Sleep apnea</td>
<td>PSG, pulse oximetry</td>
<td>Pulmonary Medicine, Otolaryngology</td>
</tr>
<tr>
<td>Insomnia</td>
<td>Insomnia</td>
<td>PSG, cardiac monitoring</td>
<td>Psychiatry, Sleep Medicine</td>
</tr>
<tr>
<td>Depression</td>
<td>Depression</td>
<td>Mood disorders inventory, physical exam</td>
<td>Psychiatry</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Anxiety</td>
<td>Mood disorders inventory, physical exam</td>
<td>Psychiatry</td>
</tr>
</tbody>
</table>

### Table 5: Results Guide for Overweight and Obese Pediatric Patients**

<table>
<thead>
<tr>
<th>Tests</th>
<th>Results</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting Deciles</td>
<td>1-15%</td>
<td>No intervention</td>
</tr>
<tr>
<td></td>
<td>16-30%</td>
<td>Referral to Nutritionist</td>
</tr>
<tr>
<td></td>
<td>31-40%</td>
<td>Referral to Dietitian</td>
</tr>
<tr>
<td></td>
<td>&gt;40%</td>
<td>Referral to Psychologist</td>
</tr>
</tbody>
</table>

### Iowa Clinician’s Guide to Prevention, Assessment & Treatment of Childhood Obesity

1. Assess healthy eating, active living behaviors and body mass index (BMI) in children ages 2½ annually.
2. Share prevention messages (p. 4-5).
3. Plot BMI on gender-specific BMI-for-age chart to determine percentiles.
4. Identify risk (Table 2) and comorbidities (Table 4).
5. History and physical exam, blood pressure, appropriate laboratory test and referrals (Tables 3, and 5).
6. Consider impact of social determinants of health and consider limitations and accommodations due to disabilities (physical, intellectual, and cognitive) and social and health care needs in some children.
7. Acknowledge weight stigma and bias in clinic.

### Consistent Prevention Message: 5-2-1-0

- 5 servings of fruits and vegetables a day
- 2 hours of recreational screen time a day
- 1 hour or more physical activity a day
- 0 or less sugar-sweetened drinks

For additional resources, references and acknowledgment, visit: https://www.idph.gov/childhood Obesity/Default.aspx
Pediatric Obesity Prevention and Treatment Algorithm

- Family history, review of systems and physical exams.
- Appropriate lab screening. See Table 3.

Prevention Counseling: Primary Care Office
- Positive reinforcement of healthy behaviors.
- Assess motivation and attitudes.
- Identify problem behaviors and offer solutions from family.
- Deliver consistent evidence-based messages regardless of weight (e.g., 5-2-1-0).
- Activity engaging the whole family.
- Re-evaluate annually.

15 Minute Obesity Prevention Protocol

1. Ask permission to discuss the topic.
2. Share information in an empathetic manner.
4. Assess nutrition and physical activity behaviors.
5. Provide positive reinforcement of behaviors within a range.
7. Provide needed feedback for behaviors not in optimal range.

AGENDA SETTING:
- Assess readiness to change accepting and respecting it is the right time to change (don’t make them resistant).
- Engage and offer to partner with patient and families and make them comfortable and knowledgeable.
- Set 1-2 small specific goals (consider using brief decision making).
- Engage whole family in lifestyle change.

ASSESSMENT:
- Assess confidence in ability to change (consider using confidence scale).
- Elicit benefits, barriers, and solutions.

SUMMARY AND SCHEDULE FOLLOW-UP:
- Summarize goal (if ready to change) and set follow-up (accepts/can’t accept readiness for change).

Management and Treatment Stages for Patients with Overweight or Obesity
- Patients should start at the least intensive stage and advance through the stages based upon the response to treatment, age, BMI, health risks, and motivation.
- Children age <4 years who have obesity should not lose more than 1 pound/month; children and adolescents with obesity should not lose more than an average of 2 pounds/month.
- Augmented obesity-specific family history, review of systems and physical exams.
- Appropriate lab screening. See Table 3.

Stage 1 Prevention Plan: Primary Care Office
- 15-Minute Obesity Prevention Protocol
  - Partner with trained nursing staff, dietitian, wellness coach, physical therapist, athletic trainer, or case coordinator for extended support and counseling.
  - Set goals: Positive behavior change, weight maintenance or decreased BMI velocity.
  - Connect to community resources.

Stage 2 Structured Weight Management: Primary Care Office with Support
- 15-Minute Obesity Prevention Protocol
  - Partner with trained nursing staff, dietitian, wellness coach, PT, athletic trainer, or case coordinator for extended support and counseling.
  - Follow-up: Tailored to family motivation.
  - Monthly contact.
  - 3-6 month office visits with provider.

Stage 3: Comprehensive, Multidisciplinary Program
- Evaluation and follow-up with multidisciplinary team experienced in pediatric weight management.
- 8-12 weekly visits.
- After 3-6 months if the BMI status has not improved, consider advancing to Stage 4.

Stage 4: Intensive Diet and Activity Counseling with consideration of the use of medication and surgery.

Table 1: Weight Category by BMI* Percentile

<table>
<thead>
<tr>
<th>BMI Percentile Range</th>
<th>Weight Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;5th percentile</td>
</tr>
<tr>
<td>Healthy Weight</td>
<td>5th to 85th percentile</td>
</tr>
<tr>
<td>Overweight</td>
<td>85th to 95th percentile</td>
</tr>
<tr>
<td>Obesity</td>
<td>95th to 99th percentile</td>
</tr>
<tr>
<td>Obesity with increased Risk</td>
<td>BMI &gt;100</td>
</tr>
</tbody>
</table>

*Accurate BMI assessment depends on accurate height and weight measurements, which may be difficult to obtain in some children with disabilities and special care needs.

Table 2: Risk Factors for Comorbidities and Future Obesity

<table>
<thead>
<tr>
<th>Personal Risk Factor</th>
<th>Risk Factors from Family History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated blood pressure</td>
<td>Type 2 Diabetes</td>
</tr>
<tr>
<td>Ethnicity: African American, Hispanic, Native American, Asian/South Pacific Islander</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>High cholesterol</td>
</tr>
<tr>
<td>Medications associated with weight gain (steroids, anti-epileptic, antidepressants)</td>
<td>Parents with Obesity</td>
</tr>
<tr>
<td>Acid reflux</td>
<td>Alzheimer’s</td>
</tr>
<tr>
<td>Birth history of SCA or LGA</td>
<td>Family member with early death from heart disease or stroke</td>
</tr>
<tr>
<td>Disabilities</td>
<td>Family member with history of bariatric surgery</td>
</tr>
</tbody>
</table>

Table 3: Laboratory Evaluation Recommendations*

<table>
<thead>
<tr>
<th>Age</th>
<th>BMI</th>
<th>Risk Factors</th>
<th>Action Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-11 years</td>
<td>&lt;65th percentile</td>
<td>N/A</td>
<td>Non-testing recommendations</td>
</tr>
<tr>
<td>10-11 years</td>
<td>65th to &lt;95th percentile</td>
<td>N/A</td>
<td>Consider fasting testing (fasting glucose, ALT and AST)</td>
</tr>
<tr>
<td>12-13 years</td>
<td>95th to 99th percentile</td>
<td>N/A</td>
<td>Consider fasting testing (fasting lipid profile, fasting glucose, ALT and AST)</td>
</tr>
</tbody>
</table>

*Based on multi-system board recommendations outlined by AAP. For AREF, WHO and USPSTF evidence summaries is insufficient to assess the benefits and harms of screening for lipid abnormalities in youth. [source: https://www.aap.org/en-us/professional-resources/legislative-and-regulatory-affairs/Pages/idol.aspx]
APPENDIX D. INSTITUTIONAL REVIEW BOARD APPROVAL: MY HEALTH, MY WAY! STUDY

February 1, 2017

Jennifer Groos, MD
Blank Children's Hospital
Center for Outreach and Advocacy
1200 Pleasant Street
Des Moines, IA 50309

Dear Dr. Groos,

The Institutional Review Board of UnityPoint Health - Des Moines met on January 12, 2017 and approved the following study (including protocol and algorithm, informed consent, child assent form, clinic introduction letter, patient program overview, intake script, questionnaires):

Obesity Prevention Study - Blank Healthy Kids: My Health, My Way!

The board had some questions and concerns during their discussion of the study. These concerns, as outlined below, were emailed to you on January 13, 2017:

Revision to submission documents:
1. IRB Application - Add the other wellness coaches to the study as study personnel
2. Consent: Add a statement to the consent regarding sharing the information, “Information from the study may be used for publication; none of your personal information will be included.”

Additional questions/points of clarification:
1. What is the objective of the study? Is it to create a business plan to increase staffing resources (translators/Spanish speaking wellness coaches)? If not, what do you plan to do with the data?
2. Provide further clarification on the reason why physically disabled subjects are being excluded.
3. What is your definition of physically disabled?

The IRB suggests you expand the study criteria to include non-English speaking subjects/families and physically disabled subjects. Although it may be easier to conduct the logistics of the study when excluding these two populations, the IRB feels that this is an ethical concern and would result in a weaker study if this population is eliminated. The principle of justice in human subject research requires that attention and consideration be given to special groups that might otherwise be excluded from research for convenience sake. The findings of the study may be more meaningful if these groups were included. Please note that this is not a requirement of the IRB but the consensus was to share their concerns with you.

UnityPoint Health - Des Moines is Fully Accredited by the Association for Accreditation of Human Research Protection Programs, Inc.
The Blank Healthy Kids: My Health, My Way! program is a research study being conducted in the Blank Children's Health Clinic with patients ages 5-12 who see Dr. Jennifer Groos.

We are always looking for ways to improve children's health. One way we can do this is through wellness coaching. A wellness coach helps families identify what healthy habits they would like to improve and helps the family set goals to improve those habits.

Research has shown that some health indicators like Body Mass Index, are associated with increased health risks.

These risks can be lessened by improving health habits related to nutrition, physical activity, sleep, and screen time. We are piloting a program of wellness coaching in our clinic to see if it can be successfully implemented. We are also wanting to know if working with a wellness coach shows more improvement of health habits related to Body Mass Index than not working with a wellness coach.

Dr. Groos will visit with you more about this study during your visit today to tell you more about it and to see if you are interested in participating. You do not have to participate if you or your child do not want to.

Blank Children's Hospital
UnityPoint Health

This graphic is adopted from
Let's Go! www.letsgo.org
START

Meet with Dr. Groos
Decide if the My Health, My Way! program is a good fit for your family.

Meet with Health Coach (In-person - 1 hour)
- Fill out survey about your health and family
- Talk about personal goals for the program
- Schedule next visit

MONTH 1

Talk with Health Coach (Phone - 20 minutes or less)

MONTH 2

Talk with Health Coach (Phone - 20 minutes or less)

MONTH 3

Meet with Dr. Groos & Health Coach (In-person - 30 minutes)

You are showing signs of meeting your goals
You need some extra support and help with meeting your goals

MONTH 4

Talk with Health Coach (Phone)

Talk with Health Coach (Phone)

MONTH 5

Talk with Health Coach (Phone)

Talk with Health Coach (Phone)

MONTH 6

Meet with Dr. Groos

Meet with Health Coach (In-person - 1 hour)
- Fill out survey about your health and family
- Talk about personal goals after the program
- Schedule next visit with Dr. Groos
APPENDIX F. MY HEALTH, MY WAY! CONSENT

UnityPoint Health-Des Moines/Blank Children’s Hospital

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

and

AUTHORIZATION TO USE AND DISCLOSE
PROTECTED HEALTH INFORMATION

Title: Blank Healthy Kids: My Health, My Way!
Protocol Number: IM2017-001
Sponsor: None
Investigator: Dr. Jennifer Groos, Lorraine Lanningham-Foster, Ph.D., Maren Wolff, RD, LD, Julia Richards Krapfl, MS

What you should know about research studies:

- This Consent and Authorization Form gives you information about the study. It tells you about the purposes, risks, and benefits of this research study.

- Regular medical care is based on the best-known treatment. The main goal of regular care is to help the individual patient. The main goal of research studies is to learn more so that we can help future patients. You might benefit from being in this study, but we cannot promise this.

- Just like regular care, this research can have side effects. These side effects can be serious or minor.

- You don’t have to be in this research study. You can agree to be in the study now and change your mind later.

- Your regular medical care will not be affected if you decide not to participate in this study, and your doctor’s attitude toward you will not change.

- This is an important form. Please read it carefully. Ask questions about anything you don’t understand or that isn’t clear to you.

- Being in this research study is up to you.
Introduction:

This is a research study. We are inviting you and your child to participate in this study because your child has a Body Mass Index (BMI) at or above the 85th percentile. Increased health risks have been associated with higher BMI values. Improving health-related habits has been shown to decrease these risks and sometimes improve the BMI value.

What is the purpose of this study?

This study will help determine the best way to provide health coaching services to children and families who would like help developing healthier habits. The American Academy of Pediatrics (AAP) has Guidelines for providing assistance to families to help improve their child’s health habits and possibly reduce their child’s BMI. This study will compare a framework for implementing the first two stages of the AAP Guidelines in a primary care setting using a health coach with the standard of care which does not include health coaching.

Who is doing the study?

Dr. Jennifer Groos is in charge of the study at the Blank Children’s Healthy Clinic. Julia Richards Krapfi is the health coach for this study from the clinic.

Iowa State University is helping us with the study. Maren Wolff is a dietician and health coach from ISU who will be working with families also.

Who else will be in the study?

About 60 children and their parents will be in the study.

How long will you be in the study?

If you join the study, you will be in it for about six months.

What will happen to you if you decide to be in this study?

If you decide to be in this study, you will be randomly assigned into one of two study groups--either the control group or the intervention group. Which group you are in will be determined purely by chance, like flipping a coin. You will have a 50/50 chance of being in either group.

Intervention Group

You will set up a separate appointment to meet with a health coach as well as an appointment with your doctor in three months. The health coach appointment will take about an hour.
During this meeting, you will complete some questionnaires, talk about the concerns you have for your child, what habits you would like to improve, and set some goals to help improve your child’s health behavior. You will then set up a time to talk to the health coach on the phone one month later. You will have phone calls with the coach at one and two months after your first meeting. During these calls, you and your child will review the goals you set in your previous meeting, talk about what worked and what didn’t work in reaching those goals over the past month, and set new goals for the next month.

At three months, you will go back to your appointment with Dr. Groos. This will be very much like a normal appointment where your child’s height, weight, temperature, and blood pressure will be measured by the nurse and you will meet with the doctor. You will meet with the health coach as well and complete one of the questionnaires from the first meeting with the health coach. The coach and doctor will review your goals and progress reaching them over the past three months. You will either continue with monthly phone calls for the next two months or increase the number of calls to every two weeks for the next two months based on how you are doing reaching your goals. Changing your habits is hard and some families need more support to reach their goals. At the end of this visit, you will set up the next coaching call and make an appointment with the doctor for three months.

Coaching calls during the next two months will be the same as the past two months. If you need more support in reaching your goals, the calls will be the same as during the past two months but will happen every two weeks. If you do not need extra support, your calls will be every month.

You will return to the clinic three months later (six months after you first enrolled in the study) for a regular doctor visit. At this time you will complete some questionnaires as you did during the first meeting with the health coach. Your doctor’s visit will be similar to the three-month visit. At the end of this visit, your participation in the study will be complete. You will work with Dr. Groos and the health coach to determine the best direction of care for your child after the study.

Control Group

If you are in the control group, you will complete some questionnaires during your visit with the doctor today. You will come back for a follow-up doctor’s visit in three months and in six months. You will complete some questionnaires at these visits also. The visits will be similar to regular doctor’s visits. After your six month visit, you will be done participating in the study. You will have the option to participate in health coaching for six months after the study ends following the same schedule as the intervention group did.

**What are the possible risks of being in the study?**

This study has minimal risk. There is the possible risk is that you or your child may feel uncomfortable answering some of the questions. You do not have to answer any questions.

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Original IRB Approval Date: January 12, 2017
Revision/Amendment Date(s): None
Continuing Review Date(s): December 2017
Expiration Date(s): December 31, 2017
that you don’t want to, and you can quit the study at any time. As part of the study, you may be asked to do some exercise. There is a possible risk of injury from exercise if you attempt too strenuous of exercise too quickly or do not perform an exercise correctly. You will work with your health coach to minimize these risks by adapting the exercise to your ability.

The members of the research team will collect information about you. In order to protect your confidentiality, all participants will have identification code assigned to them. This code will be on all of the questionnaires that you and your child complete. Only the research staff will have access to the questionnaires and to the names that belong to the identification codes. All study information will be kept in locked files in locked offices at the Center for Advocacy and Outreach at Blank Children’s Hospital and at Iowa State University. Any information stored electronically on computers will be on a secure, password protected system at Iowa State University and at Blank Children’s Hospital.

There may be a risk or side-effect that we don’t know about yet. You might develop a new condition or suffer an injury. If you do, you should tell the study doctor immediately.

**What are the possible benefits of being in the study?**

We cannot promise that you will benefit from being in this study. However, possible benefits include improving your family’s health habits and overall health by setting and reaching goals associated with nutrition, physical activity, sleep, screen time, and other health-related behaviors. You will learn how to set goals and create a plan to work toward those goals that you can use after the study is over.

If we find that this framework is successful, it may be adopted for use by the entire clinic or by other pediatric clinics. This would help to improve the health habits of other families.

**What about new information?**

If we find out that your child has a medical condition that would require working with a specialist or that would alter the course of the health coaching framework, we would discuss continuing your participation in the study with you.

If we find out any new information that might affect your decision to stay in the study, we will share it with you.

**What are your choices if you don’t want to participate in this research?**

If you do not want to be in the study, you have other choices for treatment such as working on health habits on your own without a health coach or with non-hospital assistance such as from the YMCA or other community resources. The alternative to being in this study is to not participate.
What about the confidentiality of your medical information?

The members of the research team will collect information about you and your medical condition. This information is called Protected Health Information. The Health Insurance Portability and Accountability Act (HIPAA) requires that institutions have a Policy to protect your Health Information. The Notice of Privacy Practices of this institution is described in a booklet distributed to all patients. We are asking your permission to use your Protected Health Information and share it with others for the purposes of this research study. If we write a report or article about this study or share the study data set with others, we will do so in such a way that you cannot be directly identified.

Who may see, use, and disclose information about you?

- Governmental agencies that have the right to see or review your health information, such as the Office of Human Research Protections and the Food and Drug Administration

The persons who may use your Protected Health Information include the researcher, Dr. Groos and her research staff, the Institutional Review Board and its staff, legal counsel, audit and compliance staff, officers of UnityPoint Health – Des Moines and Iowa State University and other people who need to see the information to help the Study or make sure it is being done correctly. These persons may disclose your Protected Health Information to staff of the entities listed in the next section.

What information about you can be disclosed in this research study?

- Your name, address, telephone number, date of birth, Social Security number and other details about you.
- Your health history and your family health history.
- Results of tests carried out to determine whether you can join the Study such as: your child’s Body Mass Index.
- Results obtained during the Study: your child’s height and weight as well as answers to questionnaires.
- Information in your medical record at Blank Children’s Health Clinic that may be necessary for your participation in the Study.

Is your information protected after it has been disclosed to others?

If your health information is disclosed to someone who is not required by law to keep it confidential, then that information may no longer be protected, and it may be used or disclosed without your permission.

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Can you decide not to authorize the use and disclosure of your Protected Health Information?

Yes. You do not have to authorize the use or disclosure of your Protected Health Information. However, if you do not give this authorization, then you cannot participate in the Study. Your regular medical care will not be affected if you do not participate in this study.

Can you revoke your authorization?

Yes. You may revoke your authorization to allow your Protected Health Information to be used or disclosed at any time by sending a written notice to the principal investigator, Dr. Jennifer Groos, Blank Children’s Health Clinic, 1212 Pleasant St., Suite 300, Des Moines, IA 50309 or the Institutional Review Board Office, 700 East University Avenue, West 597, Des Moines, IA 50316. If you revoke your authorization, you will be withdrawn from the Study and no health information about you will be gathered after that date. However, information gathered before that date may be used or disclosed if it is needed for the Study or any follow-up for the Study.

Can you see your Protected Health Information?

Yes. You may see and copy your information after the Study ends.

Does your authorization have an expiration date?

The authorization to use and disclose your Protected Health Information does not have an expiration date. Your Protected Health Information will be used as long as it is necessary for the Study.

Can your participation in the study end early?

Yes. There are three ways your participation can end early.

1. You can leave the study voluntarily. Being in this study is voluntary. You do not have to be in the study if you don’t want to. You can agree to be in the study now and change your mind later. If you decide to drop out of the study, you will not be penalized in any way. If you want to quit the study, you should talk to Dr. Jennifer Groos, your health coach, or one of the study staff members.

2. Dr. Jennifer Groos can take you out of the study without your permission. Possible reasons for taking you out of the study are:

   Discovering that your child has a medical condition requiring referral to a specialist for treatment or that may interfere with the goals of health coaching.
3. Study staff may end the study early. The researchers may find all they need to know sooner than expected, or they may find that research subjects are being harmed in ways that were not expected.

If your participation in the study ends early, we may ask you to visit the Dr. Jennifer Groos for a final visit. This visit would help determine the best way to continue helping your child. Your regular medical care will not change if you leave the study early.

What about money?

Dr. Jennifer Groos and the research staff are not being paid above their regular salaries to conduct this study.

If you agree to be in the study, we will not pay you for study-related expenses. Your child will receive small health-related incentives at the three and six month visits such as water bottles or jump ropes.

What happens if you are injured or harmed in this study?

If you are injured or harmed in this study, emergency care will be available through UnityPoint Health Des Moines. However, UnityPoint Health Des Moines does not have a policy to pay you if you are injured by being in the study.

No other compensation is being offered by Blank Children’s Hospital or Iowa State University; however, you do not waive any legal rights by signing this consent form.

You and your insurance company are responsible for any emergency care that is a result of participating in this study.

If you think you have been injured because of participating in this research study, you should call Dr. Jennifer Groos at 515-241-8923.

If you are unsure whether something is serious, it is always best to seek emergency help immediately by calling 911 or going to the nearest emergency room.

Any more questions about this research?

If you have any questions about this study, you can call the Principal investigator Dr. Jennifer Groos at 515-241-8923 or the health coach Julia Richards Krapfl at 515-241-3317.
Concerns and complaints

If you have questions about your rights as a research subject or any concerns or complaints about this research project, please feel free to call the Principal Investigator or the health coach at the numbers listed above.

If you would like to talk to someone who is not associated with the research, please feel free to call any of the following.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathryn Karpowicz</td>
<td>Research Subject Advocate</td>
<td>515-263-5483</td>
</tr>
<tr>
<td>Jane Coy</td>
<td>Director of Corporate Compliance Privacy Officer UnityPoint Health - Des Moines</td>
<td>515-241-6039</td>
</tr>
<tr>
<td>UnityPoint Health - Des Moines Institutional Review Board Office</td>
<td></td>
<td>515-263-5551</td>
</tr>
<tr>
<td>UnityPoint Health - Des Moines Compliance Helpline</td>
<td></td>
<td>1-800-548-8778</td>
</tr>
</tbody>
</table>

All calls will be kept confidential.
Required Signature Section

You are not giving up any legal rights by signing this form.
You will receive a signed copy of this form to keep.

For Adults Subjects Capable of Giving Consent & Authorization on their Own Behalf

I consent to participate in the research study described in this form and
I authorize the use and disclosure of my Protected Health Information as described in this form.

<table>
<thead>
<tr>
<th>Name of Subject:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Person Obtaining Consent and Authorization:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

Original IRB Approval Date: January 12, 2017
Revision/Amendment Date(s): None
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Expiration Date(s): December 31, 2017

IRB Study Number: IM2017-001
For Minor Subjects not Capable of Giving Consent & Authorization on their Own Behalf

I consent to my child's participation in the research described in this form and authorize the use and disclosure of my child's Protected Health Information as described in this form.

<table>
<thead>
<tr>
<th>Name of Subject:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Parent or Legal Guardian:</td>
<td></td>
</tr>
<tr>
<td>Relationship to Subject:</td>
<td></td>
</tr>
<tr>
<td>Signature of Parent or Legal Guardian:</td>
<td>Date:</td>
</tr>
<tr>
<td>Person Obtaining Consent and Authorization:</td>
<td>Date:</td>
</tr>
<tr>
<td>Signature:</td>
<td></td>
</tr>
</tbody>
</table>

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APPENDIX G.  MY HEALTH, MY WAY! ASSENT

UnityPoint Health-Des Moines/Blank Children’s Hospital

Blank Healthy Kids: My Health, My Way!
A Assent Form for Minors Age 12 and Above

I was told I can be in a research study. I can say yes or I can say no. I can ask as many questions as I like before I decide.

The study may help doctors learn more about the best way to help kids and families improve their health habits like eating healthy foods, exercising, getting enough sleep, and not spending too much time on electronic devices.

If I am in the study, my parent and I will meet with a health coach. My parent will answer some questions on paper. We will talk about health habits we want to work on and set some goals for the next month. One month and two months after that meeting, the health coach will call us on the phone to talk about how we are doing working on our goals. We will set new goals for the next month.

I will go back to see the doctor three months after the meeting. The visit will be the same as most visits. The doctor will talk to me about how we are doing with our goals. The health coach will also meet with us and my parent will answer some questions on paper. We will set new goals to work on.

If we aren’t having many problems working on our goals, the health coach will call us again in one and two months. If we need more help on reaching our goals, the health coach will call us every two weeks for the next two months.

Three months later, we will go back to the doctor’s office. This visit will be like the last visit. The doctor will talk to us about our goals. My parent will answer some questions on paper. The health coach, my parent, the doctor and I will talk about this being the end of the study and make a plan for how we want work on healthy habits in the future.

I may feel uncomfortable answering some of the questions or talking about my health habits. If I do some exercise too hard or too fast before my body is ready for it, I might hurt myself.

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IRB Study Number: IM2017-001
Being in this study might help me learn new ways to be healthy. I may also learn how to set goals and work toward them. What the doctors learn may help other kids with their healthy habits in the future.

I can say “no” and doctor will not be mad at me. If I say “yes” now, I can change my mind later.

I can talk to my parents and the doctor about the study.

___ YES, I want to be in the study.

___ NO, I do not want to be in the study.

________________________
Name of Child

_________________________    _____________
Signature                          Date

________________________
Name of Investigator Conducting Assent Interview

_________________________    _____________
Signature                          Date

Original IRB Approval Date: January 12, 2017
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Expiration Date(s): December 31, 2017

IRB Study Number: IM2017-001

APPROVED JAN 1 2017
APPENDIX H. FAMILY NUTRITION AND PHYSICAL ACTIVITY (FNPA) SCREENING TOOL

Attachment 4: Subjective FNPA

Thank you for completing the Family Nutrition & Physical Activity Tool!

Instructions: For each question, select the answer category that best fits your child or your family. It is important to indicate the most common or typical pattern for your family, and not what you would like to happen.

### Family Meals

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often / Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often does your child eat breakfast, either at home or at school?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. How often does your child eat at least one meal a day with at least one other family member?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Family Eating Practices

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often / Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. How often does your child eat while watching TV? [Includes meals or snacks]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. How often does your family eat “fast food?”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Food Choices

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often / Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. How often does your family use packaged “ready-to-eat” foods? [Includes purchased frozen or on-the-shelf entrees, often designed to be microwaved]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. How often does your child eat fruits and vegetables at meals or snacks? [Not including juice]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Beverage Choices

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often / Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. How often does your child drink soda pop or sweetened beverages? [Includes regular or diet soda pop, Kool-Aid, Sunny-D, Capri Sun, fruit or vegetable juice, caffeinated energy drinks (Monster/Red Bull), Powerade/Gatorade, etc.]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. How often does your child drink low-fat milk for meals or snacks? [Includes 1% or skim dairy, flavored, soy, almond, etc.]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Restriction/Reward

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often / Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. How often does your family monitor the amount of candy, chips, and cookies your child eats?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. How often does your family use candy, ice cream or other foods as a reward for good behavior?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Attachment 4: Subjective FNPA

### Screen Time.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often/Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. How often does your child have less than 2 hours of &quot;screen time&quot; in a day? [Includes TV, computer, game system, or any mobile device with visual screens]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. How often does your family monitor the amount of &quot;screen time&quot; your child has?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Healthy Environment.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often/Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. How often does your child engage in screen time in his/her bedroom?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. How often does your family provide opportunities for physical activity?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Family Activity.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often/Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. How often does your family encourage your child to be physically active?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. How often does your child do physical activities with at least one other family member?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Child Activity.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often/Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. How often does your child do something physically active when he/she has free time?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. How often does your child participate in organized sports or physical activities with a coach or leader?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### Family Schedule/Sleep Routine.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never/A</th>
<th>Sometimes</th>
<th>Often</th>
<th>Very Often/Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. How often does your child follow a regular routine for your child’s bedtime?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. How often does your child get enough sleep at night?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

The FNPA Tool was developed at Iowa State University by Michelle Ihmels (mihmels@iastate.edu) and Greg Welk (gwelk@iastate.edu) in partnership with the American Dietetics Association.
APPENDIX I.  NEWEST VITAL SIGN (NVS)

![Nutrition Facts](image-url)

**Nutrition Facts**

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>½ cup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servings per container</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount per serving</th>
<th>Calories</th>
<th>250</th>
<th>Fat Cal</th>
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<tr>
<td></td>
<td>%DV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Fat</strong></td>
<td>13g</td>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sat Fat</td>
<td>9g</td>
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<td>Cholesterol</td>
<td>28mg</td>
<td>12%</td>
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</tr>
<tr>
<td>Sodium</td>
<td>55mg</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Carbohydrate</strong></td>
<td>30g</td>
<td>12%</td>
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</tr>
<tr>
<td>Dietary Fiber</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Sugars</td>
<td>23g</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Protein</strong></td>
<td>4g</td>
<td></td>
<td></td>
<td>8%</td>
</tr>
</tbody>
</table>

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

**Ingredients:** Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.
Score Sheet for the Newest Vital Sign
Questions and Answers

READ TO SUBJECT:
This information is on the back of a container of a pint of ice cream.

1. If you eat the entire container, how many calories will you eat?
   Answer: 1,000 is the only correct answer

2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?
   Answer: Any of the following is correct: 1 cup (or any amount up to 1 cup), half the container. Note: if patient answers "two servings," ask "How much ice cream would that be if you were to measure it into a bowl?"

3. Your doctor advises you to reduce the amount of saturated fat in your diet.
   You usually have 42 g of saturated fat each day, which includes one serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?
   Answer: 33 is the only correct answer

4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?
   Answer: 10% is the only correct answer

READ TO SUBJECT:
Pretend that you are allergic to the following substances: penicillin, peanuts, latex gloves, and bee stings.

5. Is it safe for you to eat this ice cream?
   Answer: No

6. (Ask only if the patient responds "no" to question 5): Why not?
   Answer: Because it has peanut oil.

Number of correct answers:

Interpretation
Score of 0-1 suggests high likelihood (50% or more) of limited literacy.
Score of 2-3 indicates the possibility of limited literacy.
Score of 4-6 almost always indicates adequate literacy.
APPENDIX J.  5-2-1-0 HEALTHY HABITS QUESTIONNAIRE

5-2-1-0 Healthy Habits  AGES 2 - 9  MaineHealth  LET'S GO!

We want to know how your child is doing! Please take a moment to answer these questions.

Child's Name: ______________________  Age: __________  Today's Date: ______________________

1. How many servings of fruits and vegetables does your child have a day? ______________________
   (One serving is 1/2 cup of fresh or frozen, the size of a fruit cup, 1 cup of leafy greens, a small salad, or a piece of fruit the size of a tennis ball.)

2. How many times a week does your child eat dinner at the table 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 screen time does your child have each day? (Don't include school work) ______________________

6. Does your child have a TV or keep a tablet or smartphone in their bedroom? ________________

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

8. How much time each day does your child spend being active? ______________________
   (This means they are breathing harder and their heart is beating faster)

9. How many 8-ounce servings of these does your child drink a day?
   ____ 100% juice  ____ Water  ____ Fruit or sports drinks  ____ Whole milk
   ____ Sodas or punch  ____ 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?
    - Eat more fruits and vegetables  - Eat with your family more often  - Eat less fast food/takeout
    - Drink less soda, juice, or punch  - Drink more water  - Be more active – get more exercise
    - Spend less time watching TV or using a tablet/smartphone  - Get more sleep

Please share this form with your provider, then take it home with you. Thank you!  

Turn this over for tips to get started.  

11/17
APPENDIX K.  MY HEALTH, MY WAY! STUDY SCRIPTS

Pre-Visit Reminder Call Script

“Hi (parent/guardian name), this is __________ from __________ Clinic calling to remind you about (child name)’s appointment with Dr. ______ on (appointment date) at (time). Does that appointment still work for your schedule?”

“We also wanted to let you know Dr. ______ may be mentioning a new program the clinic is offering kids and families called ______ Healthy Kids: My Health, My Way! This program helps families develop healthy habits by working one-on-one with a health coach. If this program would be a good fit for your family, Dr. ______ will share more about it at your appointment.”

“We look forward to seeing you and (child name) on (appointment date)!“
Rooming Nurse Script

"As you may have heard about during the reminder call before your appointment today, we are offering a new program here at the clinic for kids and families called _____ Healthy Kids: My Health, My Way! This program is part of a research study to look at the effects of wellness coaching on improving health habits. Here is a little bit of information about the program and Dr. _____ will visit with you more about this study during your visit today to see if you might want to participate.”

Give Clinic Intro Letter to parent.
Dr. ____ Study Intro Script

"I wanted to share a little more with you about a research study called ____ Healthy Kids: My Health, My Way! I’m always looking for ways to help kids and families improve their health and wellness, and one way we’re trying to do that here at the clinic is by offering wellness coaching. A wellness coach helps families identify what healthy habits they would like to improve and helps the family set goals to improve those habits. Research has shown that some health indicators, like Body Mass Index, are associated with increased health risks. These risks can be lessened by improving health habits related to nutrition, physical activity, sleep, and screen time. We will be studying how we can successfully implement this wellness coaching program in the clinic, and if working with a wellness coach shows more improvement of health habits related to body mass index than not working with a wellness coach."

(Review Participant Flowchart with family)

"If you decide to participate, we would schedule you for a visit with one of our wellness coaches. After that you would schedule a time each month to talk with your wellness coach over the phone to see how things are going. In 3 months you would come back to see me and the wellness coach, and depending on how things are going you would continue to talk with your wellness coach 1 or 2 times per month by phone. Then at 6 months you would come back to see me and the wellness coach again in the clinic."

"Because this is a study and we are looking to see the differences between working with a wellness coach or not working with a wellness coach, your family would be randomly assigned to either the intervention group to work with the wellness coach starting in the next month, or to the control group. If you are assigned to the control group you will have the chance to work with the wellness coach about 6 months from now after having two more follow-up visits with me first. However we don’t get to choose which group you are in – it’s almost like flipping a coin."

Does this sound like anything you might be interested in? What questions do you have?

(If interested to participate)

I’m going to introduce you to one of our wellness coaches and they will tell you a little more about the study, have you sign a couple forms to participate, and then let you know when you would be starting the program. Would that be OK?"

(If not interested to participate)

“That’s OK! We do have other options besides the research study to help families with healthy habits. Would you like to hear about any of those? (Offer resources/options to family as needed per standard of care.)"
Health Coach Enrollment/Consent Script

“Hi (child name and parent name), I’m __________, one of the wellness coaches working with Dr. _____ on the My Health, My Way! program. Dr. _____ said you were interested in participating in the study, so I want to tell you a little more about it. In order for you to participate, you will need to sign a consent form saying that you have agreed to participate in the study. I’d like to walk you through the consent form to tell you more about the study.”

(Review Consent Form with parent)

“By signing this form, (parent name) you are giving your consent to participate in the study, as well as permission for (child name) to participate in the study. (Child name) will also give his/her assent, or agreement, to participate in the study. Let’s look at the assent form together, (child name).”

(Review Assent Form with parent)

“After hearing more about the study, do either of you have any questions?”

(If none, or when all questions answered)

“Does this still sound like something you are interested in?”

(Receive verbal consent/assent from parent/child)

“If so, then you can each go ahead and sign the forms in front of you.”

“As was mentioned by Dr. _____ and in the consent form, this study randomly assigns each family to the intervention or control groups. We don’t get to choose which group you are in – it’s almost like flipping a coin. If you are in the intervention group, we will schedule you for your first visit with the wellness coach this month, and a follow-up visit with Dr. _____ in 3 months. If you are in the control group, we will have you complete a couple questionnaires today and schedule a follow-up visit with Dr. _____ in 3 months. You will be able to participate in the same program as the intervention group for six months after the study ends.”

“You will be in the (control/intervention group).”

(If intervention group)

“Let’s get our first wellness coaching appointment setup. It will take about 1 hour.”

(Determine date/time)
“We also need to have you schedule your 3 month follow-up visit with Dr. ____. Let’s take you out to the front desk to get that scheduled.”

(If control group)

“First, I’m going to have you fill out these two questionnaires about your family health behaviors.”

(Give family FNPA and Lifestyle Behavior Checklist and pencils. Leave the room or wait quietly for a few minutes to allow the parent time to complete the forms. Give child activity to do while waiting if applicable.)

“Thank you for completing those! The next questionnaire we are going to go over together. This one helps us understand how well parents can understand some of the nutrition information presented to them.”

(Administer the Newest Vital Sign per instructions.)

“Thank you for completing that questionnaire! That is the end of the questionnaires for today. We just need to have you schedule your 3 month follow-up visit with Dr. ____. Let’s take you out to the front desk to get that scheduled.”
Healthy Kids: My Health, My Way!  Intake Script

Introduction

Meet family in __________. Escort family to conference room in ____________.
Review study with family and what will be happening today.

Thank you again for agreeing to participate in this study! I would like to take a minute to review the purpose of this study and what is expected of you. This study is looking at the best way to provide health coaching services to children and families who would like help developing healthier habits. The American Academy of Pediatrics has Guidelines for providing assistance to families to help them improve their children’s health habits and possibly reduce their child’s BMI. This study will compare a framework for implementing the first two stages of the AAP Guidelines in a primary care setting using a health coach with the standard of care which does not include health coaching.

Today we are going to fill out some questionnaires and talk about your health goals for your child and family. At the end of our visit today, we will set a couple of goals for you and your child to work on over the next month.

What questions do you have so far? (Answer questions.)

Completing Questionnaires

First, I’m going to have you fill out these two questionnaires. These will give us an idea of your family health behaviors and is a starting point for us to look at what you would like to work on.

(Give family FNPA and Lifestyle Behavior Checklist and pencils. Leave the room or wait quietly for a few minutes to allow the parent time to complete the forms. Give child activity to do while waiting if applicable.)

Thank you for completing those! The next questionnaire we are going to go over together. This one helps us understand how well parents can understand some of the nutrition information presented to them and can help guide our goal-setting.

(Administer the Newest Vital Sign per instructions.)

Thank you for completing that questionnaire! Let’s get started with our health coaching.

Identifying Topic Areas

(Using FNPA coaching tool.) Let’s start by looking at the first questionnaire you completed (FNPA). (Review each item with parent and child asking for clarification as needed. Families may provide additional information such as number of times per week, types of beverages/vegetables/fruits. Mark answers on FNPA coaching tool. Notes can be made on regular FNPA as needed.)
Looking at the different topics on this questionnaire, are there one or two of these that you would like to start working on? (Parent and child indicate choices.)

(If parent/child does not care or cannot decide...) Looking at this, I can see that the scores in ____________ may be lower than some of the others. Would any of those be areas you would like to work on?

(If parent needs further help...) What do you think about trying ____________ and ____________ to start? (If parent agrees, continue below. If parent does not agree and cannot decide, continue this process. If parent can still not decide, pick one area to set goals around.)

Exploration of topics

You chose ____________ to work on. Could you tell me more about what is happening with that? (Parent & child answer. Use Motivational Interviewing skills to clarify.) How would you like that to look? If you could change anything about that, what would it be? (Parent and child answer.)

(Repeat for topic 2 if applicable.)

Goal Setting

Would it be ok if we set some goals for the next month?

Looking at (Topic 1), you said you would like _________________. What is one thing you could work on in the next month? (Assist parent and child in refining goal into a SMART goal.) Could you repeat the goal back to me? (Parent/child repeats for ownership and clarification of goal.)

(Repeat for Topic 2 if applicable.)

Set up 1 month call

Now that you have your goals established, we need to set up the one-month phone call. (Refer to calendar.) One month puts us at (Date). The call will last 20 minutes at the most. Is there any time that week that works better for you? (Coordinate call with parent.) Great! I will call you at (Time, Date). Would you like a reminder call the day before? (Make note of parent’s choice.)

Thank you for your participation in our study! Good luck with your goals over the next month and I will talk to you on (date)!
Follow-Up Phone Call Script
(Months 1, 2, 4, 5)

Hello (parent and/or child name), this is (coach name) from the Blank Healthy Kids: My Health, My Way program. Is this still an OK time for our follow-up phone call?

If the answer is no, attempt to reschedule
What day or time would work better for you? (Parent response) Ok, I will call you back on (date) at (time). Our call will last 20 minutes at most.

If the answer is yes, proceed below
Great! Our call today should take no more than 20 minutes.

How did it go with the goal(s) you set the last time we met?
   a) if they completed their goals, recognize/affirm their success.
   b) if the goal was partially completed, recognize/affirm partial completion.
   c) if they did not try to accomplish their goal, say, “This is something that is quite common when people try something new.”

Brief exploration of participant experience working on goals. Questions could include:
   a) What was the best part about working on your goal?
   b) How did you handle that challenge?
   c) What would you do differently next time?

What would you like to do next?
   a) if they want to set new goals, continue below with identifying/exploration of topic areas and goal setting.
   b) They may want to talk about what they learned from their goals. Reinforce learning and adapting the goals using motivational interviewing. Consider continuing with exploration of topics below with goal from previous month if goals were partially or not completed.
   c) Participant may want to increase frequency of first goal. (Ex: current goal was 1 veggie 3 days a week; increase to 2 veggies 3 days a week or 1 veggie 5 days a week.)
   d) Keep same goal.

Identifying Topic Areas
Is there anything you would like to do for your health in the next month? (If parent/child provide response, skip to exploration of topics)

If not for sure
Would it be OK if I shared a couple ideas from the FNPA questionnaire you completed the first time we met? (If parent/child is agreeable) Looking at this, I can see that the scores in ____________ or ____________ may be lower than some of the others. Would any of those be areas you would like to work on?
(If parent needs further help...) What do you think about trying _______ and _______ to start?
(If parent agrees, continue below. If parent does not agree and cannot decide, continue this process. If parent can still not decide, pick one area to set goals around.)

Exploration of topics
You chose _______ to work on. Could you tell me more about what is happening with that? (Parent & child answer. Use Motivational Interviewing skills to clarify.) How would you like that to look? If you could change anything about that, what would it be? (Parent and child answer.)
(Repeat for topic 2 if applicable.)

Goal Setting
Would it be ok if we set some goals for the next month?

Looking at (Topic 1), you said you would like __________________. What is one thing you could work on in the next month? (Assist parent and child in refining goal into a SMART goal.) Could you repeat the goal back to me? (Parent/child repeats for ownership and clarification of goal.)
(Repeat for Topic 2 if applicable.)

Readiness to Change
I wonder how sure/confident you feel about carrying out your plan. Considering a scale of 1 to 10, where 1 means you are not sure at all and 10 means you are very confident or very sure, how sure/confident are you about completing your goals?

a) (if 7) That’s great! It sounds like a good goal for you.
b) (if <7) ____ is great. That’s a lot higher than 0, and shows a lot of interest and commitment. We know that when confidence is a 7 or more, people are more likely to complete their goals. Do you have any ideas about what might raise your confidence to a 7 or more?
• (if they don’t have ideas) Would you like to hear some ideas from other people I’ve worked with? (if yes) Sometimes people cut back on their goals, change their goals, or make a new goal. Do you think any of these work for you or do you have an idea of your own? (if so, repeat goal setting and readiness to change)

Set up next call
**If month 2, remind parents of date/time of follow-up visit in the clinic. Next follow-up call will be set at that visit.
**If month 5, remind parents of date/time of follow-up visit in the clinic.
Now that you have your goals established, we need to set up the next phone call in (per protocol – one month or 2 weeks). (Refer to calendar)

(One month/two weeks) puts us at (date). The call will last 20 minutes at the most. Is there any time that week that works better for you? (Coordinate call with parent) Great! I will call you at (time, date). Would you like a reminder call the day before? (Make note of parent’s choice)

Thank you for your participation in our study! Good luck with your goals and I will talk to you on (date)!
MHMY 3 Month Follow-Up Visits (In-Person)

**Patient/Family Arrival**

*Patient and family are roomed by nursing staff. Nursing staff provides family with Family Nutrition and Physical Activity (FNPA) Survey.*

**Rooming Nurse:** “Dr. ____ would like you to complete a short survey before her visit with you today to explore your family’s health habits.”

*Patient and family complete FNPA.*

**Dr. ____ Visit with Families**

- **Control Families**
  - Dr. ____: “Thank you for filling out this survey today. Let’s talk about how the last 3 months have gone since I saw you last.”
    - Dr. ____ continues with standard of care for growth check visits.
    - Dr. ____ instructs family to schedule growth check visit in 3 months (6 month study visit).
  - **Wellness Coach:** “Thank you for participating in the My Health, My Way study. For your continued participation in the study we have a few items to give you.”
    - Provide incentives for study participation (water bottle, jump rope, pedometer, etc)

- **Intervention Families**
  - Dr. ____: “Thank you for filling out this survey today. Let’s talk about how the last 3 months have gone while you’ve been working on goals with your wellness coach. Tell me about your goals and what has gone well or not so well.”
    - Dr. ____ discusses with family and then continues with standard of care for growth check visits.
  - Dr. ____: “Your coach will be in next to review your goals for the last month and set any new goals you would like going forward.”
    - Dr. ____ leaves patient room and reviews BMI and FNPA with wellness coach.
      - If patient has improved FNPA score from baseline OR has maintained weight OR decreased BMI velocity, patient continues in stage 1 treatment group (once per month coaching calls).
      - If patient has not improved FNPA score from baseline OR has increased weight OR not decreased BMI velocity, patient moves into stage 2 treatment group (twice per month coaching calls).
Wellness Coach Visit with Intervention Families

Wellness Coach: “How did it go with the goal(s) you set the last time we met?”
   a) if they completed their goals, recognize/affirm their success.
   b) if the goal was partially completed, recognize/affirm partial completion.
   c) if they did not try to accomplish their goal, say, “This is something that is quite common when people try something new.”

Brief exploration of participant experience working on goals. Questions could include:
   a) What was the best part about working on your goal?
   b) How did you handle that challenge?
   c) What would you do differently next time?

“What would you like to do next?”
   a) if they want to set new goals, continue below with identifying/exploration of topic areas and goal setting.
   b) They may want to talk about what they learned from their goals. Reinforce learning and adapting the goals using motivational interviewing. Consider continuing with exploration of topics below with goal from previous month if goals were partially or not completed.
   c) Participant may want to increase frequency of first goal. (Ex: current goal was 1 veggie 3 days a week; increase to 2 veggies 3 days a week or 1 veggie 5 days a week.)
   d) Keep same goal.

Identifying Topic Areas

“Is there anything you would like to do for your health in the next month?” (If parent/child provide response, skip to exploration of topics)

If not for sure

“Would it be OK if I shared a couple ideas from the FNPA questionnaire you completed today? (If parent/child is agreeable) Looking at this, I can see that the scores in ______________ or ______________ may be lower than some of the others. Would any of those be areas you would like to work on?”

(If parent needs further help…) “What do you think about trying __________ and __________ to start?”
(If parent agrees, continue below. If parent does not agree and cannot decide, continue this process. If parent can still not decide, pick one area to set goals around.)

Exploration of topics

“You chose __________ to work on. Could you tell me more about what is happening with that? (Parent & child answer. Use Motivational Interviewing skills to clarify.) How would you like that to look? If you could change anything about that, what would it be?” (Parent and child answer)
(Repeat for topic 2 if applicable.)

Goal Setting

“Would it be ok if we set some goals for the next month?
Looking at (Topic 1), you said you would like _______________. What is one thing you could work on in the next month? (Assist parent and child in refining goal into a SMART goal.) Could you repeat the goal back to me?” (Parent/child repeats for ownership and clarification of goal.)

(Repeat for Topic 2 if applicable.)

Readiness to Change

“I wonder how sure/confident you feel about carrying out your plan. Considering a scale of 0 to 10, where 0 means you are not sure at all and 10 means you are very confident or very sure, how sure/confident are you about completing your goals?”

a) (If >7) That’s great! It sounds like a good goal for you.
b) (If <7) ____ is great. That’s a lot higher than 0, and shows a lot of interest and commitment. We know that when confidence is a 7 or more, people are more likely to complete their goals. Do you have any ideas about what might raise your confidence to a 7 or more?

• (If they don’t have ideas) Would you like to hear some ideas from other people I’ve worked with? (If yes) Sometimes people cut back on their goals, change their goals, or make a new goal. Do you think any of these work for you or do you have an idea of your own? (If so, repeat goal setting and readiness to change)

Set up next call & 6 month visit

“Now that you have your goals established, we need to set up the next phone call. Dr. ____ and I discussed planning (once/twice) per month phone calls going forward. Does that sound OK to you?”

(One month/two weeks) puts us at (date). The call will last 20 minutes at the most. Is there any time that week that works better for you? (Coordinate call with parent) Great! I will call you at (time, date). Would you like a reminder call the day before? (Make note of parent’s choice)

Thank you for your participation in our study! For your continued participation in the study we have a few items to give you.”

• Provide incentives for study participation (water bottle, jump rope, pedometer, etc)

“Good luck with your goals and I will talk to you on (date)! Let’s go get your next appointment set up with Dr. ____ for 3 months from now.”
MHMY 6 Month Follow-Up Visits (In-Person)

Patient/Family Arrival

Patient and family are roomed by nursing staff. Nursing staff provides family with Family Nutrition and Physical Activity (FNPA) Survey and Lifestyle Behavior Checklist (LBC).

Rooming Nurse: “Dr. ____ would like you to complete two surveys before her visit with you today to explore your family’s health habits.”

Patient and family complete FNPA & LBC.

Dr. ____ Visit with Families

* Control Families
  - Dr. ____: “Thank you for filling out these surveys today. Let’s talk about how the last 3 months have gone since I saw you last.”
  - Dr. ____ continues with standard of care for 3 month growth check visits.
  - Dr. ____: “This ends the 6 months of your participation in our My Health, My Way study. Your coach will be in next to do one more survey with you and then talk about the next steps if you would like to participate in the wellness coaching program.”
  - Wellness Coach: “Thank you for participating in the My Health, My Way study. We have one more short survey that I will read to you. This one helps us understand how well parents can understand some of the nutrition information presented to them.”
  - Wellness coach conducts Newest Vital Sign (NVS).
  - Wellness Coach: “Thank you for completing this survey. For your participation in the study we have a few items to give you.”
    - Provide incentives for study participation (water bottle, jump rope, pedometer, etc)
  - Wellness Coach: “Since this is the end of the 6 month study period, you now have the opportunity to participate in the wellness coaching program. Would you like to participate?”
    - Review flowchart with families and set up first coaching visit if they would like to participate.

* Intervention Families
  - Dr. ____: “Thank you for filling out these surveys today. Let’s talk about how the last 3 months have gone while you’ve been working on goals with your wellness coach. Tell me about your goals and what has gone well or not so well.”
  - Dr. ____ discusses with family and then continues with standard of care for 3 month growth check visits.
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"Dr. _____: "Your coach will be in next to review your goals for the last month and set any new goals you would like going forward."

Wellness Coach Visit with Intervention Families

Wellness Coach: "Thank you for participating in the My Health, My Way study. We have one more short survey that I will read to you. This one helps us understand how well parents can understand some of the nutrition information presented to them."

- Wellness coach conducts Newest Vital Sign (NVS).

Wellness Coach: "How did it go with the goal(s) you set the last time we met?"
  a) If they completed their goals, recognize/affirm their success.
  b) If the goal was partially completed, recognize/affirm partial completion.
  c) If they did not try to accomplish their goal, say, "This is something that is quite common when people try something new."

Brief exploration of participant experience working on goals. Questions could include:
  a) What was the best part about working on your goal?
  b) How did you handle that challenge?
  c) What would you do differently next time?

"What would you like to do next?"
  a) If they want to set new goals, continue below with identifying/exploration of topic areas and goal setting.
  b) They may want to talk about what they learned from their goals. Reinforce learning and adapting the goals using motivational interviewing. Consider continuing with exploration of topics below with goal from previous month if goals were partially or not completed.
  c) Participant may want to increase frequency of first goal. (Ex: current goal was 1 veggie 3 days a week; increase to 2 veggies 3 days a week or 1 veggie 5 days a week.)
  d) Keep same goal.

Identifying Topic Areas
"Is there anything you would like to do for your health in the next month?" (If parent/child provide response, skip to exploration of topics)

If not for sure
"Would it be OK if I shared a couple ideas from the FNPA questionnaire you completed today? (If parent/child is agreeable) Looking at this, I can see that the scores in __________ or __________ may be lower than some of the others. Would any of those be areas you would like to work on?"

(If parent needs further help…) "What do you think about trying __________ and __________ to start?"
(If parent agrees, continue below. If parent does not agree and cannot decide, continue this process. If parent can still not decide, pick one area to set goals around.)
Exploration of topics
"You chose ___________ to work on. Could you tell me more about what is happening with that? (Parent & child answer. Use Motivational interviewing skills to clarify.) How would you like that to look? If you could change anything about that, what would it be?" (Parent and child answer.) (Repeat for topic 2 if applicable.)

Goal Setting
"Would it be ok if we set some goals for the next month?

Looking at [Topic 1], you said you would like __________________. What is one thing you could work on in the next month? (Assist parent and child in refining goal into a SMART goal.) Could you repeat the goal back to me?" (Parent/child repeats for ownership and clarification of goal.)

(Repeat for Topic 2 if applicable.)

Readiness to Change
"I wonder how sure/confident you feel about carrying out your plan. Considering a scale of 0 to 10, where 0 means you are not sure at all and 10 means you are very confident or very sure, how sure/confident are you about completing your goals?"

a) [if >7] That’s great! It sounds like a good goal for you.

b) [if <7] ______ is great. That’s a lot higher than 0, and shows a lot of interest and commitment. We know that when confidence is a 7 or more, people are more likely to complete their goals. Do you have any ideas about what might raise your confidence to a 7 or more?

• (if they don’t have ideas) Would you like to hear some ideas from other people I’ve worked with? (if yes) Sometimes people cut back on their goals, change their goals, or make a new goal. Do you think any of these work for you or do you have an idea of your own? (If so, repeat goal setting and readiness to change)

"Thank you for your participation in our study! For your participation in the study we have a few items to give you."

• Provide incentives for study participation (water bottle, jump rope, pedometer, etc)

"Good luck with your goals! Let’s go get your next appointment set up with Dr. ______."
MHMW Follow-up Interview Invitation Script (phone or in clinic)

Phone: "Hi (parent's name) this is (interviewer name) from ______ Practice and I'm calling about the My Health, My Way program you participated in.

In-Person: "Hi (parent's name) I'm (interviewer name) and I'm here to chat about the My Health, My Way program you participated in.

Both:
"We are contacting the families that participated in the program to learn more about what they thought of the program through a few follow-up questions. Answering the questions will take no more than 15 minutes and you'll receive a $20 gift card for your time. Participation is voluntary so you don't have to participate and you can skip any questions you don't want to answer. Do you think this might be something you'd be interested in?"

(Parent response yes/no/maybe)

If no:
"That is OK – thank you for your time and for participating in the program!"

If yes/maybe:
"Great! Let me tell you a little more about the process. If you choose to participate, we can go through the questions now if you have time or we can schedule another time. Your responses to the questions will be recorded, if you are OK with that, so we can ensure we get all of your feedback and can compile it with feedback from other families in the program. Your answers will be kept confidential and your name will not be shared with your answers. Our goal is to learn as much as we can from the families that participated in the program so we can hopefully make the program better for other families that might participate in the future. Are you still interested to participate?"

If yes, determine date/time to conduct interview.
If no: "That is OK – thank you for your time and for participating in the program!"
MHW Follow-Up Interview Questions

“Thank you for participating in the My Health, My Way program. We appreciate your honest answers. The feedback you share will help us make the program better for other families that might participate in the future.”

1. What, if anything, did you like about the My Health, My Way program?
2. What, if any, challenges did you experience while participating in the program? (Prompts if needed: For example, having enough time, frequency of appointments, interest of your family, etc)
3. What do you think would make the program better?
4. What do you think the program could do differently that would help your family be successful with a healthy lifestyle? (Prompts if needed: For example, more frequent contact with a health coach, more frequent contact with your doctor, communicating by text or email instead of phone, connecting to other resources, etc)
5. What would you tell another family that is thinking about doing the My Health, My Way program?
APPENDIX L. MY HEALTH, MY WAY! HEALTH COACH DOCUMENTATION FORM

My Health, My Way Wellness Coaching Intake Form

Date:

Child's Name: 

DOB: 

Age: 

Parent/Guardian Name: 

Phone: 

Email: 

Questionnaires:

FNPA Score: 

LBC Score: 

NVS Score: 

FNPA Review: 

Top 2 FNPA Areas to Address:

1. 

2. 

Goals:

1. 

2. 

Confidence Rating:

What would raise that number?

Next Appointment:
APPENDIX N.  MY HEALTH, MY WAY! STATEMENT OF COACHING FIDELITY

_____ Healthy Kids: My Health, My Way!

Statement of Coaching Fidelity

A successful randomized-controlled trial relies on the consistent administration of the procedures for both the intervention and control groups across all participants. In order to ensure a standard approach to the wellness coaching process during this study, the wellness coaches will adhere to the following standards.

- Scripts will be used by the physician and the wellness coaches for study-related interactions with the patients. Scripts are provided for the pre-visit reminder call, the rooming nurse, Dr. _____’s introduction to the study during the visit, enrollment and consenting by the wellness coach, the initial coaching visit, all follow-up phone calls, and the 3-month and 6-month clinic visits.
- Wellness coaching is a tailored, individualized process. Within the script, the coach will use Motivational Interviewing to meet each participating family “where they are at” and to assist them in moving toward their goals. The principals of MI will be adhered to within the framework of the script.
- Dr. _____ and the coaches will have an IRB-approved collection of educational materials to provide to the participants. The materials that are used will vary slightly from participant to participant depending on the needs of the family.
- The wellness coaches will sit-in on each other’s coaching sessions, with the permission of the family, when possible to monitor each other’s approach to coaching.
- The coaches will meet regularly to discuss adherence to MI principals and standardization of the coaching process.
- Video recording the coaching sessions with the family for review for coaching fidelity was not included in the original study design nor was it included in the IRB application. For a small scale implementation study with a limited time frame, the investigators felt that adding this component may discourage families from participating in the study.
- Both wellness coaches have been trained in Motivational Interviewing and Brief Action Planning and have used these skills in previous coaching experiences.