

DISSERTATION

THE HEROs SELF-CARE PROGRAM: TARGETING MATERNAL SELF-CARE IN
OBESITY PREVENTION

Submitted by

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ABSTRACT

THE HEROs SELF-CARE PROGRAM: TARGETING MATERNAL SELF-CARE IN OBESITY PREVENTION

Background: Obesity has continued to be a major health concern for adults and children in the United States, and maternal mindful self-care behaviors related to healthy eating, physical activity (PA), and stress management play an important role in child weight status, especially in early, formative years. Rural mothers, however, face unique barriers to these health behaviors.

Objective: To design a mindful self-care intervention and investigate its feasibility and acceptability for mothers of preschoolers living in rural Colorado with limited resources.

Methods: The Healthy EnviROnments (HEROs) Self-Care program was designed using Intervention Mapping and the Plan-Do-Study-Act (PDSA) model to integrate Social Cognitive Theory, effective behavior change strategies, and tailor the intervention to the audience contexts. The resulting program included 2 group workshops and 4 individual health coaching sessions via videoconferencing with topics on healthy eating, PA, stress management, and goal setting for health. Baseline health measures (weight status, cardiovascular disease (CVD) risk factors, and health behaviors) were gathered on participants ($n = 23$) at 3 health fairs to provide information on the health status of the target audience, and the intervention was piloted with a subsample ($n = 6$) to inform program feasibility (e.g., feasibility of data collection and program implementation). Post-intervention interviews informed program acceptability (e.g., components that functioned well and areas for further refinement).

Results: Audience input informed the development of the HEROs Self-Care program, resulting in a theory-based intervention integrating best practices and consideration for audience-specific barriers to behavior change. The pilot outlined effective intervention strategies such as videoconferencing technology and individual health coaching sessions as well as future areas for refinement like additional healthy eating content and improved integration of mindfulness and digital supports. Baseline health measures did not meet recommendations, further indicating a need for a program to address maternal health.

Conclusion: The HEROs Self-Care program was designed systematically to target maternal self-care as an approach for childhood obesity prevention efforts. Audience feedback and baseline health data supported the need for a maternal self-care intervention within childhood obesity interventions, and the intervention pilot revealed the program to be feasible and acceptable.

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TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	ix
LIST OF FIGURES	x
CHAPTER 1: INTRODUCTION	1
REFERENCES	6
CHAPTER 2: LITERATURE REVIEW	9
Overview.....	9
Section 1: Obesity and Related Health Factors.....	10
1.1. Obesity and Cardiovascular Disease Risk	10
1.2 Childhood Obesity within the Family Context.....	11
1.3 Associations Between Maternal Obesity-related Health Factors and Child Health Outcomes.....	14
Section 2: Self-care and Mindfulness as Strategies for Maternal Health Promotion	22
2.1 Self-care.....	22
2.2 Mindfulness	24
Section 3: Intervention Approaches for Obesity Prevention and Health Promotion in Families.....	26
3.1 The Healthy EnviRONments Study	26
3.2 Health Behavior Interventions.....	28
3.3 Needs Assessments.....	30
3.4 Social Cognitive Theory in Intervention Design.....	31
3.5 Theory-based Intervention Strategies.....	32
3.6 Intervention Design and Refinement.....	37
Section 4: HEROs Self-Care: Study Goal and Objectives.....	40
REFERENCES	42
CHAPTER 3: INTERVENTION MAPPING TO FACILITATE DESIGN OF A MATERNAL SELF-CARE INTERVENTION.....	59
Summary	59
Introduction.....	60
Methods.....	63
Telephone Interviews	63
Application of Intervention Mapping Framework	66
Results.....	68
Telephone Interviews	68
IM Strategies for Intervention Development.....	74
Discussion	79
Conclusion	81

REFERENCES	83
CHAPTER 4: USING PLAN, DO, STUDY, ACT CYCLES TO IMPROVE A MATERNAL SELF-CARE INTERVENTION WITH AUDIENCE INPUT	87
Summary	87
Introduction.....	88
Methods.....	90
The HEROs Self-Care Intervention	91
Plan-Do-Study-Act Cycles	94
Data Collection and Analysis	95
Results.....	97
Cycle A: Content	98
Cycle B: Implementation Strategies:.....	101
Cycle C: Digital Supports:	102
Discussion	104
Conclusions and Implications for Practice	106
REFERENCES	108
CHAPTER 5: THE REFINED HEROS SELF-CARE INTERVENTION	111
Overview	111
Program Structure	111
Programmatic Components.....	114
Considerations.....	124
Conclusion	125
REFERENCES	126
CHAPTER 6: PILOT TESTING THE HEROS SELF-CARE PROGRAM TO INFORM INTERVENTION NEED, FEASIBILITY, AND ACCEPTABILITY	129
Summary	129
Introduction.....	130
Section I: Program Implementation and Evaluation Measures.....	133
Conceptual Model	133
Baseline Measures	138
Program Feasibility	146
Program Acceptability.....	147
Data Analysis	148
Section II: Baseline, Feasibility, and Acceptability Results	149
Baseline Measures	149
Program Feasibility	155
Program Acceptability.....	157
Discussion	163
Conclusion	169
REFERENCES	170
CHAPTER 7: DISCUSSION.....	177
Future Directions	181

Strengths and Limitations	184
Conclusion	185
REFERENCES	187
APPENDIX I: IRB APPROVAL FOR THE HEROS STUDY.....	191
APPENDIX II: THE SELF-CARE INTERVIEW SCRIPT TO INFORM INTERVENTION MAPPING.....	192
APPENDIX III: INTERVENTION MAPPING MATRIX	203
APPENDIX IV: SAMPLE FROM THE HEROS SELF-CARE ELECTRONIC BINDER	206
APPENDIX V: PDSA STAGE 2 AND 3 INFORMED CONSENT PACKETS.....	223
APPENDIX VI: STAGE 2 RECRUITMENT FLYER TO INFORM PDSA CYCLES	233
APPENDIX VII: STAGE 2 GROUP DISCUSSION AND INDIVIDUAL INTERVIEW GUIDES TO INFORM PDSA CYCLES	234
APPENDIX VIII: STAGE 3 HEROS SELF-CARE PILOT TEST RECRUITMENT FLYER AND INTEREST FORM.....	239
APPENDIX IX: STAGE 3 HEROS SELF-CARE POST INTERVENTION INTERVIEW GUIDE	242
APPENDIX X: HEROS SELF-CARE HEALTH FAIR REPORT CARD.....	248
APPENDIX XI: SAMPLES FROM THE HEROS SELF-CARE WORKSHOP FACILITATOR GUIDES	250
APPENDIX XII: SAMPLES FROM THE HEALTH COACHING FACILITATOR GUIDES	267
APPENDIX XIII: HEROS SELF-CARE PROCESS DATA COLLECTION FORMS (SELECT)	277
APPENDIX XIV: HEROS SELF-CARE PROGRAM KEEP MODIFY OMIT TABLE	285

LIST OF TABLES

Table 3.1. Operational Definitions by Social Cognitive Theory (SCT) Construct and Sample Questions about Maternal Self-Care Practices	65
Table 3.2. Supporting Quotations for Emergent Themes and Subsequent HEROS Self-Care Intervention Considerations	69
Table 3.3. Strategies and Determinants by HEROs Self-care Intervention Program	76
Table 4.1. HEROs Self-Care Intervention Components and Areas for Assessment	93
Table 4.2. Select Discussion and Interview Questions by Intervention Component to Inform PDSA Cycles for HEROs Self-Care Refinement	96
Table 4.3. Selected Examples of Program Changes Based on PDSA Cycle Data	100
Table 5.1. Performance Objectives for the HEROs Self-Care Intervention and Behavioral Determinants of Change.....	113
Table 5.2. Program Elements, Activities, and Handouts for the HEROs Self-care Program	123
Table 6.1. HEROs Self-Care Timeline: April, 2019 – July, 2020	137
Table 6.2. Feasibility Assessment of the HEROs Self-Care Program	147
Table 6.3. Maternal and Child Demographics for the HEROs Self-Care Intervention	150
Table 6.4. Maternal and Child Outcomes for the HEROs Self-Care Intervention	152
Table 6.5. Maternal Distal Mediator and Moderator Responses for HEROs Self-Care.....	154
Table 6.6. Self-efficacy Scores for the HEROs Self-Care Intervention	155
Table 6.7. Data Informing Feasibility of the HEROs Self-Care Program	156
Table 6.8. HEROs Self-Care Post-Intervention Interview Findings with Quotes by SCT Construct and Intervention Component	158

LIST OF FIGURES

Figure 2.1. Social Ecological Model of Influences on Child Weight Status ⁴⁰	12
Figure 3.1. Conceptual Model for HEROs Self-care Program to Target Maternal Health Behaviors as a Strategy for Childhood Obesity Prevention Efforts.....	78
Figure 4.1. Summary of Plan-do-Study-Act (PDSA) Cycles by Stage and Intervention Component for the HEROs Self-Care Program	91
Figure 4.2. Plan-do-Study-Act (PDSA) Cycles for the HEROs Self-Care Intervention	103
Figure 6.1. HEROs Self-Care Conceptual Model Outlining the Relationship between Intervention, Mediators, and Maternal and Child Outcomes	134

CHAPTER 1: INTRODUCTION

Obesity has continued to be a major health concern for adults and children in the United States¹. Poor diet and physical inactivity are strongly related to weight status, yet many Americans do not meet diet and physical activity (PA) recommendations^{2,3}, and negative health effects of childhood obesity can have implications into adulthood⁴. Ecological approaches are critical to understanding environmental factors impacting rates of childhood overweight and obesity⁵ as unique barriers to health behaviors exist for populations living in rural environments from low socioeconomic backgrounds^{6,7}. In the family context, maternal health and health behaviors like role modeling, coaching, or influencing diet^{8,9}, physical activity (PA)^{10,11}, and psychosocial stress^{12,13} can play an important role in child weight status, particularly in early, formative years like preschool. Thus, maternal health is an important consideration in childhood obesity prevention efforts. Self-care and mindfulness are strategies to promote healthy behaviors such as diet, PA, and stress management, but few obesity interventions consider these strategies, especially in the family context. The HEROs Self-Care program was designed using a multiple method approach to fill this gap and integrate maternal self-care into childhood obesity efforts.

Children's diet and PA behaviors are largely shaped by the environments in which they live¹⁴, and ecological approaches to obesity prevention can explain the interaction between children's environments and behaviors⁵. Parental diet and PA, specifically in mothers, play an important role in child weight status. In terms of diet, maternal dietary intake is positively associated with child dietary intake^{15,16}, and mothers may make decisions about the type and quantity of food present in the household¹¹. Mothers may also influence the development of PA skills, behaviors, and habits in young children through role modeling and promotion¹⁷. While

mothers make important contributions to diet and PA behaviors of the family, it is important to note that women of childbearing age are particularly vulnerable for obesity and related diseases¹⁸, with 54% of overweight or obese women being of childbearing age¹⁹. Collectively, these factors make mothers an important target in obesity prevention efforts within the family context and childhood obesity interventions.

Maternal psychological stress can impact weight status as well as diet, and PA behaviors^{20, 21}, and has even been linked with child psychological stress and obesity rates^{12, 13}. Self-care is an intervention strategy used to promote health among populations in high-stress professions^{22, 23}, and it encapsulates any health-promoting activities related to diet, PA, and stress management behaviors to maintain personal well-being^{24, 25}. Mindfulness, or awareness and presence to internal needs and external factors^{26, 27}, has been used in stress management interventions and to promote healthy dietary²⁸ and PA behaviors²⁹. These represent promising methods for health promotion^{22, 30}, including addressing maternal mindfulness and self-care as intervention strategies in childhood obesity prevention efforts.

Intervention strategies can be used to target specific behaviors, but there is a need for a framework to unite and organize these strategies in intervention design. Intervention Mapping (IM) is a framework for intervention design that incorporates theoretical determinants of behavior change, stakeholder input, behavior change methods and strategies, and consideration of evaluation and implementation³¹. IM provides an iterative and structured approach to intervention development for health promotion efforts³¹ and has served as a framework for various obesity interventions^{32, 33}. Beyond IM and design, interventions can be refined during development to better identify effective intervention components and adapt pieces to a local context³⁴. One method of refinement, often used in healthcare quality improvement, is the Plan-

Do-Study-Act (PDSA) model, whose purpose is to select, identify, test, and adapt components of an intervention³⁵. In this study, these approaches were used to develop and refine a maternal self-care intervention to address childhood obesity prevention, allowing for the incorporation of target audience input into the feasibility and acceptability of this type of intervention to address obesity in the family context. The resulting intervention was the HEROs Self-Care Program.

The objective of the (HEROs) Self-Care program was to promote maternal mindful self-care behaviors to improve diet quality, PA behaviors, and stress management practices. The 6-week program consisted of an initial in-person workshop, followed by 4 weekly individual health coaching sessions through videoconferencing and concluding with a second group workshop. The 2 workshops were designed to last 1.5 hours, and the health coaching videoconferencing sessions were 30 minutes in length. Program content encompassed topic areas of prioritizing self-care, goal setting for self-care, healthy eating, PA behaviors, stress management, mindfulness, and setting a self-care plan. In addition to workshops and coaching sessions, program content was reinforced through a series of handouts. Handouts were compiled into an electronic binder (eBinder) and loaded on a study issued tablet (iPad mini). Digital supports supplemented program content and delivery and included applications loaded onto the iPad mini, a PA tracker (Garmin VivoSmart4 Activity Tracker), and a complementary intervention website (www.sporks.colostate.edu). The study was pilot tested with participants recruited from preschool centers in Eastern Colorado from February 2020 – July 2020.

The overarching goal of this dissertation was to design a mindful self-care intervention and investigate its feasibility and acceptability for mothers of preschool-aged children. This goal was addressed in 4 objectives:

Objective 1 – To develop a mindful, self-care intervention by 1a) examining mothers existing beliefs, practices, and supports or barriers related to maternal self-care via one-on-one interviews; and 1b) using Intervention Mapping as a framework to integrate target audience input into the design of the HEROs Self-Care program. (Chapter 3).

Objective 2 - To pretest key components of a mindful self-care program for mothers of young children and examine: 1) acceptability of the intervention content; 2) suitability of the implementation strategies; and 3) feasibility of key intervention digital supports in rural communities. (Chapter 4).

Objective 3 - To describe the intentional design and final intervention components of the HEROs Self-Care program and outline the rationale for inclusion of specific behavior change strategies (Chapter 5).

Objective 4 - To summarize baseline health characteristics and target behaviors as well as to explore the feasibility and acceptability of the HEROs Self-Care program through pilot testing with mothers of preschool-aged children with limited resources and living in rural communities. (Chapter 6).

This study will result in the development of a maternal self-care intervention, the HEROs Self-Care program. Pretesting intervention components of content, implementation strategies, and digital supports will lead to programmatic refinement, and pilot testing the intervention with

members of the target audience will provide insights on component feasibility and acceptability to inform program modifications and future testing in a larger sample.

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CHAPTER 2: LITERATURE REVIEW

Overview

Obesity is a health concern for adults and children in the United States (U.S.)^{1, 2}, and health effects of overweight and obese status in youth can persist into adulthood³. Parental diet, physical activity (PA), and stress management behaviors, specifically in mothers, play an important role in child weight status⁴⁻⁹. Maternal dietary intake is positively associated with child dietary intake^{10, 11}, and mothers often make decisions about the types and quantities of foods in the household¹¹. Studies have also found that maternal influence and role modeling play a key part in the development of skills, behaviors, and habits in children related to PA⁹. Additionally, maternal stress has been linked to child stress and obesity¹². Two specific strategies to combat stress and improve health are self-care and mindfulness. Self-care is defined as any behaviors with the aim to facilitate better health outcomes and sense of wellbeing¹³⁻¹⁵. Mindfulness is a technique that has been used in stress-reduction therapy programs and is defined as paying attention to the present moment in a particular way¹⁶. Despite growing popularity, these methods remain largely untested as a means of promoting healthy eating, PA, and stress management in mothers.

This literature review is presented in three parts. Section 1 includes an overview of the problem of obesity and subsequent health factors within adult and child populations. Next, Section 2 provides more detail on behavioral strategies for health such as self-care and mindfulness. Section 3 describes the process of Intervention Mapping, the use of behavior change theory and application of evidenced-based best practice in intervention development. Lastly, Section 4 outlines the overall goal and 3 research objectives of this dissertation project.

Section 1: Obesity and Related Health Factors

1.1. Obesity and Cardiovascular Disease Risk

The rate of obesity among adults in the U.S. reached over 42% in 2018, and continues to climb¹⁷. While Colorado is considered the ‘best’ in the U.S. in terms of obesity rates, 23.8% of Coloradans are considered obese and the rate has continued to increase in recent years¹⁸. This presents a major public health concern as obesity-generating behaviors related to poor diet and physical inactivity are associated with chronic disease risk, such as cardiovascular disease (CVD)¹⁹⁻²¹, and mortality. The complex etiology of obesity and CVD further signifies a unique challenge in chronic disease prevention efforts^{17, 22}. CVD has widespread prevalence in the United States and is the leading cause of death among men, women, and across ethnic and racial populations²³. It is estimated that around every 1 in 4 deaths can be attributed to CVD²³. Hypertension, dyslipidemia, and diabetes are obesity-related CVD risk factors^{24, 25}, indicating that obesity may have some causal role in these CVD risk factors. Conversely, obesity is purported to be its own independent risk factor for CVD^{26, 27}. Thus, CVD risk may be impacted by obesity-related risk factors including diet and physical inactivity.

Poor dietary intake and limited PA are contributing factors to the obesity epidemic in the U.S., leading to the description of environments with limited opportunity for healthy eating and PA as obesogenic¹⁰. To reduce risk for obesity and chronic disease, the Dietary Guidelines for Americans (DGA) recommend food patterns filled with fruits, vegetables, and whole grains and lower in sodium, saturated fat, and added sugars²⁸. The Physical Activity Guidelines for Americans recommend at least 150 minutes of moderate to vigorous physical activity (MVPA) a week²⁹, or 30 minutes on most days. Compliance with these DGAs and Physical Activity

Guidelines are compatible with a number of public health objectives and in alignment with obesity-related chronic disease prevention^{20, 30, 31}. Americans, however, are not meeting these recommendations^{32, 33}, and these behaviors present important intervention points for obesity and chronic disease prevention. Improved diet quality and PA levels are important targets in the context of both adult and childhood obesity prevention efforts.

1.2 Childhood Obesity within the Family Context

Childhood obesity has also continued to be a major health issue in the United States^{1, 2}, and the negative health effects of obesity in youth can persist into adulthood³. In Colorado, the prevalence of obesity in children aged 2-14 years old is 27%, but as high as 41% for the same age group in rural environments³⁴. Rates of obesity in Colorado for children aged 2 to 4 years old is at 8.1%³⁴. What's more, diet and PA behaviors formed in early childhood have been shown to predict behaviors and health outcomes into adulthood^{35, 36}, making the preschool years an important time for obesity-related interventions promoting healthy eating and PA.

Obesity is also disproportionately high among young children and families from minority populations and low-socioeconomic status, and those living in rural communities. Families living in rural areas often experience limitations in healthy food access, healthcare opportunities, and face barriers to achieving adequate PA³⁷. These factors reveal that rural, low-income populations are particularly susceptible to becoming overweight or obese and may have an inflated propensity toward obesity-related health concerns and complications. Previous literature has linked these health risks with unique stressors associated with low socioeconomic status and living in rural settings such as a lack of resources, isolation in rural environments, or financial constraints³⁸.

One strategy for obesity prevention is to target an environment or system in which a child lives and operates. Factors for children's healthy development as well as for maladjustment begin within the family context³⁹, and more information about the formation of healthy behaviors like healthy eating and PA in the context of family systems is warranted. The social-ecological model (SEM) is one model used to describe the impact of local and global systems, like the family setting, on individual factors like child weight status. Ohri-Vachaspati and colleagues (2015) present an SEM with concentric layers of influence including intrapersonal, interpersonal or relational, community, and societal domains (Figure 2.1)⁴⁰.

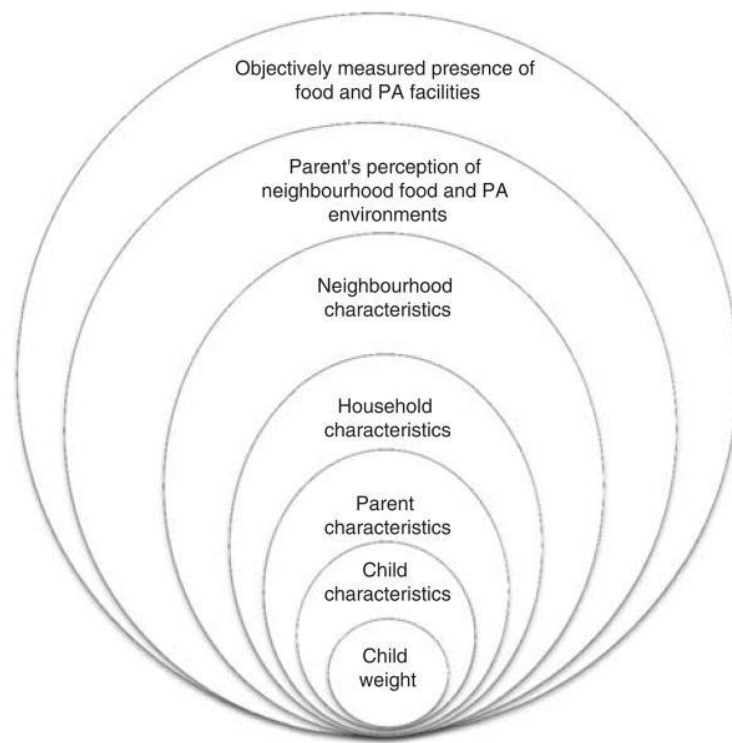


Figure 2.1. Social Ecological Model of Influences on Child Weight Status⁴⁰

Ohri-Vachaspati and colleagues (2015) collected data within a high-minority and limited-resourced population on children's BMI and environmental factors at each layer of the

SEM to examine the contribution of each layer on a child's weight status. Figure 2.1 outlines their proposed SEM layers impacting child weight status with a focus on physical activity and healthy eating behavior determinants⁴⁰. The model illustrates the factors that might influence child weight outcomes, which extend from individual factors like age and sex to household influences like the types of foods present⁴¹ as well as the level of opportunity to be physically active⁴² and learn fundamental movement skills⁴³.

Neighborhood, environmental, and societal influences, also reflected in this model, have been shown to play a role in a child's weight status, especially in rural environments⁴⁴. Families in rural settings face unique barriers to healthy eating and PA behaviors such as limited time, frequency of eating foods away from home, perceived cost of healthier foods, and distance to grocery stores⁴⁴. PA barriers include poor weather impacting ability to maintain PA outside, lack of or distance to exercise facilities, social norms, and limited time⁴⁴. Obesity is a multidimensional problem, and a more holistic approach to prevention and understanding of the causes and implications of obesity are necessary⁴⁵.

Preschool-aged children are especially dependent upon their parents and environments in which they live for the development of diet and PA behaviors^{8, 9, 36, 42, 46, 47}. Children learn positive or negative behaviors at an early age and are influenced by the environments in which they reside, including the family social context and the physical household^{47, 48}. Moreover, diet and activity behaviors formed in youth have been shown to predict behaviors and health outcomes into adulthood^{35, 36}, making the preschool years an important time for obesity-related interventions promoting healthy eating and PA.

1.3 Associations Between Maternal Obesity-related Health Factors and Child Health

Outcomes

There are many parental behaviors which may potentially influence the development of young children's behaviors and weight outcomes, including general parenting styles⁴⁹, parenting feeding styles and practices⁵⁰, parent physical activity practices^{51, 52}, and parent role modeling around diet^{11, 53} and physical activity^{54, 55}. Parents, and mothers specifically, play a vital role in shaping not only the social environment but also the physical home food and PA environments^{10, 36, 46, 47, 56, 57}. Mothers may act as the food gatekeeper of the household as purchasers and preparers of food and also make decisions about the types and quantities of foods offered to children¹⁰. These play an important role in child weight status^{4,9}. Beyond presence or absence of health promoting factors in the household, mothers also play a role in creating and fostering habits, and often set the family diet^{36, 58-61} and PA⁶² norms and behaviors^{11, 53}. Maternal health factors, like diet, PA, stress, and the created home environment and family context, may play a pivotal role in child diet quality, PA levels, and weight outcomes.

1.3.1 The Impact of Maternal Dietary Practices on Child Behaviors and Outcomes

Mothers greatly influence their children's food experiences through the social environment established in the home as well as within the physical environment. In terms of the social environment, eating patterns develop in social interactions around food and in observed, modeled behaviors³⁶. Maternal approaches to their own dietary intake can impact children. For example, research supports that maternal disordered eating behaviors such as disinhibited⁶³ or restrictive eating behaviors⁶⁰ may be associated with child eating behaviors. Dietary role

modeling is most often described through maternal dietary intake consistent with child intake in terms of type of food as well as quantity¹⁰, and the amount of food served to a child has been shown to correlate with how much food is actually consumed⁶⁴. Maternal dietary intake has been reported as an important predictor of child intake across dietary components including foods recommended for consumption by the DGAs (fruits, vegetables, and whole grains) and non-recommended foods (high calorie snacks and drinks)^{53, 65, 66}. A study by Koh et al. (2014) revealed that parental self-efficacy and confidence in child-feeding practices mediated the introduction and exposure to new foods as well as vegetable intake⁶⁷.

Other maternal dietary behaviors beyond intake and self-efficacy may be associated with or predictive of child eating behavior and subsequent weight status. Maternal feeding practices and perceptions around diet have also been linked with child eating behaviors and even weight outcomes. Research shows that mothers can directly influence child intake and obesity through feeding practices and parenting styles⁶⁸, and childhood obesity has been linked with highly controlling as well as highly indulgent parenting practices relating to dietary intake⁶⁸.

Recommendations point to responsive feeding, or caregiver guidance regarding a child's observance of hunger and satiety cues⁶⁶. Further, responsive feeding stems from responsive parenting, involving the creation of an emotional context and routines to promote parent-child interactions as well as clear and responsive communication between the child and parent⁶⁹. A study by Power et al. (2015) with mothers of lower socioeconomic status found that many mothers did not engage in feeding practices in alignment with current recommendations⁷⁰. For example, mothers in the study spent time encouraging eating, irrelevant of the child's hunger or fullness cues and made considerable attempts to enforce table manners instead of talking about food characteristics or eating skills⁷⁰. A study by Birch and Fischer (2000) evaluated maternal

dietary restraint as well as perceptions of their child's risk for overweight, finding these two variables predictive of maternal child-feeding practices and subsequent relative child weight and eating⁶⁰. Further, additional studies have found maternal beliefs and perceptions about overweight and obesity to be predictive of particular feeding practices like fruit and vegetable offerings^{61, 71}. Collectively, these studies further suggest that family and social environmental influences may play a role in the etiology of childhood overweight and obesity^{59, 60, 63}.

In terms of the physical environment, mothers also act as food gatekeepers, or the member of the household that shapes the physical home food environment (HFE), by making decisions about food acquisition and preparation¹⁰. The HFE represents another area that impacts the diet behaviors of children, and it encapsulates all foods brought into the home as well as individuals' relationships, habits, and practices with the food^{10, 46, 56}. Food purchasing, food availability, individual beliefs and desires regarding food, and available information about food all can shape the HFE^{10, 56}. Boles and colleagues (2019) found a positive association between the presence of specific foods present in the HFE and dietary intake across nutrient-rich foods and calorie-dense foods for preschool-aged children⁴¹. Further, a study by Amuta et al. (2015) found that household availability of fruits and vegetables, important components of the DGAs, was directly related to individual consumption of these foods amongst children from rural, low-income families⁷². Thus, the availability of healthful and unhealthful foods in the home can play a particularly important role in the consumption of specific foods as well as the development of food preferences, behaviors, and practices among young children.

To assess overall diet quality objectively, the Healthy Eating Index (HEI) provides a score for individual diet quality and has been applied to assess the quality of the HFE⁷³. The HEI assesses adherence to the DGAs by calculating an overall diet quality score as well as sub

scores for adequacy (e.g. fruits, vegetables, whole grains) and moderation (e.g. sodium and saturated fats)⁷⁴. A score of 100 indicates a diet pattern that is of high quality and largely in accordance with the DGAs. The average score for American Adults is 59, illustrating the average American diet pattern indicating partial fulfillment of the DGAs⁷⁴. The HEI has been applied to the HFE to assess the presence of foods in the home using a quality checklist called the Home Inventory Describing Eating and Activity -2 (Home-IDEA-2)⁷³. Tools such as the Home-IDEA-2 can assess the quality of the foods available in the home^{41, 73}.

The relationship of dietary quality amongst household members is not well reported in the literature, but a study by Fisk et al. (2011) examined the relationship between maternal food choices and their children's diet quality. Findings revealed that maternal diet quality was the largest predictor of child dietary quality, accounting for almost a third of the variance in child dietary quality. The study concluded that improving maternal dietary quality could be effective in targeting a child's diet⁷⁵. While this study points to the relationship between mother and child diet quality, however, evidence is limited.

1.3.2 The Impact of Maternal PA Practices on Child Behaviors and Outcomes

Among young children, PA is important for healthy development and growth⁷⁶, decreased risk for CVD risk factors in later years⁷⁷, and reduced likelihood of overweight or obesity⁷⁸. Patterns of PA and inactivity in the preschool years have been shown to consistently predict PA levels throughout childhood⁷⁹ in to adulthood³⁵ and represent an important intervention point in combatting both childhood and adult obesity rates. The literature has shown that the establishment of PA patterns in early childhood may mitigate declines in PA

throughout development, and that younger preschool children may benefit more from increased rates and practice of PA⁸.

Similarly, to the food landscape, the home environment can greatly shape experiences of PA children through influence of the social environment with learned habits and behaviors as well as within the physical environment where the presence or absence of certain PA supports⁸,⁸⁰. In terms of the social environment, parents of preschool-aged children have a role of inhibiting or promoting their children's PA practices. The frequency of parental PA has been linked with the frequency of preschooler PA⁸, suggesting family level trends in PA. Dempsey and colleagues (1993) found that children are influenced by their parents and subsequent home environment either directly with role modeling of PA or indirectly through spoken and unspoken belief systems represented in parental encouragement, practical facilitation of PA, or time designated to PA versus sedentary activities⁸⁰. With these direct and indirect influences, parents may role model physical activity behavior^{7-9, 81} or make decisions about routines involving screen time versus active time⁴².

Various studies have found that parents may role model healthy PA behaviors and screen-time associated sedentary behaviors^{62, 82}, influencing these active or inactive patterns of behavior within their children. A study by Schoeppe et al. (2016) investigated the associations between parent and child (early adolescence) activity and screen time while assessing for the moderating effects of both parent and child sex⁸². Maternal participation in PA (sport and outdoor activities like walking), and not paternal participation, was significantly associated with higher participation in PA among their children, regardless of child sex. Both parents' screen time, alternatively, was significantly associated with screen-based behaviors in boys. Thus,

maternal modelling of PA had a significant influence on children, while more sedentary behaviors seemed to be promoted by both parents and equally influential⁸².

Mothers also influence fundamental movement skills,⁴³ a set of gross motor skills used for specific movements. These skills provide the building blocks for more complex forms of PA. Zeng et al. (2019) demonstrated that practice of fundamental movement skills can influence various ecological spheres including at the child, family, and environmental levels⁴³. Thus, the role of the family in preschooler PA levels may represent an important consideration for interventions targeting PA behaviors and obesity prevention among this age group. The family, and mothers specifically, impact child PA levels through shared beliefs and routines about PA initiated within the family system as well as with role modelling and the presentation of opportunities for PA over more sedentary activities like screen time.

In terms of the physical environment, certain factors may encourage either sedentary behaviors or PA^{46, 83}. The presence of media-devices such as tablets and televisions can influence sedentary behaviors in children, while the presence of equipment used for activity can impact PA behaviors in children^{46, 83}. Factors that encourage PA behaviors might include limiting access to media devices (like televisions and tablets), parenting practices about media usage, swapping sedentary digital applications for active apps, family PA habits, and the presence of PA equipment^{46, 83}. A systematic review by Kaushal et al. (2014) found that large exercise equipment (like treadmills and bicycles) as well as prominent exergaming equipment (like dance mats or an exergaming bicycles) can be more effective in encouraging PA behaviors among preschoolers and adults than smaller or out-of-sight equipment⁸⁴. Zeng and colleagues (2019) found a direct relationship between presence of child PA equipment and preschooler

motor skill development⁴³. Thus, the home physical environment can be set up in such a way as to promote either sedentary or PA behaviors in families and young children.

1.3.3 Maternal Stress

Beyond diet and activity, maternal psychosocial stress is another health factor that has been linked with weight status within the individual and family contexts^{5, 85}. Stress has been defined as the biological and psychological response to an actual or perceived demand or threat⁸⁶ and is identified as one potential contributing factor to the increase in rates of obesity^{87, 88}. Studies have shown that chronic stress can have a negative impact on physiological health and health behaviors,⁸⁹ particularly on diet⁸⁸ and PA,⁹⁰ as well as behaviors and motivation for healthy eating and physical activity⁹¹. Specifically, research has shown that chronic stress can increase appetite, affect a preference for energy-dense foods,^{87, 92-94} and can also affect the distribution and storage of fat within the body.^{95, 96} Additionally, experiences of stress may impede the achievement of healthful levels of PA and motivation to be physically active⁹⁷.

Maternal stress may stem from a number of factors. Crnic & Low (2002) found that challenging behavior among children and the daily tasks of parenthood can frustrate parents, leading to a stressful experience¹². They further found that contextual factors, child-specific traits, and parenting styles influence perceived parenting stress, as well^{12, 98}. The preschool years, specifically, present an array of age-specific challenges and stress for parents due to children's bids for autonomy, emerging preferences, and emotional reactivity often exhibited by young children^{12, 98}. More research is needed about the role of stress in diet and activity behaviors for parents of young children, especially in the formative preschool years where habits and preferences are formed and parental wellbeing plays a major role⁹⁹.

Emerging research has strengthened the case for the inclusion of maternal stress in childhood obesity interventions^{4-6, 100}. The Mothers' and their Children's Health (MATCH) study used the Perceived Stress Scale (PSS)¹⁰¹ to measure maternal stress and diet to assess children's (aged 8-12 years) Healthy Eating Index 2010 (HEI-2010). The findings revealed that higher-than-average maternal stress at baseline was associated with a larger decline in children's HEI-2010 score over a year period¹⁰⁰. In a study by Berge et. al (2020) with households experiencing food insecurity found that high levels of parental stress and depressed mood impacted parenting feeding practices⁷¹. Momentary stress, measured using Ecological Momentary Assessment (EMA)^{102, 103} which allows for real-time assessment of fluctuations in behavior across time and context, revealed that mothers with higher levels of stress early in the day were more likely to engage in restrictive or pressure-to-eat feeding practices, serve fast food, and to have children demonstrate picky eating behaviors at the evening meal during the same day⁷¹.

A small set of studies have reported interventions related to maternal stress and the impact on child diet and PA, and these show promise as an effective intervention strategy^{5, 104}. Jastreboff et al. (2018) piloted a parental stress intervention to decrease risk for childhood obesity with 42 parent-child dyads of low-income⁵. Group training in mindful parenting occurred alongside nutrition and physical activity counseling for the intervention group⁵. Findings revealed that the inclusion of an 8-week mindfulness-based parent stress interventions with diet and PA counseling to be feasible and effective in changing weight-related behaviors within family systems⁵. Park and Walton-Moss (2012) found parent distress to be associated with children's health-related behaviors such as diet and PA⁷. Thus, there is a need to address more than diet and PA behaviors within family obesity prevention efforts. Stress may be an

important consideration in obesity interventions, and more information is needed on the effectiveness of stress management strategies in obesity prevention efforts.

Section 2: Self-care and Mindfulness as Strategies for Maternal Health Promotion

As stated above, stress can have a negative impact on health⁸⁹, particularly on diet⁸⁸ and PA⁹⁰. Because of the impact of stress on risk for obesity, targeting stress management behaviors may prove an effective strategy in improving overall health behaviors including diet and PA. Stress-management encompasses any techniques or practices aimed at reducing stress, especially chronic stress, in order to promote health-supportive functioning¹⁴. These stress management practices may also be an effective strategy and target for populations facing unique and high-intensity stress¹⁴. Recent trends in popular media have highlighted two specific strategies to promote healthy behaviors and combat stress: self-care and mindfulness, though these as strategies in obesity prevention intervention design is largely understudied¹⁰⁵.

2.1 Self-care

Self-care is a complex term that has been used to represent a variety of health-promoting behaviors¹⁴. Despite its growing popularity in society and on popular media, there is little consensus on an inclusive definition of self-care across fields of research^{105, 106}. There are various self-care definitions, often specific to the group or population being studied. The scope of self-care literature includes disease prevention¹⁰⁷, mental and physical health promotion^{13, 108}, palliative care¹⁰⁹, and career-specific self-care needs to prevent or treat burnout^{14, 110}. Most clinical research focuses on self-care among populations with multiple chronic conditions or for groups facing burnout and includes condition maintenance, monitoring, and management

components^{105, 107, 111}. Despite these variances in definition, an overarching description, however, includes any health-promoting activities performed to maintain personal well-being throughout life^{14, 110, 112, 113}.

Self-care is used to encourage behaviors like healthy eating, PA, and stress management among chronically stressed populations and professions, and has been shown to be of particular benefit to those professions and individuals under extreme levels of stress and at risk for burnout¹⁴. Interventions and studies have analyzed self-care among nurses¹³, therapists^{15, 110}, care-givers of patients with cancer¹¹⁴, and even for parents in substance abuse programs¹¹⁵. A self-care intervention with nurses, for example, included any behaviors related to the improvement of meal patterning, exercise behaviors, and stress level management as components as self-care¹³. Further, participants identified strategies to encourage these self-care as time-management skills, regular set meal times, resource guides, recipes, and social support.¹³ Self-care in parenthood can include taking care of physical health (e.g., eating nutritious foods and engaging in physical activity), maintaining mental health (e.g., stress management), continuing education, or even connecting with a child and building relationship^{113, 115}. Raynor and colleagues (2016) found that perceived benefits of self-care for parents recovering from addiction included improved self-esteem, improved parental care through acceptance and changes in parenting practices, and in modeling better behaviors to their children¹¹³. Thus, self-care is a valuable tool to promote health and wellness, and parents perceive self-care to be beneficial.

However, self-care as a strategy in obesity prevention intervention design is largely understudied¹⁰⁵ and research to examine the effectiveness of a self-care strategy targeting healthy eating, PA and stress management is needed.

2.2 Mindfulness

One form of self-care used as a coping mechanism for stress management is the practice of mindfulness. A growing body of literature suggests that mindfulness is an effective stress management strategy to improve physical and mental well-being and might even help to prevent burnout from stress^{15, 108, 116, 117}. Mindfulness, or awareness and paying attention in a particular way, nonjudgmentally, in the present moment¹⁶, has also been used as a method of self-care¹¹⁸. Another, broader definition combines both terms of mindful self-care as awareness of internal needs and external demands as well as intentional practice of health promoting activities to meet one's needs and promote one's wellbeing with kindness¹¹⁸. It can be traced to Buddhist teachings in the *Abhidhamma* text¹¹⁹. In this text, *vipassana* is an openness to one's surroundings and environment and *samatha* is a concentrative ability. *Sati* is a lucid awareness. Thus, the intersection of these is an open, non-judgmental, awareness and concentration on one's internal and external environment¹²⁰. Noticing in this way provides an opportunity to step outside of a moment or feeling or thought. Nonjudgmental observation may then mitigate some of the psychological stress responses to internal and external stimuli caused by demands or threats. This, in turn, may reduce the amplitude of the emotional reaction to stressful events¹⁶.

John Kabat-Zinn, a leading expert in mindfulness, recognized the usefulness of mindfulness as a stress reduction technique, creating mindfulness-based stress reduction (MBSR) trainings to treat or prevent various negative health consequences of chronic stress and to minimize or reduce levels of perceived stress¹⁶. Elements of the MBSR program include mindfulness concepts of breath patterning, bodily awareness, and exploration of thoughts and feelings. It has been used in therapy programs and trainings to manage stress and increase mindfulness¹⁶. Mindful practice has also been applied to relationship building within the family

context^{121, 122}. Coatsworth and colleagues (2014) found that integration of mindfulness in a family intervention led to the use of mindful activities in parents' daily lives resulting in improving the quality of youth-parent relationships as well as positively affect youth development¹²¹.

Mindfulness has received significant interest as a possible determinant of health¹²³. Related to diet and physical activity, mindfulness has been used to enhance psychological well-being to decrease stress-eating and increase physical activity^{5, 85, 124, 125}. Mindfulness and mindful awareness of feelings, emotions, and experiences have even been associated with maintaining exercise programs and goals, healthy body weight, and even cardiovascular health^{123, 124, 126}. Interventions have employed the concept of mindful eating and have been effective in treating obesity-related eating behaviors like binge eating and emotional eating^{127, 128}. Skills enhanced and cultivated through mindfulness practices related to eating are enhanced self-regulation, improved awareness of cues pertaining to emotions, and understanding one's relationship with food^{85, 127-129}. It is important to note that while mindful awareness is different from mindful activities, mindful activities may help to bring awareness to daily life and disrupt the autopilot mode stimulated by stressful situations¹²⁴. Mindful eating and mindful activities such as breath exercises, yoga, or tai chi can be used to cultivate general mindful awareness of one's experiences¹²⁴.

Research in mindfulness has largely encapsulated clinical integration of mindfulness-based strategies for stress reduction and health with programs like MBSR¹⁶. Strategies employed by programs such as these include mindful breathing techniques, mindful body scans, and even mindful listening activities to manage stress¹⁶. Beyond a stress buffering capacity, practice of mindfulness has been used to enhance uptake of new information through honing of

skills like self-awareness, self-regulation, and attention¹³⁰. Mindfulness has also been linked with diet quality and PA levels. Gilbert & Waltz (2010) found that the degree of mindfulness practice in everyday life predicted PA levels, fruit and vegetable intake, and self-efficacy regarding general health practices¹³¹. Thus, incorporation of the practice of mindfulness into intervention components targeting self-care behaviors relating to healthy eating, PA, and stress-reduction in parents presents a holistic approach to these behaviors.

Section 3: Intervention Approaches for Obesity Prevention and Health Promotion in Families

With rates of obesity as high as they are, it is important to explore novel and innovative approaches to treatment and prevention of obesity and obesity-related chronic diseases⁴⁵, especially for adults. Traditional counters to the obesity epidemic involve energy balance modeling, dieting, calorie-counting, and exercise¹³². Other factors beyond calorie balance, like stress and the family context or home environment, may contribute to the high prevalence of obesity across age-groups⁴⁵. Thus, childhood obesity interventions specifically should consider multiple factors in promoting health behaviors.

3.1 The Healthy EnviRONments Study

Research has been conducted to support healthy behaviors for children within the family context. The HEROs (**H**ealthy **E**nvi**R**Onments), one such study, strives to promote healthy home environments and lifestyles for mothers of young children who were from low-income, rural communities¹³³. The HEROs study was conducted in 3 main phases: 1) formative research, 2) intervention development, and 3) a feasibility study. The resulting intervention included a 6-

week family-based intervention with parent and child workshops aimed at building healthful home environments favorable for the development of healthy eating behaviors and PA patterns for preschoolers and targeting parent-child interactions during mealtime and PA¹³³.

Prior to implementation, a robust formative research phase of the HEROs study was conducted to inform intervention development. Three formative research studies, the Family Health Study (FHS), Ecocultural Interview Study, and Parent PA Interviews provided the basis for this dissertation. The FHS examined health outcomes in mothers of young children living in rural communities and their relationship to child weight. Findings revealed a high prevalence of CVD risk factors (HDL cholesterol, triglycerides, hemoglobin A1c (HbA1c), blood pressure, and waist circumference) among mothers and that these risk factors were related to both maternal and child weight outcomes¹³⁴. CVD risk was associated with elevated child BMI percentile, indicating the need for public health interventions at the family level to address maternal and child health¹³⁴.

Ecocultural family interviews were conducted with mothers to better understand the daily life of families with young children. As part of daily routines, emphasis was placed on understanding eating routines, PA opportunities, and factors that shape routines in households¹³⁵. Importantly, stress was described by mothers as well as environmental barriers to PA and healthy eating were contributors to what influences daily routines. Specifically, employment schedules, management of preschooler behavior, and feelings of social isolation in rural environments prevented parents from consistently enacting recommended routines related to eating and PA¹³⁵. In the Parent PA interviews, parents provided insights into beliefs, values, and practices related to PA in context of families living in rural communities and with limited resources. Interviews revealed that few parents had set exercise routines and that PA is viewed

as a way to spend time together as a family and to role model healthy and active lifestyle factors. Barriers to regular PA for parents included lack of time, physical limitations and being out of shape, and family obligations¹³⁶.

While the HEROs intervention was primarily intended to promote healthy diet and PA environments and behaviors for families with preschoolers, the formative phase of the project revealed a need to further examine self-care of mothers. No childhood obesity prevention efforts have included maternal self-care as an intervention component, and based on the formative phase of HEROs, there was a desire to provide intervention content and strategies that expanded beyond just the child and included the health of mothers.

3.2 Health Behavior Interventions

The term ‘intervention’ refers to any combination of program element, policy, or strategy aimed to produce some behavior change¹³⁷. In obesity interventions, these elements and strategies usually involve targeted diet and PA behavior change or changes in an environment to impact diet or PA behaviors¹³⁸. To target behaviors for change, interventions might include educational programs, skill-building opportunities, or coaching through specifically set goals¹³⁹.

Intervention design includes decisions made about strategies to be used, theoretical constructs, resources and methods used, and basic findings that occur between the inception of an intervention and any formal pilot or feasibility testing¹⁴⁰. Similarly, good intervention development requires attention to the outlining of clear outcomes, evidence-based designs, and avoidance of potential biases^{140, 141}. Involvement of stakeholders and community participants in development of an intervention can also improve its implementation; the adaptation, fidelity, and sustainability of an intervention and subsequent translation into practice¹⁴².

Theory is a major consideration for behavior-change interventions. In the development of complex behavior-change interventions, theory should drive intervention elements as they help untangle complex phenomena and provide suggestions as to what circumstances may impact behavior¹⁴³. Interventions informed by theory are more likely to be successful and often result in better outcomes¹⁴⁴. Additionally, reviews have found interventions including behavioral-theory based strategies to be more efficacious in achieving behavior change for diet and activity than knowledge-based programs alone^{145, 146}. Thus, approaches incorporating behavior-change theories as well as aiming to increase knowledge may be more efficacious than knowledge-based programs alone.

There are many strategies for developing interventions that make appropriate use of theory. Planning and development frameworks should consider the theoretical determinants of behavior change, change techniques, and the adoption and feasibility of an intervention component¹⁴¹. Intervention optimization, or enhancement of certain intervention components to improve effectiveness, can also be used to ensure theory is integrated into interventions. Optimization of an intervention can occur prospectively, in vivo, or retrospectively¹⁴⁷. Prospective optimization applies theoretical concepts and background information. In vivo optimization makes use of community and stakeholder feedback immediately, within initial testing. Retrospective methods are used after initial testing and allow researchers and stakeholders to provide feedback about intervention components after having gone through the intervention.

Community and stakeholder feedback can also be gathered in the form of a needs assessment to inform intervention design¹⁴⁸. Early incorporation of this feedback allows input

from stakeholders or target audience members to inform the design of intervention pieces at a crucial juncture before pieces are difficult to change.

3.3 Needs Assessments

A needs assessment is a systematic assessment of a population or individual's needs to determine what type and level of services are needed¹⁴⁹. In terms of chronic disease management, such as obesity, data are brought together to establish consensus regarding health concerns and strategies for addressing those concerns^{148, 149}. This may involve contextual input from target audience members in which data is collected, organized, and interpreted systematically through qualitative methodologies.

One specific way to gather needs assessment data is qualitative assessment. The purpose of qualitative data methodologies is to generate novel insights in to phenomena that are difficult to capture quantitatively¹⁵⁰. Qualitative content analysis can either be inductive or deductive¹⁵¹. Inductive is used when no previous studies dealing with the phenomenon have occurred and open coding and category creation exist. Deductive analysis is useful when testing a previous theory or if the researcher has an organizing framework or idea of what data may appear¹⁵¹. Approaches to qualitative data include grounded theory¹⁵², phenomenology¹⁵³, case studies¹⁵⁴, or ethnographies¹⁵⁵ which can use written responses, interviews, researcher notes, or any other textual expression¹⁵⁰. The result of these approaches can be a novel theory or conceptual model¹⁵⁶, themes or identified commonalities and characteristics¹⁵⁰. A directed approach to qualitative content analysis is a deductive approach that begins with some theory in mind¹⁵⁰. Thus, theory should drive the collection and analysis of data within qualitative needs

assessments. Theory also should facilitate the integration of the collected needs assessment information into interventions and guide intervention design.

3.4 Social Cognitive Theory in Intervention Design

Health behavior theories explain the relationship between specific variables that may influence human behavior and present targets for behavior change efforts^{138, 157}. One theory, Social Cognitive Theory (SCT), is a popular behavior-change theory used in nutrition, PA, and stress management interventions. SCT holds that an individual's behaviors can be influenced by external environments and through observation of others' behaviors and one's environment within the context of interactions and experiences¹⁵⁸. SCT can be used to design intervention materials and components to enhance learning through the provision of information, but also address the uptake of behaviors through the concept of reciprocal determinism. Reciprocal determinism is a main tenet of SCT that holds that a person's behavior both influences and is influenced by environments and personal factors¹⁵⁸. Through the sharing and spread of information and personal experiences, knowledge and behaviors can be enhanced. Other relevant SCT constructs include behavioral capability, outcome expectancies, and self-efficacy. Behavioral capability refers to a participant's ability to hold or change a behavior through the necessary knowledge and skills to do so¹⁵⁸. Outcome expectancies are an individual's belief of anticipated consequences (either negative or beneficial) of an action or behavior¹⁵⁸. Self-efficacy is the level of confidence a participant holds about a certain behavior or activity. These SCT constructs are proposed mediators of behavior change¹⁵⁹, and can guide intervention design and inclusion of specific strategies.

3.5 Theory-based Intervention Strategies

Intervention strategies can be applied intentionally to target SCT constructs and enhance behavior change. Examples of intervention strategies include Adult Learning Principles, guided goal setting, self-monitoring, and digital approaches.

3.5.1 Adult Learning Principles

Adult learning principles are strategies for dissemination of information that consider factors in adult learning such as motivation as well as personal experiences and self-concept¹⁶⁰. Tenets of adult learning principles within educational opportunities like workshops can be used to improve targeted behaviors. One strategy used often with community-based education efforts are the “4 A’s”. This framework been used to guide the structure and layout of intervention workshops and has been found most effective in interventions with multiple participant encounters or education opportunities¹⁶¹. This approach includes an “Anchor”, or a grounding in individual experience, an “Add”, or the inclusion of new information, an “Application”, or reflection on how this new information relates to or may be incorporated in to the participant’s life, and an “Away”, or an activity or takeaway to promote uptake of information and behavior changes discussed¹⁶². This approach is effective in packaging new information within participants’ global experience and encouraging knowledge and skill (behavioral capability) acquisition to sustain behavior change^{161, 162}.

3.5.2 Goal Setting and Self-monitoring

Goal setting is another behavior change strategy used in health interventions. It has been identified by previous literature as critical for behavior change, specifically in interventions

focusing on diet and physical activity modification for health improvement¹⁶³. According to literature in the field of task-performance, a goal is the aim or target of a specific action¹⁶⁴. Four steps have been identified in goal-setting theory as necessary for goal accomplishment¹⁶⁵. The first step is the recognition of a need for some sort of specific change. Within the scope of this project, it may include a change related to healthy eating, physical activity, or stress management. The second step is establishing a specific aim or objective to meet that change need. Monitoring for progress toward goal achievement is the third step, and self-monitoring can increase awareness, consciousness, and motivation within the participant¹⁶⁵. The final step is one of rewarding oneself for goal attainment. One such intervention with patients with chronic conditions, incorporated goal setting and SCT constructs to encourage patients to set goals, grow in self-efficacy, and gain confidence in bringing health concerns up with their primary care provider. Self-efficacy was measured using a survey, and positive increases in self-efficacy scores were found to predict patient behavior change¹⁶⁶. This shows the promising nature of incorporating SCT in goal setting interventions for health behavior change.

Three techniques used to facilitate goal setting and self-monitoring are Motivational Interviewing^{167, 168}, SMART (Specific, Measurable, Attainable, Realistic, and Timely) goals^{169, 170}, and the GROW (Goal, Reality, Options, and Way Forward) Model¹⁷¹. SMART goals have been used in the literature to guide specific goal formation and improve adherence to set goals. Through this process, goals are made specific, measurable, attainable, realistic, and timely. One study, the CHOICES study, analyzed the quality of set SMART goals among college students working on weight management¹⁶⁹. Students had difficulty setting SMART goals by themselves, but training and coaching on setting SMART goals proved to be an effective strategy in goal development and self-monitoring through the goal achievement journey¹⁶⁹.

Other studies have used models to structure goal setting like the GROW (Goal, Reality, Options, and Way Forward) model¹⁷¹, a well-tested goal-coaching session structure, to enhance realistic self-monitoring strategies with regard to goal setting. Motivational Interviewing is a counseling style that was originally used in treatment for substance abuse to encourage behavior change and improve self-efficacy by placing heavy emphasis on personal responsibility for behavior¹⁷². It has since been extended as a method for behavior change counseling in nutrition, activity, weight management, and overall health¹⁷²⁻¹⁷⁴. Alm et. al (2008) conducted a study where intervention staff use Motivational Interviewing strategies to assess the effects of goal setting on weight management in adolescents¹⁷⁴. They found Motivational Interviewing to be effective at enhancing goal setting among youth with regard to weight management¹⁷⁴. Thus, goal setting and self-monitoring represent effective strategies for behavior change interventions, and some studies have applied these strategies using digital approaches such as activity trackers¹⁷⁵, websites¹⁷⁶, and mobile applications¹⁷⁷.

3.5.3 Digital Approaches

Digital approaches to support behavior change are varied, and definitions of digital health have evolved as technologies have developed¹⁷⁸⁻¹⁸⁰. Widespread usage of the term over decades of research indicates its prevalence and potential role in intervention work and health initiatives¹⁸⁰. According to the World Health Organization (WHO), digital health approaches include concepts of electronic health, mobile health initiatives, and connected software solutions¹⁷⁸. Health professionals and public health experts are now using technologies like tablet and smartphone applications, teleconferencing systems, and social media platforms to

deliver medical consultations, monitor health goals, deliver public health interventions, and even prescribe treatments¹⁸¹⁻¹⁸³.

Various digital approaches exist including websites, activity trackers, and mobile applications. With more than 4.2 billion internet users¹⁸⁴, websites are an effective and low-cost source of health information¹⁸⁵. Some advantages include reduced personnel demands, increased flexibility and interactivity, and consistency of information delivered¹⁸⁶. Interventions using websites also allow for continuous access to research-based information about health or study content for interventions¹⁸⁷. Additionally, large populations are reachable with websites, and retention rates in studies are often improved as the dosage of a website intervention can be retrieved as needed by participants^{185, 187}. Access to the internet or internet-carrying devices (such as mobile devices such as smartphones and tablets) can be limited for certain groups, however, and motivation to login and utilize materials online even when access is not a barrier can be a challenge for others¹⁸⁶. Activity trackers, on the other hand, have become a popular means to monitor and track a variety of health data including activity levels, sleep, and even stress levels¹⁷⁵. Mobile applications are also popular strategies for monitoring PA levels¹⁷⁷, tracking diet¹⁸⁸, and even connecting with other individuals that are working to improve health¹⁸⁹. These devices often require a smart phone, tablet, or access to a computer with internet and can be a barrier for limited-resourced populations¹⁷⁷.

Digital approaches to support behavior change interventions have been used among studies to target major constructs of SCT including behavioral capability and self-efficacy. Health-related mobile applications and websites may contain goal-setting and self-monitoring strategies for users^{177, 190}. Baretta et. al (2019) found that while there is a range of goal setting options on popular PA apps, the strategy could be improved by tailoring the level of the goal to

the user's ability¹⁷⁷. Other SCT constructs potentially enhanced via digital approaches include social support and self-efficacy. Kim et. al (2017) evaluated an application-based weight loss program, and that found mobile health application platforms can be an effective way to harness social support and self-efficacy¹⁸⁹. Thus, there is evidence for the use of digital approaches as a strategy for behavior change, and can even help bridge gaps in access to health promoting content and interventions¹⁹¹.

The use of digital technologies has become ubiquitous across systems, and digital health has emerged as a cost effective and sometimes necessary means of engaging and treating populations facing barriers to healthcare access^{181, 192}. Digital health technologies provide opportunities to overcome geographical and socioeconomic barriers to healthcare access for populations living in rural, difficult to reach locations, or who are low-income^{191, 193}. These populations often face a lack of access to healthcare or limited availability and ability to practice health promoting activities but could gain access through digital approaches like websites or tablet applications^{178, 182, 194}.

These intervention methods of Adult Learning Principles, goal setting and self-monitoring, and digital approaches allow for further integration of SCT into intervention components. Intervention strategies and methods can be used to target specific behaviors or to be used within various populations, but there is a need for a framework to unite and organize theory and these strategies in intervention design.

3.6 Intervention Design and Refinement

3.6.1 Intervention Mapping

Intervention Mapping (IM) is one method for intervention development that considers the theoretical determinants of behavior change, change techniques, and the adoption and feasibility of an intervention¹⁴¹. IM is a protocol that produces a scaffold and plan for intervention development and evaluation that is grounded in theory and is evidence-based. It includes six major steps: (1) the facilitation of a needs assessment, (2) the development of change and performance objective matrices, (3) the selection of theory-based intervention components, (4) the creation of intervention components and materials, (5) awareness of how the program may be implemented and adopted, and (6) evaluation of the process and outcome of the intervention. This process provides an iterative and structured approach to intervention development. IM leads to the development of a matrix of change objectives, program components, and theory. This “map” provides researchers and those involved with program delivery a structure within which to operate. Michie et al., (2018) outlined a weakness in reliance upon theoretical determinants and called for greater involvement of stakeholders within the IM context¹⁹⁵. Here, the needs assessment is vital to address this point, and intentionality should be given to the planning and inclusion of community and expert input at various stages of intervention design¹⁹⁶.

The IM approach has been used across public health efforts to facilitate intervention design in both community and clinical settings. Examples of IM used across public health efforts include interventions to increase self-management among epilepsy patients¹⁹⁷, to increase HPV vaccinations within marginalized communities¹⁹⁸, and promote the need for

colorectal cancer screenings¹⁹⁹. Within the context of obesity prevention, IM is an effective framework for intervention design²⁰⁰⁻²⁰². One example, the Keys to Healthy Family Childcare Homes study used IM to approach children's diet quality and to increase their moderate-to-vigorous activity while in family childcare homes²⁰⁰. In another example, ten Hoor et al. (2017) used IM to develop an obesity intervention for adolescents, identifying contributors to PA and diet via a needs assessment²⁰². These examples highlight the breadth of usage of IM as well as its potential to lead to the design of robust interventions effectively targeting behavior change.

3.6.2 Intervention Refinement with the Plan, Do, Study, Act Model

Beyond IM, there are other methods for intervention refinement once an intervention has been created. Intervention refinement can be used to ensure interventions are used to achieve the greatest benefit in terms of behavior change or that they are the most effective for target audiences¹⁴⁷. The process of systematically identifying effective intervention components has been referred to as intervention optimization²⁰³, and optimized interventions have been defined as the most effective intervention given expected constraints or barriers²⁰⁴.

One method of intervention refinement and optimization is the Plan-Do-Study-Act (PDSA) model. The aim of the PDSA model is to select, identify, test, and adapt certain components of an intervention as it fits within a local context²⁰⁵. It is a form of intervention quality improvement and rapid cycle testing, used primarily within health care settings^{206, 207}. The model includes hypothesis or objective formation (Plan), implementation of some change and the collection of data (Do), the analysis of data and comparison to baseline (Study), and the alteration of a change or formation of a new change (Act). PDSA's strengths reside within in the ability of researchers to test, analyze, and discard components of an intervention or quality

improvement process that do not work within specific contexts²⁰⁸. Informed changes and enhancements to intervention or quality improvement efforts can be made in small, quick changes to provide a freedom from the burden of large, cumbersome, structural changes to interventions²⁰⁸.

With the effectiveness of IM in the development of public health interventions and PDSA model's approach to testing of intervention strategies, both present promising tools to be used in the design and refinement of interventions. Well-designed interventions can help create effective interventions and facilitate targeted behavior uptake when barriers exist through the integration of novel strategies into obesity prevention efforts¹⁴¹.

Section 4: HEROs Self-Care: Study Goal and Objectives

Obesity is a multi-dimensional problem that requires multi-dimensional and creative behavioral approaches to prevention. Despite the fact that stress has been identified as one potential contributing factor of the increase in rates of obesity^{85, 86}, obesity interventions frequently target diet and PA behaviors while rarely accounting for stress⁶. Even fewer assess the relationship between parental stress, diet, and activity behaviors and childhood obesity or propose stress-reduction techniques like self-care and mindfulness for mothers^{4, 6, 205}. More research is needed about the role of self-care in obesity prevention interventions, and more strategies are necessary to provide parents in potentially high-stress situations with coping mechanisms, like mindfulness, to engage in health-promoting behaviors. Therefore, the overarching goal of this dissertation was to design a mindful self-care intervention and investigate its feasibility and acceptability for mothers of preschoolers. This goal was addressed in 3 objectives:

Objective 1 – To develop a mindful, self-care intervention by 1a) examining mothers existing beliefs, practices, and supports or barriers relating to maternal self-care via one-on-one interviews; and 1b) use Intervention Mapping as a framework to integrate target audience input into the design of the HEROs Self-Care program. (Chapter 3).

Objective 2 - To pretest key components of a mindful self-care program for mothers of young children and examine: 1) acceptability of the intervention content; 2) suitability of the implementation strategies; and 3) feasibility of key intervention digital supports in rural communities. (Chapter 4).

Objective 3 - To describe the intentional design and final intervention components of the HEROs Self-Care program and outline the rationale for inclusion of specific behavior change strategies (Chapter 5).

Objective 4 - To summarize baseline health characteristics and target behaviors as well as to explore the feasibility and acceptability of the HEROs Self-Care program through pilot testing with mothers of preschool-aged children with limited resources and living in rural communities. (Chapter 6).

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CHAPTER 3: INTERVENTION MAPPING TO FACILITATE DESIGN OF A MATERNAL SELF-CARE INTERVENTION¹

Summary

Background: Maternal self-care, or behaviors facilitating healthy eating, physical activity (PA), and stress management practices, may play an important role in child weight status. Few childhood obesity interventions, however, consider maternal self-care and health practices. **Objective:** To develop a mindful, self-care intervention by a) examining mothers' existing beliefs, practices, and supports or barriers related to maternal self-care via one-on-one interviews; and b) use Intervention Mapping (IM) as a framework to integrate target audience input into the design of the HEROs Self-Care program. **Study Design:** Mothers (n = 19) from preschool centers in rural Colorado were recruited to participate in interviews about their self-care beliefs, practices, and supports or barriers. **Analysis:** Telephone interviews conducted by a trained researcher, were recorded, transcribed verbatim, coded, and analyzed using an iterative approach and were used to inform the IM process. The key findings were organized by domains of interest: beliefs, practices, supports and barriers. **Results:** Mothers had varying definitions of self-care and contexts in which self-care strategies were used. The majority of participants described self-care practices as important for helping them be a better mom but reported infrequent practices of self-care. Barriers such as time, access to healthy food options or facilities for PA, and exhaustion made incorporation difficult in daily life. This input guided IM for the development of the Healthy EnviROnments (HEROs) Self-Care program which includes 2 workshops, 4 remote health coaching sessions, and digital supports. Topics addressed include

¹ The contents of this chapter will be submitted for publication as a manuscript.

what defines self-care, how to incorporate self-care behaviors into a busy life, and goal setting for health. **Conclusion:** Understanding mothers' existing self-care practices and beliefs provided insights to inform and guide the development and refinement of a self-care intervention using IM.

Introduction

Obesity has continued to be a major health issue for adults and children in the United States¹, and negative health effects of obesity in youth can persist into adulthood². Women of childbearing age are particularly vulnerable for overweight or obesity and related diseases³, with 54% of overweight or obese women being of childbearing age⁴. Poor dietary, PA, and stress management behaviors are strongly related to weight status, yet American adults are not meeting national dietary and PA recommendations^{5, 6}. Beyond weight status and obesity-related behaviors, studies have shown that cardiovascular disease (CVD) risk factors (e.g. hypertension or hyperglycemia) may be related to child weight status^{7, 8}. A cross-sectional study of obesity-related risk factors found a high prevalence of CVD risk factors among mothers of preschoolers in rural Colorado communities and that these risk factors were positively related to both maternal and child weight statuses⁹. Thus, weight status and weight related behaviors present challenges for women of childbearing age.

With rates of obesity and obesity-related diseases continuing to rise, and with weight-related behaviors a challenge for women of childbearing age, the family system and home environment are targets for obesity prevention efforts. This premise is in alignment with ecological and systems-focused understandings of influences on behaviors, such as diet and physical activity (PA) that may contribute to increased rates of obesity¹⁰⁻¹². Parental healthy eating^{13, 14}, physical activity (PA)¹⁵, and stress management behaviors^{16, 17}, specifically in mothers, are related to

child weight status. Among energy-balance behaviors, mothers play a significant role in their children's food-intake^{14, 18} and PA levels^{19, 20}, and maternal weight and cardiovascular health has been linked with child weight status⁹. Maternal psychological stress also plays an important role in maternal weight-influencing health behaviors, and maternal weight status^{21, 22} and has been linked with child stress and obesity^{17, 23}. Maternal stress may stem from a number of factors, especially in the preschool years. Crnic & Low found that stress among parents of preschoolers could stem from contextual factors, child-specific traits, bids for autonomy, emerging preferences, and emotional reactivity often exhibited by young children^{24, 25}. Because mothers act as gatekeepers for diet, PA, and stress management practices in the home environment, they are a critical audience to intervene with in childhood obesity interventions.

Challenges to practicing healthy diet, PA, and stress management behaviors are high, particularly for mothers of young children. When it comes to feeding the family, Bekelman et al. reported that employment schedules, management of preschooler behavior, and for those living in rural areas, social isolation, were among barriers reported to impact family routines²⁶. In terms of PA, time constraints, guilt, family obligations, and physical limitations or being out of shape may act as potential barriers to PA practice^{27, 28}. With stress and stress-management, contextual factors, child-specific behaviors, and busy schedules can cause stress and challenges, as well²⁴. Focusing on maternal health, including lifestyle behaviors such as diet, PA, and stress management, is a critical component to addressing childhood obesity.

Work has been done to address stress as a part of obesity interventions, both to understand how stress may impact participation in interventions²⁹ as well as to target stress management to improve diet and PA behaviors¹⁶. Jastreboff and colleagues (2018) piloted a parental stress management intervention to decrease risk for childhood obesity in a lower-income population¹⁶.

The purpose of this intervention was to assess the feasibility of including a stress management component in obesity interventions, and researchers promoted healthy eating and PA within the family unit alongside promoting parental stress management in family interactions¹⁶. In work like this, maternal stress management to impact child diet and PA, shows promise as an effective obesity intervention strategy.

One possible strategy to promote stress management and maternal health is self-care. Self-care, or any health-promoting activities performed to maintain personal well-being throughout life^{30, 31}, has gained popularity in modern culture for stress management, but few obesity interventions consider self-care, especially in the family context. One form of self-care is the practice of mindfulness, a strategy to improve physical and mental well-being^{30, 31} through awareness or awareness of internal needs and external demands as well as intentional practice of health promoting activities to meet one's needs and promote one's wellbeing with kindness³². Self-care and mindfulness may be used as an approach to healthy eating and PA behaviors, and because maternal behaviors are so related to child behaviors and outcomes, maternal self-care and mindfulness may play a role in family obesity interventions. However, there is a dearth of information about how mothers perceive self-care, barriers mothers face to self-care, or if self-care may be acceptable to mothers in obesity prevention efforts.

There is also a need for theory-based interventions that make use of self-care strategies to target maternal health outcomes and ultimately child weight status, however more insight from mothers on the facilitators and barriers to self-care is needed to inform potential intervention opportunities. Therefore, the goal of this study was to develop a mindful self-care intervention for mothers of preschoolers with limited resources living in rural areas as a program of the Healthy EnviROnmentS (HEROS) Study, a childhood obesity intervention. The two objectives

were to: (1) interview mothers to understand existing beliefs, practices, and supports or barriers related to maternal self-care; and (2) use Intervention Mapping as a framework to integrate target audience input into the design of the HEROs Self-Care program.

Methods

Telephone Interviews

Study Design

Qualitative methodology was employed to collect, organize, and interpret contextual circumstances related to maternal self-care. A theory-driven approach to qualitative content analysis was used to understand existing beliefs, practices, and supports or barriers related to self-care. Interviews were chosen as a qualitative method in order to better understand individuals' lived experiences in the phenomenon of self-care. The underlying theory was Social Cognitive Theory (SCT), which guided the interview script development as well as the directed content analysis. The institutional review board at Colorado State University approved this study (Appendix I).

Participants and Setting

Purposive sampling was employed to generate data. Mothers were recruited from 5 Head Start and preschool centers in Eastern Colorado. Eligibility criteria included being a primary caregiver to a preschool-aged child, being over the age of 18 years, and an English speaker. Interest forms, including demographic information, were sent home in student backpacks and returned to the school. Forms were retrieved from the school, and 51 interested mothers of

children aged 3-5 years were contacted by phone or email, resulting in 19 phone interviews. All those that completed the phone interview in Spring 2019 received \$20.

Interviews

A semi-structured interview guide was developed to understand existing beliefs, practices, and supports or barriers related to self-care topics related to stress management, healthy eating, and physical activity (PA). Constructs of Social Cognitive Theory (SCT) were applied to ascertain supports (relatedness) and barriers to self-care, behavioral capability, outcome expectations, and self-efficacy. To establish content validity, experts (n=3) in nutrition, PA, mindfulness, parenting, and qualitative research methodology reviewed the guide for their respective content area as well as clarity and flow of questions. Face validity was established via pilot interviews with a convenience sample of mothers of preschoolers (n=4). Minor modifications to the guide included the ordering and wording of questions to improve flow, context, and understanding. The final interview guide consisted of 22 questions and prompts (Appendix II). Table 3.1 provides sample questions by SCT construct and topic.

Table 3.1. Operational Definitions by Social Cognitive Theory (SCT) Construct and Sample Questions about Maternal Self-Care Practices

SCT Operational Definition	Interview Question
Behavioral Capability Knowledge and skills to perform self-care activities	When you hear the term self-care, what comes to mind? What types of things do you do to take care of yourself?
Outcome Expectations Beliefs and anticipated outcomes about regular self-care practice	How does or doesn't your self-care relate to your family? To your child?
Self-efficacy Confidence in ability to practice self-care and overcome barriers	How confident are you in using these strategies or resources to manage your stress/ to eat healthy/ to be physically active?
Social Support/Relatedness Extent to which others (peers, family members, significant others/spouses) approve of or encourage self-care behaviors	Are there friends or family that help encourage you to take care of yourself?

Interviews were conducted by a trained researcher³³, were audio recorded, and had a note taker present. Informed consent was gathered prior to the initiation of the interview, and mothers received \$20 for participation. A report for each participant was collated including information on timing, setting, notes and verbatim interview transcriptions (Datagain Services, 2017).

Analytic Approach

A directed approach was used to analyze the qualitative content of the interviews³⁴. A deductive process assessed the congruence between interview responses and major constructs of SCT. Two researchers reviewed the interview guide independently and repeatedly to inform the development of initial codes for a preliminary codebook. These two researchers then reviewed and coded one pilot transcript to develop individual preliminary codebooks, including overarching categories and specific codes to capture emerging content. Code definitions and inclusion/exclusion criteria were developed. A second pilot transcript was then coded

individually to finalize the preliminary codebook to share/discuss with third research team member who served as an auditor for reviewing codebooks and addressing discrepancies among codes.

Three researchers used a consensus process to determine the final set of codes and codebook. This consensual process allowed for intercoder reliability to be determined via verbal consensus among coders^{33, 35}. Additionally, coders met consistently to discuss discrepancies, resolve differences in coding, and to negotiate a consensus as a part of a constant comparative method³⁶. Two coders then utilized the final codebook to independently read through and code transcripts, identifying text segments (quotes) to support each code and identify major themes. NVivo qualitative software (QSR International Pty Ltd. Version 12) was used for this coding process. Intercoder reliability was then assessed.

Application of Intervention Mapping Framework

Findings from the telephone interviews for Aim 1 informed the IM for the HEROs Self-Care intervention. IM includes six major steps: (1) the facilitation of a needs assessment, (2) the development of change and performance objective matrices, (3) the selection of theory-based intervention components, (4) the creation of intervention components and materials, (5) awareness of how the program may be implemented and adopted, and (6) evaluation of the process and outcome of the intervention. This process provides an iterative and structured approach to intervention development, and yields an intervention that is grounded in theory, evidence, and best practice using formative work³⁷.

Step 1 of IM involved a needs assessment that was informed by the interviews with mothers of preschool-aged children conducted in Aim 1; synthesis of findings from the HEROs

study formative research, specifically ecocultural family interviews ²⁶ and a cross-sectional study of maternal CVD risk and child weight status⁹; and review of relevant literature. After Step 1, performance objectives and determinants of behavior change were drafted for stress management, healthy eating, and PA. Interviews with the target population ensured that appropriate and relevant health determinants were included in the intervention. These health determinants were then matched with theoretical constructs from Social Cognitive Theory and compiled in a matrix (Appendix III) ^{37, 38}.

In Step 3, to address the selected health determinants, behavior change strategies were identified, grounded in Social Cognitive Theory and best practices to enhance stress management, healthy eating, and PA. Motivational Interviewing ³⁹, adult learning principles ⁴⁰, Ecological Momentary Assessment (EMA) ⁴¹, and health coaching strategies ⁴² framed health determinants. For Step 4, intervention materials were drafted based on input from Steps 1-3. Feedback from participants and the research team were used to draft as well as make revisions. Three Plan-Do-Study-Act (PDSA) cycles were performed to inform modifications to program content, delivery methods, and digital supports (Chapter 4). These PDSA cycles allowed for the modification and refinement of behavior change strategies from Step 3 and materials from Step 4. In Steps 5 and 6, an implementation plan was developed in tandem with a conceptual model (Chapter 5).

Results

Telephone Interviews

Of the 19 participants, 58% self-identified as Hispanic or Latina (n = 11). Additionally, 80% of participants were married or living with a domestic partner (n = 15), with 44% (n = 8) working full-time and 22% (n = 4) working part-time. On average, 61% (n = 11) of participants reported their household income to be at or below 185% of the federal poverty level (Federal Register, U.S. Department of Health and Human Services, 2020). Most mothers, 83% (n = 15), had some college or technical school education. Interviews were conducted in April 2019 and lasted an average of 35 minutes. To accomplish member checking³³, a summary of each interview was both emailed and mailed to the participant with information on how to get in touch with researchers to confirm, edit, or add to the existing interview. The *a priori* expectation was that saturation would be reached with 20 interviews, and through the constant comparative process, saturation was reached at 19 interviews⁴³. As the final sample was reached, latter interviews provided no new insights.

The key findings were organized by domains of interest: *beliefs*, *practices*, *supports*, and *barriers* of and to self-care. The *beliefs* domain included any intrapersonal views or expectations driving or halting self-care as well as self-efficacy and mindfulness behaviors. The *practices* domain focused on interpersonal and external factors playing a role in participant behavioral capability. The *supports* and *barriers* domains revealed further contextual and environmental influences on maternal self-care. Table 3.2 provides a summary of themes, their corresponding SCT constructs, supporting quotes by theme as well as considerations for intervention activities.

Table 3.2. Supporting Quotations for Emergent Themes and Subsequent HEROS Self-Care Intervention Considerations

Domain: SCT Construct or Determinant	Theme	Quotation	Summary Intervention Considerations by Theme
<u>Beliefs</u> Outcome Expectations	Mothers believe self-care promotes and supports personal health (mental and physical) and family health (interactions, physical, and mental) by role modeling healthy behaviors.	<p>“I think it helps the family dynamic, because you're rejuvenating yourself...if you don't take those things you're more irritable and you get overwhelmed easily and just your attitude is different.”</p> <p>“If I have really, really poor eating habits those would definitely be reflected on to my kids. I feel like that’s really important to keep in mind that whatever you’re doing you’re teaching your kid.”</p> <p>“I want to be healthier, I do. I want to do things with my kids and keep up with them. Sometimes I feel tired and I can't keep up I'm like, “Oh, I'm going to go to bed, if they want to do all these things, I can't keep up, so I mean I make those choices, 'cause I want to be better for myself and for my kids so they can have a mom around them.”</p>	A self-care intervention should target holistic and whole-body wellness and include activities for mental and physical health.
Mindfulness	Self and contextual awareness is important for self-care practices.	<p>“It (Self Care) helps me stay less stressed and more centered and able to be in the moment and be with my kids rather than having so much anxiety, having so much stress and just being super busy. I feel it just helps me be able to be more present.”</p> <p>“It falls back on yourself with that mindfulness that you just have to plan your schedule and then try to take your time to breathe and different things...I think it's really a plan of what you're gonna do when you need some help.”</p>	Mindfulness and mindful tenets would be well received components of a self-care intervention.
Self-efficacy	Confidence in adequate self-care practices can be situational and influenced by multiple factors.	<p>“I would say I'm pretty confident, but that there's always those days where you just don't want to do nothing.”</p> <p>“A lot of people in my position would just give up or just not even care. It gets to me how some can just give up and being parents you know. I’m blessed to even be a mom, being alive. I’m very grateful for what’s going on.”</p>	Discussions on what to do in the face of self-care barriers to improve self-efficacy are warranted.

Table 3.2. Supporting Quotations for Emergent Themes and Subsequent HEROS Self-Care Intervention Considerations

Domain: SCT Construct or Determinant	Theme	Quotation	Summary Intervention Considerations by Theme
<u>Practices</u> Behavioral Capability (skills)	Mothers strive to incorporate healthy behaviors in their daily lives and use strategies to overcome barriers to engage in healthy behaviors.	<p>“Time management is an issue for me. I’ve always struggled with that, but I tried to work on it, but it does not (work).”</p> <p>“If I’m too stressed, I need to just back away from the whole situation, either going into my room or going into the bathroom and just taking a few seconds to myself.”</p>	<p>Mothers are aware of the benefits of self-care, and an intervention might focus on skill-building for self-care practice.</p> <p>Materials should meet mothers where they are at in self-care practice with a variety of options, tips, and recommended skills.</p>
Behavioral Capability (knowledge)	Stress management, healthy eating, and PA knowledge and skills are critical for self-care.	<p>“Self-care is taking care of yourself ...because you take care of everyone else and everyone is always there for you, but then you also need time to take care of yourself to unwind, to do what you like to do.”</p>	The intervention could include topics of time-management and knowledge of basic self-care practices.
Supports Social Support/Relatedness	A supportive family dynamic and social support are critical for self-care.	<p>“Sometimes in summer I spend as much time as I can outside. We [the family] go fishing and we go hiking and that’s usually my self-care routine.”</p> <p>“I have family around, but they’re not super close. Sometimes it’s hard if my husband works a ton. He can help to a point, but not always.”</p>	Self-care activities may focus on skills to help mothers find time and supports for their own care and include ideas on activities that can be done with their children or as a family.

Table 3.2. Supporting Quotations for Emergent Themes and Subsequent HEROS Self-Care Intervention Considerations

Domain: SCT Construct or Determinant	Theme	Quotation	Summary Intervention Considerations by Theme
Barriers Barriers	Mothers' food-based decisions and PA behaviors are typically prioritized behind children's eating and PA behaviors.	"Trying to get the kids back and forth to different activities when it's only myself or after we're completely done with the day if there wasn't a plan for dinner what I'm going to do or trying to feed them all when they're at different places."	Mothers are busy, and intervention meetings will need to be flexible and accommodate the schedules of each participant.
	Prioritization of others over self and exhaustion (mental and physical) are leading barriers to self-care.	<p>"I mean, that one is tricky, just because I'm constantly taking care of everybody 24/7. If I'm not taking care of the kids, I'm taking care of their dad as well."</p> <p>"Part of being a new mom and being a young mom I felt I had to take the best care of my kid to show that I was a really good mom...but no matter how hard I tried to be the best mom, you can only be as best as you can be without –like once your cup is empty your cup is empty."</p>	Mothers often prioritize others over self and intervention activities should acknowledge this.
	Resources and access impacts mothers' engagement in self-care.	"I just saw that they had an ad for Zumba classes and stuff and I would love to do that, but most places here, they don't have childcare services when you're working out."	Intervention workshops need to offer childcare.

Beliefs

Outcome expectations, mindfulness, and self-efficacy emerged from the data as key SCT constructs in terms of self-care beliefs. With outcome expectations, most mothers believed that self-care promotes personal health and improves interactions with their families. In general, mothers found engagement in self-care behaviors to be valuable and reported expectations for self-care to benefit themselves as well as the whole family, whether that be from improved maternal mood and decreased stress levels or shared, familial self-care experiences. There were, however, reported feelings of guilt toward using time to prioritize their own self-care in the midst of other family obligations and expectations. For example, one mother described the balance of prioritizing her own self-care with her family's needs:

“I think mothers just give so much to their families...it's really hard to make that time and then if there is a few minutes there, you'll give it up to whatever your children need.”

In terms of mindfulness, awareness appeared as an emergent theme, including mention of awareness of how self-care made mothers feel (e.g., mothers felt calmer and less stressed after self-care) and awareness of how often self-care was or was not prioritized within schedules (and how stress built up if longer periods of time had gone by with no self-care). Additionally, mothers expressed awareness of how past experiences or examples (in childhood) of self-care may influence their current practices such as diet or PA behaviors learned in childhood shaping practices as an adult. Confidence, or self-efficacy, to practice self-care was reportedly influenced by the presence of supportive systems (e.g. supportive spouses or extended family), contextual situations (e.g., the weather or children's schedules), or awareness of previous experiences and outcomes from self-care practice.

Practices

Mothers strived to incorporate healthy behaviors into their daily lives, and behavioral capability plays a vital role in the practice of self-care. Many mothers were knowledgeable about the relationship between stress management, healthy eating, and PA with overall wellbeing and health. Many mothers identified self-care as beneficial for themselves, but found barriers (limited time, stress, busy schedules, etc.) difficult to overcome. For example, one mother explained:

“It's a struggle. Over the past week I've been really stressed out. I've had a hard time this last week, so I haven't eaten the best.”

Skills mentioned in reference to practiced self-care included time management, planning, and prioritizing. Many mothers reported a desire to improve skills related to time management and planning in order to better prioritize self-care practice.

Supports and Barriers

There are various supports and barriers that make up a mother's contextual and cultural situation for self-care practice. In general, spouses and family members were a source of support for self-care practices, and mothers valued support from other mothers that share a common experience of raising children. One mother explained:

“...I was just talking to another mom at the same school that my daughter goes to...she's overwhelmed and it's just a lot for her...and she's like, “I'm so tired” and I was like, “I feel the same way” and so we just had a conversation for like 15-minutes about that self-care and what to do.”

Prioritization of the needs of others and the busyness of schedules were leading barriers to self-care. Contextual barriers in rural environments included seasonal factors related to

children's activities, a lack of access to childcare or indoor PA facilities, and the weather preventing outdoor activities.

IM Strategies for Intervention Development

Feedback from interviews from Aim 1, in conjunction with previous HEROs study formative research findings, informed the design of intervention strategies including stress-management and mindfulness themes and activities²⁶. Step 1 confirmed the need for an intervention enhancing skills to practice stress management, healthy eating, and PA with mindfulness and improve self-efficacy related to self-care, while drawing upon the positive expectations mothers have about self-care practice and awareness mothers have of the supports and barriers of their realities.

Next, key performance objectives were developed in Step 2 for 3 core program foci - stress management, healthy eating, and PA. Performance objectives focused on improved overall diet quality, increased time spent in moderate to vigorous PA each week, and managed perceived stress by incorporating mindfulness and self-care activities into daily schedules. These performance objectives focused on health determinants of behavioral capability, self-efficacy, expectations, mindfulness, and goal setting, and self-monitoring. For example, behavioral capability determinants stipulated that the participant gain knowledge and skills to manage perceived stress, healthy eating, or PA using self-care techniques. Another example is the identification of self-efficacy determinants aiming to improve feelings of confidence about using self-care techniques to manage perceived stress, improve diet quality, or increase time spent active.

In Step 3, strategies for addressing key performance objectives and determinants of change, were compiled (Table 3.3), grouped by program content, and resulted in a 6-week HEROs Self-care Intervention with 3 major elements: in-person workshops, virtual health coaching sessions, and digital supports (website and applications on an iPad). Health fairs bookended the delivery of the program and served as a venue to both meet participants face-to-face and to collect evaluation measures. Results from the health fair (cardiovascular disease risk factors and diet and activity comparing to recommendations) provided personalized information to participants to guide coaching discussions. An initial in-person workshop followed the baseline health fair to introduce participants to self-care and mindfulness topics. The following 4 weeks included virtual, individual health coaching sessions on 4 main topics: goal setting for self-care, stress management, healthy eating, and PA. An ending in-person workshop to discuss the development of a self-care plan concluded the program.

Table 3.3. Strategies and Determinants by HEROs Self-care Intervention Program

Program Element	Determinant	Material/Modality	Description
Content	Behavioral capability	Handouts and Facilitator Scripts	<ul style="list-style-type: none"> • Facilitator scripts for 2 workshops and 4 health coaching sessions on stress management, healthy eating, and PA in self-care • Handouts for participants with information about goal setting, stress management, healthy eating, and PA
Delivery Methods	Mindfulness, outcome expectations, social support	Group Workshops	<ul style="list-style-type: none"> • 2 group workshops • Topics included an introduction to self-care and mindfulness and the development of a self-care plan
	Mindfulness, goal setting, self-monitoring, self-efficacy, and social support	Individual Health Coaching	<ul style="list-style-type: none"> • 4 virtual and individual sessions • Topics included goal setting, stress management, healthy eating, and PA
	Health information (behavioral capability)	Health Fair	<ul style="list-style-type: none"> • Designed for collection of evaluation measures • Provide personalized health information to participants
Digital Supports	Mindfulness, self-monitoring	Activity Tracker	<ul style="list-style-type: none"> • Provide real-time feedback on PA and stress to participants using a step counter and stress tracker function
	Behavioral capability	Tablet	<ul style="list-style-type: none"> • Provide access to information about goal setting, stress management, healthy eating, and PA
	Behavioral capability	Study Website	<ul style="list-style-type: none"> • Provide access to information about goal setting, stress management, healthy eating, and PA
	Mindfulness and self-monitoring	Text Messages	<ul style="list-style-type: none"> • Gather EMA responses about momentary stress management, healthy eating, and PA • Prompt participants to be mindfully aware

Step 4 included the development and refinement of program-specific materials with target audience and expert input and feedback. These details were refined using Plan, Do, Study, Act (PDSA) cycles (Chapter 4). This process targeted the refinement of program components of

content (i.e., addition of mindfulness activities to materials to better demonstrate the concept), implementation strategies (in-person and videoconferencing meeting on an iPad as well as duration of meetings), and digital supports (website, iPad applications, and an activity tracker). In Steps 5 and 6, implementation and evaluation plans were completed largely in tandem to ensure the development of a program that could be implemented and evaluated in a rural setting with undue burden to participants. A program implementation timeline was created with workshops, coaching sessions, and evaluation timeframes. These IM steps also led to the creation of a conceptual model (Figure 3.1).

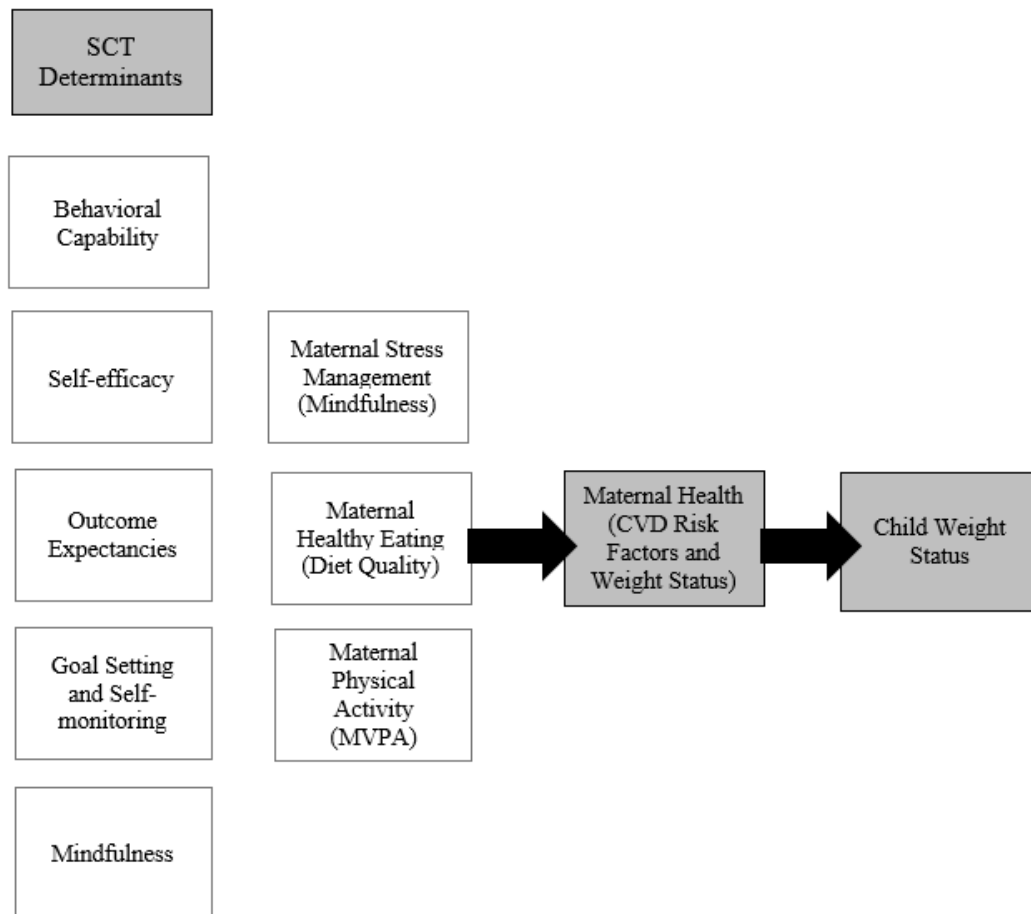


Figure 3.1. Conceptual Model for HEROs Self-care Program to Target Maternal Health Behaviors as a Strategy for Childhood Obesity Prevention Efforts

SCT: Social Cognitive Theory; MVPA: Moderate to Vigorous Physical Activity; CVD: Cardiovascular Disease

Discussion

This study outlined the IM processes used to develop the HEROs Self-Care intervention with input from the target audience about their beliefs, practices, and supports or barriers related to maternal self-care. Interviews with mothers of preschoolers revealed that self-care is desirable and an acceptable topic to be used in obesity interventions. These interviews informed the IM process, yielding a robust and comprehensive intervention program built with theory, evidence-based behavioral strategies, and target audience input. Interviews provided key information about the family context and illustrated the need for specific strategies to overcome barriers to practice self-care in family settings. This led to the incorporation of self-care skill building and practices to address barriers instead of only targeting increased motivation for or knowledge of self-care practice. Deliberate integration of target audience input and well-designed strategies and systematic approaches to intervention development like IM can increase the likelihood of potential behavior change⁴⁴.

Among the target audience input, one key theme that emerged as a result of the interviews was that most mothers believed self-care to be important and that it promotes personal health, role modeling of healthy behaviors, and improves interactions with their families, but indicated that barriers make up contextual situations for self-care practice. Barriers such as time constraints, exhaustion, and family obligations were mentioned as limiting factors to self-care practice. As such, self-care among mothers is often not prioritized despite knowledge and value of its benefits in the family setting. Additionally, stress was mentioned as a key barrier to healthy diet and PA behaviors in the presented interviews. There are stressors associated with motherhood such as challenging behaviors on behalf of the child and parenting concerns^{24, 25}, and acknowledgement of these as barriers to self-care practice might be used as a focus in self-care

interventions. Previous interventions have demonstrated that it is feasible to target maternal healthy eating, PA, and stress management in childhood obesity interventions^{16, 45, 46}. Jastreboff et al. piloted a parental stress intervention to decrease risk for childhood obesity with low-income parent-child dyads¹⁶. This pilot program tested an 8-week mindfulness-based parental stress group with nutrition and PA counseling¹⁶. The present study explored the use of the term “self-care” to describe maternal behaviors in an intervention, explored what mothers of young children in rural settings might want in a self-care intervention, and used best practices in intervention design through IM.. Mindful self-care will add an additional level of support for maternal health and wellness from what has been done previously.

Well-designed interventions paired with target audience input are vital to approaching behavior change. Key ingredients in intervention design include decisions made about behavior change strategies to be used, theoretical frameworks, and basic findings in formative work used to further inform design⁴⁷. Similarly, effective intervention development requires attention to the outlining of clear behavior change outcomes and evidence-based designs^{37, 47}. Involvement of stakeholders and target audience members in development of an intervention can also improve its implementation; the adaptation, fidelity, and sustainability of an intervention and subsequent translation into practice⁴⁸. While IM has been utilized as a framework to integrate behavior change strategies and theory in to interventions, critics have claimed that IM relies heavily on theoretical constructs and may not readily incorporate input about where participants are in terms of that behavior change (e.g. motivation to perform a behavior vs. knowledge or skills)⁴⁹. In addition to this potential limitation of IM for this particular intervention, not much is known about mothers’ beliefs, practices, supports and barriers to self-care in a rural environment. Thus, interviews comprised a large portion of the needs assessment step of IM, taking in to account

facilitators and barriers of maternal self-care. This information was vital for the inclusion of audience-specific behavior change strategies to increase self-care practice as well as the overall design of the HEROS Self-care intervention. More research could inform the assessment and refinement of specific behavior change strategies using target audience input after such robust planning protocols like IM to further tailor intervention components to target audience members.

Limitations of this research existed. While interviews were representative of the community in rural Colorado with 58% of participants identifying as Hispanic or Latina, the information garnered may not be readily generalizable to other populations and there likely are cultural-specific experiences and contexts represented here. While this is appropriate in intervention development for these audiences, the HEROS Self-Care project will need further refinement to meet the needs of other populations. Additionally, mothers that responded to recruitment efforts may have already been interested or invested in self-care. Target audience input may not reflect those that were less enthusiastic about self-care. Strengths of this research include the consideration of maternal self-care in obesity research, especially after identifying self-care as an acceptable concept to mothers in rural settings. Additionally, this work considers stress and its impact on diet and PA behaviors in a family context.

Conclusion

This study presented a systematic approach used to garner target audience input about diet, PA, and stress management in maternal self-care intervention design. Because of the information provided in the interviews, skills necessary to recognize and work around barriers to practice self-care were included in the intervention design as behavior change strategies. Robust planning frameworks that incorporate target audience input, theory, and evidence-based behavior

change strategies can be set up to optimize components and test feasibility. A maternal self-care intervention offers a unique approach to childhood obesity prevention efforts as maternal self-care may play an important role in child weight status, and thus should be considered as an approach to prevent childhood obesity. Future research should involve target audience input in the assessment of specific intervention components and eventual feasibility pilot testing.

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CHAPTER 4: USING PLAN, DO, STUDY, ACT CYCLES TO IMPROVE A MATERNAL SELF-CARE INTERVENTION WITH AUDIENCE INPUT²

Summary

Background: Maternal self-care, including healthy eating, physical activity (PA), and stress management behaviors, is influenced by environmental, social, and individual factors. There is a need to consider socioecological influences in behavior change interventions to fit audience-specific contexts. Plan, Do, Study, Act (PDSA) Cycling, a quality improvement process using rapid cycling to refine interventions, is an effective method. **Objective:** To pretest components of a mindful self-care program and examine: 1) acceptability of content; 2) suitability of implementation strategies; and 3) feasibility of digital supports with mothers of preschool-aged children in rural communities. **Study Design:** Components of HEROs Self-Care were assessed using six iterative PDSA cycles during program development (Stages 1-3) to inform refinement of content (Cycle A), implementation strategies (Cycle B), and digital supports (Cycle C). Stages included: 1) a group discussion with an expert panel (n = 8), 2) brief interviews and group discussion with a convenience sample (n = 5), and 3) in-depth interviews with the focus population (n = 6). **Analysis:** In-depth interviews were transcribed and analyzed using a directed approach, data were compiled from group discussion notes and assessed for congruence, and cycle input was analyzed for emergent themes. **Results:** PDSA cycles relating to content (Cycles 1A-3A) led the addition of activities to introduce mindfulness and foster social support and the revision of handouts. Implementation strategies (Cycles 2B-3B) were refined in workshop duration, activity order, and meeting type. The digital supports (Cycle 3C)

² The contents of this chapter will be submitted for publication as a manuscript.

were refined in the study website and tablet applications. **Conclusion:** Intervention optimization with PDSA cycles prior to full-scale implementation can potentially save resources and result in more effective interventions that consider socioecological factors influencing behavior change.

Introduction

Adult obesity rates have continued to rise since the 1980s¹, with more than half of women of childbearing age being overweight or obese². Obesity prevention efforts have long targeted physical activity (PA) and dietary behavior change³, and maternal diet and PA behaviors have been linked with child diet and PA, making the family context an important target in childhood obesity prevention. Barriers to health promotion across systems and contexts, however, exist.

Mothers of young children may face environmental, family, and individual factors influencing healthy diet and PA behaviors, including child mealtime behaviors and family dietary preferences⁴, and time constraints, feelings of guilt, and physical limitations for PA practice⁵. Factors specific to rural environments such as financial and time constraints, and health resource access, and stress may also influence healthy diet and PA behaviors⁶. As an individual factor, maternal psychological stress can impact diet and PA behaviors and subsequent weight status⁷, and mothers of young children report high levels of stress related to the family system⁸. To understand the impact of these socioecological factors, well-designed interventions could integrate effective strategies to target underserved populations and consider audience-specific supports and barriers to health behaviors⁹.

Mindful self-care, an integration of mindfulness traditions and self-care practice, is an emerging strategy in obesity prevention¹⁰. Mindful self-care incorporates mindful awareness of personal needs into care for the self and promotion of health and wellness and has its roots in

mindfulness-based stress reduction programming¹⁰. It includes strategies like mindful breathing practices, mindful awareness of emotions or feelings, and mindful intentionality toward care for one's mental, relational, emotional, and physical needs¹⁰. Though it has not been widely studied as a strategy in maternal obesity prevention interventions, mindful self-care may be a promising strategy for the promotion of healthy diet, PA, and stress management behaviors in the family context.

When developing a multicomponent intervention, employing a sequenced approach to identify both promising and less effective components prior to engaging in a full clinical trial can help optimize the final intervention¹¹. Examples of optimization strategies include exploring feasibility and acceptability of intervention strategies with members of the focus population¹¹, testing effectiveness and cost-effectiveness of different intervention components, and reviewing potential barriers to implementation and uptake of desired health behaviors¹². Optimization approaches can help prevent audience-specific barriers that lead to “dead” or obsolete intervention components and may enhance intervention effectiveness¹³.

Plan-Do-Study-Act (PDSA) is one such optimization model, grounded in the Model for Improvement¹⁴. The aim is to select, identify, test, and adapt components of an intervention to fit within a local context¹⁴. It is a form of quality improvement and rapid cycle testing, used primarily within healthcare settings, though some research studies have used it¹⁵. The model includes objective formation (plan), introduction of a small change and the collection of data (do), the analysis of subsequent data (study), and the alteration of the change or formation of a new change based on the data analysis (act). Informed changes to quality improvement efforts can incorporate stakeholder feedback and be made in small, quick cycles to provide a freedom from the burden of large, cumbersome, structural modifications to interventions¹⁴.

The objective of this study was to assess components of a mindful self-care program aimed to improve obesity-related behaviors for mothers of young children through PDSA cycles by examining: 1) acceptability of the intervention content; 2) suitability of the delivery methods; and 3) feasibility of intervention digital supports in rural communities.

Methods

As a part of the Healthy EnviROnmentS (HEROS) Study, a childhood obesity intervention designed to promote healthy eating and PA behaviors in families of preschoolers¹⁶, a program entitled HEROs Self-Care was developed. Components of the HEROs Self-Care program were assessed using six iterative PDSA cycles during program development (Stages 1-3) to inform refinement of program content (Cycle A), implementation strategies (Cycle B), and digital supports (Cycle C) (Figure 4.1).

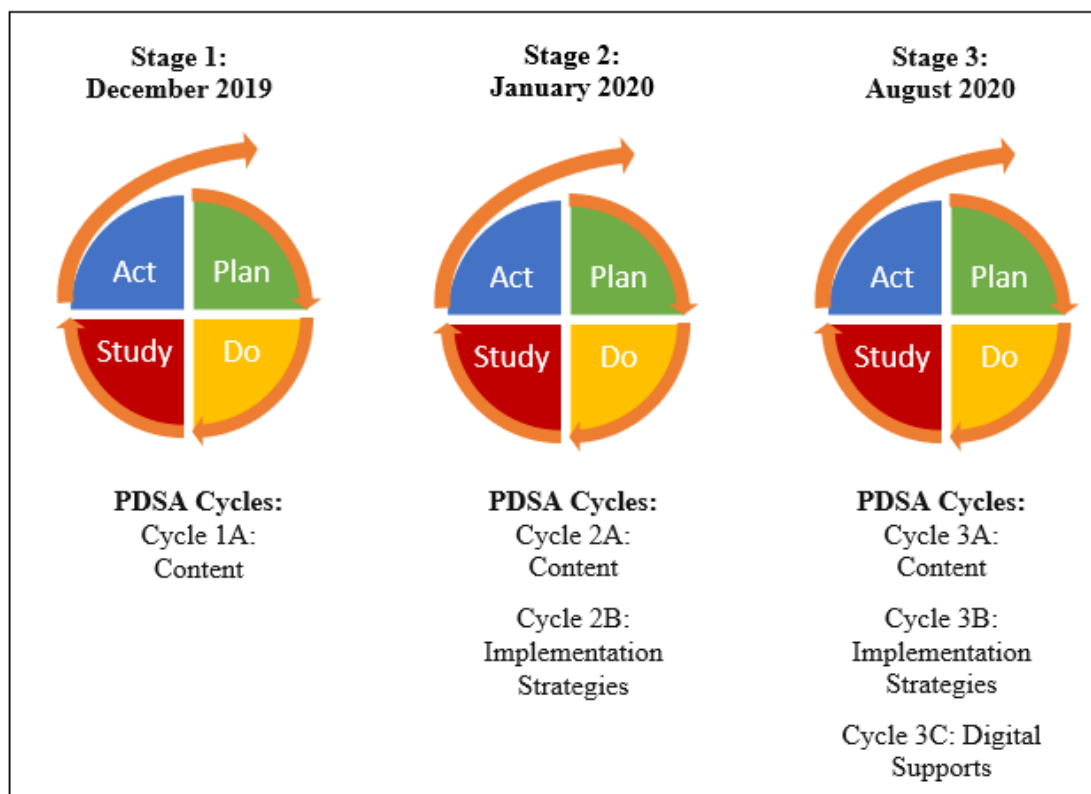


Figure 4.1. Summary of Plan-do-Study-Act (PDSA) Cycles by Stage and Intervention Component for the HEROs Self-Care Program

Summary of six PDSA cycles listed by stage (1-3) for program content (A), implementation strategies (B), and digital supports (C); timeline of events included

The HEROs Self-Care Intervention

The objective of the HEROs Self-Care intervention was to promote maternal mindful self-care behaviors to improve their diet quality, PA, and stress management practices. Intervention Mapping (IM)¹⁷ steps and Social Cognitive Theory (SCT) constructs (e.g., behavioral capability, self-efficacy, and outcome expectancies), in conjunction with goal setting and self-monitoring, served as the foundation of the intervention and guided development of intervention content and materials. The intervention was designed to be implemented over six weeks, beginning with a group workshop, followed by four weekly, individual health coaching sessions delivered through videoconferencing (Zoom Video Communications Inc., San Jose, CA,

2020) and concluding with a second group workshop. Intervention materials were loaded on a study issued tablet (iPad 6th generation, Apple Inc., Cupertino, CA, 2018). The two workshops were designed to last 1.5 hours, and the health coaching videoconferencing sessions were 30 minutes in length.

After the IM phase, areas for further refinement emerged: program content, implementation strategies, and digital supports. Program content encompassed topics of self-care relating to healthy eating, PA, and stress management and was packaged into workshops, health coaching sessions, activities, and handouts, which were compiled and loaded onto study-provided tablet as an electronic binder (eBinder) (Appendix IV). Implementation strategies consisted of meeting type and program duration. Digital supports housed all tablet applications to supplement content delivery, a PA tracker (Garmin VivoSmart4 Activity Tracker, Garmin Ltd, Olathe, KS, 2018) to support self-monitoring, and a website (www.sporks.colostate.edu) which contained additional resources such as PA videos and recipes. Specific areas for assessment related to components are outlined in Table 4.1.

Table 4.1. HEROs Self-Care Intervention Components and Areas for Assessment

Plan-Do-Study-Act Cycle	Program Component	Areas for Assessment
A	Content	
	Activities	<ul style="list-style-type: none"> • Activities to introduce topics • Timing of activities
	Topics	<ul style="list-style-type: none"> • Order of presented topics
	Electronic Binder (eBinder)	<ul style="list-style-type: none"> • Handout reading level and acceptability of topics • eBinder used for notetaking; delivered on tablet
B	Implementation Strategies	
	Meeting Type	<ul style="list-style-type: none"> • 2 in-person, group workshops • 4 individual health coaching calls over videoconferencing (tablet)
	Duration	<ul style="list-style-type: none"> • 6-week intervention • 1.5 hour in-person workshops • 30-minute individual health coaching calls via videoconference
C	Digital Supports	
	Website	<ul style="list-style-type: none"> • Online videos and handouts
	Mobile Applications	<ul style="list-style-type: none"> • Tablet loaded with applications: PA tracker (Garmin Connect), healthy eating (USDA MyPlate), videoconferencing (Zoom), etc.
	Activity Tracker	<ul style="list-style-type: none"> • PA and step count tracking • Stress tracking

To analyze content, input regarding the acceptability of activities used to introduce topics, the order of topics presented, and acceptability of the eBinder (amount of information, reading level, usability of the eBinder, etc.) was collected. Assessment of implementation strategies explored whether meeting types and videoconferencing technologies would be suitable for participants in rural settings. Feasibility of the usage of digital supports and their integration into daily routines was assessed.

Plan-Do-Study-Act Cycles

Components the HEROs Self-Care program were assessed using six iterative PDSA cycles (Winter 2019-2020) during program development to inform refinement of program content (Cycle A), implementation strategies (Cycle B), and digital supports (Cycle C). PDSA cycles utilized qualitative feedback across three stages and were labeled by stage (1-3) and program component of interest (A-C). For example, in Stage 1 an expert panel provided feedback on content (Cycle 1A). In Stage 2, a group discussion and brief interviews with a convenience sample informed refinement to content and implementation strategies through two PDSA cycles (Cycles 2A and 2B). In Stage 3, the program was piloted with members of the focus population (mothers of preschoolers with limited resources, living in rural communities), and in-depth, post-intervention interviews informed three PDSA cycles on content (Cycle 3A), implementation strategies (Cycle 3B), and digital supports (Cycle 3C).

Participant recruitment, data collection methods, and analysis varied by stage. Qualitative methodology was employed in order to collect, organize, and interpret contextual reactions to piloted intervention components. Researchers were trained according to qualitative research techniques outlined by Goodell et al. (2016). Interviews were utilized to understand program acceptability, suitability, and feasibility¹⁸. Data were compiled from field notes, group discussions, and interviews. A directed approach to content analysis was employed¹⁹. The Institutional Review Board at Colorado State University approved this study, informed consent was gathered from participants and they were compensated for their participation \$40 in Stage 2 and \$100 for Stage 3 (\$300 for full study) (Appendix V).

Data Collection and Analysis

Stage 1 utilized one PDSA cycle (Cycle 1A) with an expert panel (n = 8), convened for their expertise in mindfulness, nutrition, PA, intervention design, and program evaluation. General content, the first workshop, and the eBinder were presented to the panel. Field notes and feedback were compiled and reviewed.

Stage 2 was conducted with a convenience sample of mothers of preschoolers (n = 5) recruited from university and local-area preschool center email listservs to garner input on content (Cycle 2A) and implementation strategies (Cycle 2B) (Appendix VI). Interested mothers were contacted by phone and had to have at least one preschool-aged child. Participants took part in a 60-minute group workshop followed by a 30-minute group discussion to provide feedback. One week later, the same participants completed an individual health coaching session (25 minutes) followed by a brief, 20-minute interview, both via videoconferencing.

The group discussion and individual interview guides for Stage 2 were highly structured (Appendix VII), with seven and 11 questions respectively. Content validity of the guides was established via review by three experts from Stage 1. The group discussion and individual interviews were conducted by a trained researcher, had a note-taker present, and were audio-recorded. Sample questions can be found in Table 4.2. Short reports summarizing key points from the brief interview and group discussions were shared with participants by email as a form of member checking to validate interpretation of the data. Due to the highly structured nature of the discussion and interview guides, responses were reviewed by question to confirm how content and handouts were received and if the implementation strategies were effective. For analysis, group discussion and interview responses, as well as field notes, were reviewed for

consensus by two trained researchers. Findings were confirmed with the note-taker and discussed with a third researcher.

Table 4.2. Select Discussion and Interview Questions by Intervention Component to Inform PDSA Cycles for HEROs Self-Care Refinement

Stage	Question	Targeted Intervention Component	Assessment Methodology
2 & 3	1. Overall, what did you think of the activities in the workshops? a. [Prompts for specific activities]	Content: Activities	Group Discussion, Brief Interviews, In-Depth Interviews
2 & 3	2. What did you think about the handouts? a. What did you think about having the handouts in the eBinder versus in paper? b. How comfortable were you in using the stylus to write on the eBinder?	Content: eBinder	Group Discussion, Brief Interviews, and In-Depth Interviews
2	3. Leading up to this health coaching session, what were some of the thoughts/feelings you had? a. What were your thoughts about using Zoom?	Implementation Strategies: Meeting Type	Brief Interviews
2 & 3	4. What did you think about the time length of workshops and coaching sessions?	Implementation Strategies: Duration	Group Discussion, Brief Interviews, and In-Depth Interviews
3	5. How did you use the iPad over the course of this program? a. [Prompts for website, tablet applications, and activity tracker]	Digital Supports	In-Depth Interviews and Field Notes

Stage 3 consisted of pilot testing the full intervention with members of the focus population (n = 6), field notes, and post-intervention in-depth interviews to inform three PDSA cycles on intervention content (3A), implementation strategies (3B), and digital supports (3C). Mothers were recruited from a rural preschool center in eastern Colorado via interest forms sent home in preschooler backpacks (Appendix VIII).

The interview guide was structured by component to inform each related PDSA cycle and consisted of 17 questions (Appendix IX). In-depth, individual interviews were conducted four months post-intervention via telephone by a trained research team member who had no part in intervention delivery. Member checking was employed. In-depth interviews averaged 35-40 minutes, were audio recorded, and transcribed verbatim (Datagain Services, 2019). A deductive content analysis approach was implemented¹⁹, and a trained researcher sorted responses for each participant (n = 5) by question due to the structured nature of the guide. Two researchers then independently reviewed the compiled nodes to generate cumulative summaries. A constant comparative process was used to assess summaries, and intercoder reliability was determined via verbal consensus among the coders¹⁸. Any discrepancies in coding were negotiated with a third coder as a part of a constant comparative method²⁰.

Results

PDSA cycles were conducted with an expert panel, a convenience sample, and members the focus population. The panel was 88% White and 75% female. The convenience sample (n = 5) was made up of 100% Caucasian, female mothers, with 80% (n = 4) married, and 80% employed full-time. The focus population was made up of mothers with a mean (SD) age of 33.5

years (± 3.5), and a majority was of low-income status (66.7%). A total of 83.3% held a high school diploma or beyond, 100% were White, and 16.7% identified as Hispanic.

Cycle A: Content

In Stage 1, results from the expert panel in a single PDSA cycle (1A) led to several key intervention refinements. A mindful listening activity, a body scan, and mindful breathing activities were added to the intervention. Activities to introduce self-care were also incorporated including an icebreaker to introduce the concept an activity (creating a self-care plan) to summarize new content and provide time for reflection. In terms of the eBinder, handouts were adjusted to improve appropriateness for lower-literacy audiences, averaging a 6.2 Flesch-Kincaid reading level. Further, a “how-to” instructional sheet was created for participants who had never used an iPad tablet, and a more sensitive stylus was purchased for participants to use to take notes with.

In Stage 2, a second PDSA cycle (2A) revealed that participants appreciated the self-reflection activities but also wanted to exchange tips with each other. Additionally, mothers reported not intentionally using mindfulness strategies after the workshop and coaching session, and they requested more guided practices of mindfulness. As a result, peer-to-peer discussion time was incorporated into each workshop and guided mindful breathing exercises were added at the start of each health coaching session. No further changes to handout literacy or the eBinder stylus were needed, but handout titles and page numbers were added to better orient participants.

To assess these changes, a final PDSA cycle was implemented in Stage 3 (3A). Post-intervention interviews revealed that mothers responded positively to mindfulness activities, noting better concentration and presence. One mother said, *“I like how you do [the mindful*

breathing activity] at the beginning so that you can just clear your mind from your daily activity so you're able to concentrate better.” Other mothers, however, expressed some uncertainty with mindfulness practices. One participant said, *“It’s not very often that I’m able to sit for a second and breathe and listen to nothing.”* From this feedback, it was noted that mindfulness was an acceptable topic, but was not comfortable for all. It was also determined that introduction of mindfulness as a topic could be moved to an earlier point in the program (after the first health coaching session) to offer more time for participants to engage with the topic. A summary of select changes from PDSA cycles related to intervention components and corresponding data can be found in Table 4.3.

Table 4.3. Selected Examples of Program Changes Based on PDSA Cycle Data

Program Component & PDSA Cycle	Feedback	Data or Quote	Change
<u>Content</u>			
Cycle 1A - Mindfulness	The expert panel discussion indicated talking about mindfulness as a concept was not the most effective way to introduce the topic.	Field notes from the expert panel suggested the use of activities to introduce mindfulness.	Mindfulness as a topic was introduced through activities. Added: mindful listening, mindful body scan, and mindful breathing exercises.
Cycle 2A - Mindfulness	Mothers had heard about mindfulness and found mindful breathing exercises helpful, but none reported practice outside of the program.	Field notes with the convenience sample showed that no participants reported making use of mindfulness activities outside of the program.	The intervention included opportunities to practice mindfulness at each workshop and at the start of each health coaching session.
Cycle 3A - Mindfulness	Mothers did not recall all of the mindfulness activities or expressed some discomfort. It is a new concept for mothers and not practiced often.	“It was a little bit beyond my comfort level initially. Do we really need to do this?...It is something I should do more often.”	Other mindfulness activities (tied to diet and PA) will be added and the stress management health coaching session will be introduced to allow for more practice.
<u>Implementation Strategies</u>			
Cycle 2B – Meeting Type	There was some apprehension from mothers about meeting one-on-one with a health coach using videoconferencing technology.	Field notes from feedback with the convenience sample revealed that all mothers were able to meet via videoconference; some reported apprehension.	Tablets with the videoconferencing application pre-loaded were provided with detailed instructions on how to connect.
Cycle 3B – Meeting Type	Some delays/ internet connectivity issues, and one mother called via telephone because she did not have internet access on certain days.	“It was harder to have a discussion just because Zoom is harder because of the delays and stuff and people having kids’ noise in the background and all that kind of thing. It was still helpful.”	Videoconferencing was shown to be an acceptable method, with a telephone call as an alternative option. Zoom etiquette was outlined by the facilitator ahead of group meetings.
<u>Digital Supports</u>			
Cycle 3C – Tablet Applications	All mothers were able to use the activity tracker and Zoom application, but few used the other applications loaded onto the tablet.	“During the course of the program, no [I did not use the applications]. I tried not to use the iPad other than for the eBinder and the pictures so I wouldn’t mess anything up.”	Applications that tie to that week’s topic will be introduced during health coaching sessions and promoted to encourage usage.

Note. Expert Panel: Cycle 1A; Convenience Sample: Cycles 2A & 2B; Focus Population: Cycles 3A, 3B, & 3C; PA: physical activity

Cycle B: Implementation Strategies:

In Stage 2, the results of a PDSA cycle (2B) revealed that mothers enjoyed meeting with others at in-person workshops. Input on virtual health coaching showed some initial apprehension with switching between in-person and videoconference meetings. Because of this, changes were made so that the workshop facilitator introduced the videoconference health coaching procedures at the end of the first workshop to allow for questions. In terms of duration, multiple activities were shortened because of limited time during the workshops, which occurred during some families' naptimes, making it difficult to attend. In response to this, half an hour was added to the workshops, and workshops and health coaching sessions were implemented around participant schedules.

A second PDSA cycle (3B) occurred in Stage 3 to further examine implementation strategies, specifically health coaching. The health coaching sessions were generally well received, with one participant from the pilot study stating, *"I thought the timing was good...They were convenient."* This was mirrored with field notes, where the average health coaching session was 28 minutes long, and a total of 23 out of 24 health coaching sessions were completed among all participants. Additionally, all but one participant used video for every session. Because of restrictions relating to COVID-19, videoconferencing was also assessed and verified as a meeting type for the final workshop, with some limitations (background noises and internet bandwidth), but overall mothers appreciated time to reconnect. One mother said: *"[It was good] to be part of a group and have that extra support and just being in a nonjudgmental space."* In terms of duration, other self-care topics could be incorporated with additional health coaching sessions. One mother said, *"For me, I could have done more [health coaching sessions]...maybe*

one or two more...” Thus, two health coaching sessions could be added to the program or other health coaching touch points.

Cycle C: Digital Supports:

One PDSA cycle (3C) was conducted in Stage 3 to assess digital supports. Overall, mothers reported enjoying digital supports of the website, tablet applications, and the activity tracker. Though, when prompted, there was limited usage of both the website and tablet applications. One mother said, *“I didn’t use them [the tablet applications] a ton during the program. I don’t know why exactly...”* In future iterations, the health coach will walk participants through these resources to encourage usage. The activity tracker itself was well received and participants tracked their sleep, step count, and stress levels. One mother said, *“I thought it was helpful to have [the Garmin]. I didn’t realize that maybe I wasn’t getting good restful sleep.”* A summary of the results of the PDSA cycles by component and stage is outlined in Figure 4.2.

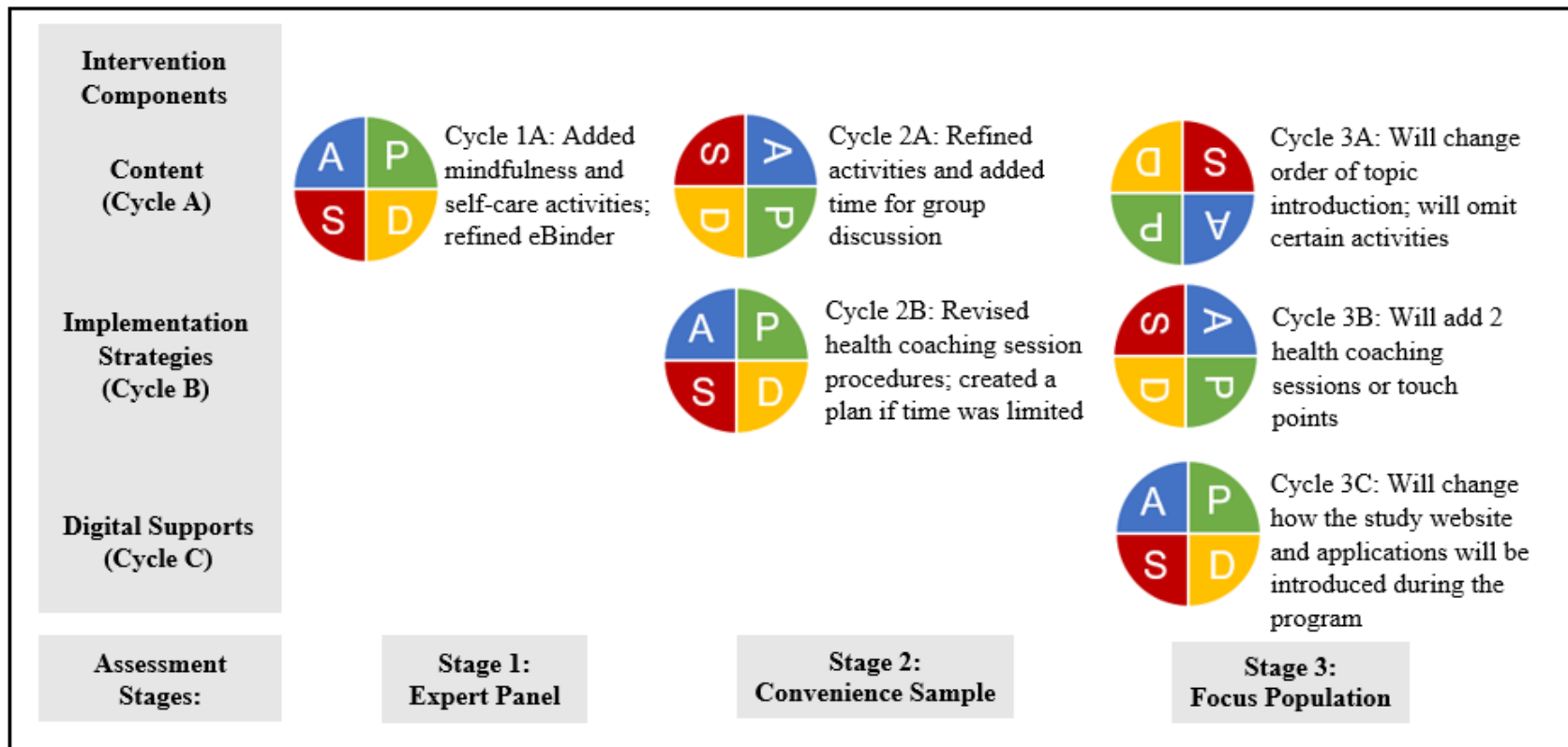


Figure 4.2. Plan-do-Study-Act (PDSA) Cycles for the HEROs Self-Care Intervention
Rotated PDSA cycles represent the iterative cycling process across stages

Discussion

This study employed PDSA cycles to assess and refine program content, implementation strategies, and digital supports for the HEROS Self-Care program. Multiple PDSA cycles were utilized simultaneously to ensure: 1) intervention components were acceptable, suitable, and feasible for mothers of preschool-aged children in rural communities, and 2) each piece of the intervention functioned as intended to address audience-specific contexts and specific programmatic questions.

PDSA cycles were used to move the HEROs Self-Care program toward intervention optimization. One benefit of PDSA cycles is their rapid cycling nature¹⁴, which allowed for HEROs Self-Care program components to be assessed and refined quickly with feedback from multiple stakeholder groups. This can potentially save resources, identify supports and barriers to behavior change²¹, and provide insight into the function of intervention components within specific contexts. Health behaviors are not isolated events, and the social, environmental, and familial system can influence practices²². The present study provides evidence for the utility of conducting multiple PDSA cycles concurrently to develop interventions for populations that face unique barriers to health, such as rural and/or limited-resourced²³.

Within these socioecological considerations, PDSA cycles assessed the acceptability of strategies to meet self-care needs, and mindfulness was one health-promotion strategy that was incorporated throughout the intervention via activities and opportunities for practice. Mindfulness is an especially useful strategy to include in a self-care intervention, as mindfulness has been used to promote stress reduction in parents of young children²⁴, mindful eating in adults with obesity²⁵, and mindful PA among adult exercisers²⁶, which can positively influence health outcomes. Other studies have found mindfulness interventions to be effective for improving

relationships and health behaviors among varying populations including stressed and low-income parents with young children²⁴. Input from mothers in Stage 3, however, revealed that some mothers found mindfulness to be a useful strategy, but others did not utilize mindfulness practices beyond breathing (such as mindful body scans or mindful listening). Future PDSA cycles could investigate the role of systems-level factors that impact mindfulness practice²⁷ and explore new strategies for promoting mindful practice in interventions like mindful journaling.

Beyond content, PDSA cycles integrated digital technology strategies to fit specific contexts and engage rural audiences in the HEROs Self-Care intervention. Recent evidence has been gathered to support the efficacy of health interventions delivered via digital technologies and may prove to be convenient strategies for a multitude of purposes and audiences²⁸. For example, videoconferencing technology was a suitable implementation strategy for both individual and group meetings and provides opportunities to overcome potential distance or location barriers²⁹. The study-provided website, a minor piece of the intervention, had minimal usage, though websites and other digital strategies have been used to recruit participants and deliver health interventions²⁹. Future intervention strategies could better integrate the website into program activities. A study-provided activity tracker, which assisted participants with goal setting and self-monitoring, was well accepted, and PA trackers provide a promising tool for increasing PA and behavior change techniques within interventions²⁹. Future PDSA cycles could assess different functionalities (e.g., badges, challenges, and games) of trackers in behavior change. In this way, PDSA cycles were used in the optimization process to integrate strategies that were acceptable to audience members and created greater potential for behavior change.

There were strengths and limitations to this research. First, while mothers' feedback has potential to enrich understandings of how a mindful self-care intervention would be received in

this population, social desirability is a potential source of bias. Additionally, there may be response bias reflected in the mothers that chose to participate in a self-care study. Finally, in typical PDSA cycles, change components are tested in multiple iterations, but digital supports were tested in one cycle with one group. Additional PDSA cycles could further improve intervention strategies to meet the audience context in the optimization process. The strengths of this study included the integration of feedback across intervention development stages as well as the use of multiple methods for component assessment. An additional strength lies in the interactive nature of PDSAs with each cycle informing the next. This allowed for the assessment and refinement of individual components within the context of the larger intervention as well as with members of the focus population.

Conclusions and Implications for Practice

Intervention optimization prior to full-scale implementation potentially saves resources and can result in more context-specific interventions that consider the systems in which audiences practice health behaviors. PDSA cycles are an optimization strategy used to tailor intervention components to the focus population's context and reflect a valuable method for engaging traditionally underserved populations such as those living in rural communities. In this study, PDSA cycles were used to move the HEROs Self-Care program toward optimization by assessing and refining program content, implementation strategies, and digital supports. Further optimization, such as use of a Multiphase Optimization Strategy (MOST) framework¹¹, is a viable next step as it can identify individual and/or combinations of intervention components to enhance target behaviors which, in turn, may facilitate improvements in diet, PA and stress management to improve health outcomes in mothers of young children. Using optimization

strategies ensures intervention components to be efficient, affordable, and scalable. These approaches can then avoid audience-specific barriers and ensure intervention components function as intended, enhancing intervention effectiveness.

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CHAPTER 5: THE REFINED HEROS SELF-CARE INTERVENTION

Overview

The purpose of the HEROs Self Care program was to promote maternal mindful self-care behaviors to improve diet quality, physical activity (PA), and stress management practices. The program was developed with target audience input and Intervention Mapping (IM) strategies. IM steps and Social Cognitive Theory (SCT) constructs (e.g., behavioral capability, self-efficacy, and outcome expectancies) collectively with mindfulness, goal setting, and self-monitoring served as the foundation of the intervention and guided the development of intervention content and materials. Program components including content, implementation strategies, and digital supports were assessed using Plan-Do-Study-Act (PDSA) Cycles. The intentional design, planning, and integration of stakeholder input led to a purposeful program structure and key design features. The objective of this chapter is to describe the intentional design and final intervention components of the HEROs Self-Care program and outline the rationale for inclusion of specific behavior change strategies.

Program Structure

The HEROs (**H**ealthy **E**nvi**R**onments) Self-Care program was designed to be delivered over 8 weeks, beginning with a pre-intervention health fair, followed by 6 weeks of intervention (2 group workshops and 4 individual health coaching sessions), and a second health fair to conclude the program. The program used Intervention Mapping in which performance objectives were outlined to target maternal diet, PA, and stress management behaviors. Subsequent behavioral determinants of change to meet these performance objectives were outlined as

operationalized SCT constructs (Table 5.1). Building from performance objectives and behavioral determinants of change outlined, specific program strategies were developed. These strategies focused on goal setting, self-monitoring, reflection, and mindfulness. Strategies were identified in the literature as effective behavior change techniques..

Table 5.1. Performance Objectives for the HEROs Self-Care Intervention and Behavioral Determinants of Change

Maternal Performance Objectives	Determinants				
	Behavioral Capability	Self-efficacy	Outcome Expectancies	Mindfulness	Goal Setting and Self-Monitoring
Manage perceived stress/HE/PA by incorporating mindfulness and self-care activities into daily schedules.	Has the knowledge and skills to manage perceived stress/HE/PA using self-care techniques.	Feels confident about using self-care techniques to manage perceived stress/HE/PA.	Believes managing stress/HE/PA is worthwhile and important for self-care.	Is able to recognize the feeling of stress/HE/PA in the moment and choose a mindful response.	Is able to set stress management/HE/PA-related goals and monitor weekly stress levels/diet/PA.

Programmatic Components

Program components included workshops, health coaching sessions, an eBinder, and digital supports. Program content, implementation strategies, and digital supports components were developed to incorporate these strategies and target programmatic performance objectives. These, along with chosen strategies to behavior change and specific rationale for their inclusion within a behavior change context, are described below.

Health Fair:

Two health fairs were created to bookend the intervention. The initial health fair was designed to provide participants with personalized health information to guide health coaching discussions and as a basis for goal setting during coaching sessions. The health fair was also used as an opportunity to distribute materials such as the study-issued tablet and eBinder and to collect baseline data. The post-intervention health fair would provide an opportunity for study closure with participants as well as an opportunity to collect post-intervention data.

Health information was to be gathered during an in-person meeting at a centralized location, one-week prior to the initial workshop. Participants would complete assessments and wear an accelerometer to provide information on diet quality, PA levels, and sleep amounts. Key health indicators including anthropometrics (height, weight, and waist circumference), blood lipid panels, Hemoglobin A1c (HbA1c), and blood pressure would be collected. Participants then would receive their health information in the form of a Health Fair Report Card (Appendix X) one week later at the initial workshop. This Report Card included detailed information about recommended ranges for health indicators, the participant's own results, and whether those results met recommendations, were borderline at-risk, or put the participant at-risk for

cardiovascular disease. This feedback would then be reviewed with participants at the first health coaching session. Because accelerometers were to be re-collected at the initial workshop (after one week of wear), this data would be analyzed and provided to the participants verbally at the first health coaching session, with their permission. The Health Fair Report Card was designed to be used as a tool by the health coach throughout sessions to guide conversations around health literacy and health goal setting with personalized data. Other studies have found personalized approaches to health coaching to be both effective and acceptable to audience members¹, and personalized data would provide a starting context in the HEROs Self-Care program within which to set goals with the health coach and participant.

Workshops

Group workshops were designed to be an hour and a half in duration and incorporated strategies and aspects of adult learning principles, social support, and an introduction to mindful self-care. The initial and concluding workshops consisted of similar structure and elements. First, the initial workshop was designed to begin with an introduction to the program (including a roadmap and timeline for the intervention), an overview of self-care as a topic, a guided introduction and activity on mindfulness, a group discussion, and distribution of materials (e.g., PA tracker). Participants would also be given instructions on how to access and take notes on the study-provided tablet. The concluding workshop was designed to include a guided mindfulness practice, reflection on health coaching and goal setting each week, group discussion, and the completion of a self-care plan.

Two group workshop facilitator guides were created with SCT constructs and adult learning principles² to engage adult learners with content (Appendix XI). Adult learning

encompassed specific strategies to motivate and inspire adult learners². The “4 A’s” of adult learning³ were utilized to create an “Anchor” or grounding connection with each individual’s experience. This was a reflection question about participant self-care or weekly health goals set. The “Add” included new information about mindful self-care as diet, PA, or stress management behaviors, and the “Application” provided guided opportunities for reflection on how the new information could relate to the participant’s life (e.g., an activity to create a self-care plan or opportunity to practice mindfulness). Finally, an “Away” allowed for a final activity or take-away to promote practice with the new concepts usually in the form of setting health goals for the following week and completing a weekly reflection worksheet.

Mindfulness as a topic was woven throughout the program workshops in activities, self-reflection opportunities, handouts, and guided discussions. Mindfulness has been labeled as a possible determinant of health⁴ as well as has been used to enhance psychological well-being⁵ and encourage healthful behavior change⁶⁻⁹. Mindful breathing exercises¹⁰, mindful awareness practices¹¹, and incorporating mindfulness into eating¹² or PA¹³ are strategies that have been used by other studies that were incorporated into the HEROs Self-Care program. Mindfulness was introduced in the initial workshop through a mindful listening activity. This activity brought awareness to one’s surroundings with emphasis on noticing things nonjudgmentally to introduce the concept in a concrete way. Thus, in the program, mindfulness was introduced first as its own topic and then as a component of self-care.

The program was designed to present mindful self-care in program workshops with content that focused on identifying personalized types of self-care, potential barriers to practice, and the prioritization of self-care amidst barriers. This was integrated throughout handouts, discussion, and activities. Handouts and activities guided self-reflection about how each

participant viewed themselves (e.g., The Self-Collage activity) as well as identification of personal needs for and importance of self-care (e.g., Hierarchy of Needs and the Self-care Plan activities).

The workshops also allowed time for group discussion about strategies to overcome challenges to self-care in order to foster the building of social support within the group. Activities (e.g., Redball) incorporated innovative approaches like improvisation techniques to introduce concepts like mindfulness and mindful awareness. These were delivered as icebreakers, but served as an introduction to content, as well. Social support has been highlighted as an important strategy for stress management¹⁴ and overarching behavior change^{15,16}. Additionally, social support was confirmed as a strategy during refinement with PDSA cycles as participants requested more time to exchange tips for self-care. Thus, time for participants to engage with each other was incorporated throughout both group workshops to build time and opportunity for social support development.

Health Coaching Sessions

In addition to workshops, 4 individualized health coaching sessions were designed to provide participants with an opportunity to set personalized and guided goals for health as well as to discuss opportunities and barriers for self-care practice within a supportive environment. These were expected to last 25-30 minutes.

Coaching sessions were developed to incorporate Motivational Interviewing techniques¹⁷ and participant data from the pre-intervention health fair to guide discussion. Four general themes within the construct of mindful self-care guided each session: goal setting for health, healthy eating, PA, and stress management. Four scripts were created to guide these conversations (Appendix XII). The first week of coaching integrated a reflection on the initial

workshop designed to provide a review of self-care prioritization and mindfulness topics as well as introduced new content on goal setting for health.

Each subsequent coaching session began with a mindfulness activity led by the health coach which would then be followed by a check-in about self-care goals, the introduction of new content, and the guided setting of a new goal. New content on each week's topic would then be discussed with a corresponding handout and guided reflection worksheet. The second week of coaching was designed to provide information on healthy eating as self-care, guided identification of barriers to healthy eating and potential solutions, and mindful eating practices. The third week of health coaching encapsulated PA, barriers to PA, incorporating PA into the time available in a day, and mindfulness in PA. The final coaching session focused on mindfulness as a stress management strategy and identification of types of daily stressors. Participants were encouraged by the health coach weekly to use the digital supports (e.g., activity tracker, website, or tablet application) to help facilitate self-monitoring for health goals set each week¹⁸.

Goal setting is a health behavior change strategy that was incorporated across each week of health coaching. It has been identified by previous literature as critical for behavior change, specifically in interventions focusing on diet and PA modification for health improvement.¹⁹ According to literature in the field of task-performance, a goal is the aim or target of a specific action.²⁰ Four steps have been identified in goal-setting theory as necessary for goal accomplishment.²¹ The first step is the recognition of a need for some sort of specific change. Within the scope of this project, it included discussion with a health coach about the desire for a change related to healthy eating, PA, or stress management behaviors. The second step is establishing a specific aim or objective to meet that change need. The HEROs Self-Care program

was designed to provide a health coach to guide the creation of a specific objective, identified by participants. Monitoring for progress toward goal achievement is the third step, followed by a final step of rewarding oneself for goal attainment.²¹ In the program, a health coach worked to provide participants with the tools (e.g., activity tracker for self-monitoring) and skills (e.g., guided self-reflections, the SMART goal framework, and solutions or ideas for the prioritization of self-care) to assess progress toward goal achievement while celebrating steps taken toward this achievement.

Goal setting for health was designed to be introduced at the first health coaching session using to specific frameworks. First, the SMART (Specific, Measurable, Attainable, Realistic, and Timely) goal framework²² was introduced at the an initial health coaching session on setting SMART goals for health. This framework was then utilized each week to set a goal for the following week. Additionally, the GROW (Goal, Reality, Options, and Way Forward) model was integrated across coaching sessions to structure discussion about supports and barriers to health goals, and to brainstorm options to move forward with a health goal²³. By recognizing that challenges would arise when setting goals, coaches and participants were able to approach real barriers non-judgmentally and discuss potential options or strategies for meeting a goal within the context of each participant's lived experience²³.

While scripts guided the overarching conversation for each health coaching session, the coaching philosophy and approach were intentionally cultivated to encompass participant empowerment²⁴, goal setting for motivation²¹, and to recognize participants as the experts of their own experience^{17,25}. Motivational Interviewing served as a framework for integration of this philosophical base within the coaching scripts as well as within conversation that emerged during sessions²⁵. Certain techniques such as reflecting participant statements back to them, or

mirroring, and questioning to explore a participant's own reasons for change were utilized within an atmosphere of non-judgment and compassion²⁵. This self-awareness of the participant's reasons for change was further nurtured with mindful awareness activities as well as self-monitoring practice using digital supports.

Electronic Binder (eBinder):

Handouts were compiled and loaded onto an electronic binder (eBinder) on the study-provided tablet (iPad Mini, 6th generation, Apple Inc., Cupertino, CA, 2018) in place of a paper binder (Appendix IV). The purpose of the eBinder was to provide written content on programmatic topics, to set aside space for reflection and notetaking, and to guide certain activities. Handouts were written on average at a 6.2 reading level (Flesch-Kincaide, Microsoft Word) to be appropriate for lower-literacy audiences, as well, and included content, tips, and questions for personal reflection. The eBinder was saved on each tablet for ease of access and to allow for notetaking directly on to the electronic version. Twenty-five handouts were developed including a program overview, content for each week, guided worksheets for specific discussions (e.g., the Self-collage and Hierarchy of Needs Ladder activities), and supplemental worksheets for mindful eating, stress level tracking, a grocery list, and a weekly meal plan. Supplemental worksheets were introduced in the corresponding health coaching week as an additional way to practice (or "Apply") new content. Reflection worksheets were also developed to scaffold participants' practice of mindfulness and to be used by the participant each week to reflect on the self-care goal set and topic from that week's coaching session. These worksheets emphasized Watch, Listen, Talk, Try, and Reflect (WaLTTR) mindfulness practices. WaLTTR worksheets

were also used after health coaching sessions and workshops to assist with weekly goal setting and to facilitate the incorporation of mindfulness into diet, PA, and stress management goals.

Digital Supports:

Digital supports included applications loaded on the tablet to enhance self-efficacy and to supplement content delivery, a PA tracker (Garmin VivoSmart4 Activity Tracker, Garmin Ltd, Olathe, KS, 2018) to support self-monitoring throughout goal setting, and a complementary intervention website (www.sporks.colostate.edu) which contained information relating to the program and additional resources such as PA videos and recipes. These pieces were designed to enhance intervention content, to facilitate participant self-monitoring and improved self-efficacy¹⁸, and to provide engaging strategies to sustain behavior change²⁶.

Mobile applications are popular strategies for monitoring PA levels²⁷, tracking diet behaviors²⁸, and even connecting with others that share similar goals or health coaches²⁹. Health-related mobile applications often contain goal-setting and self-monitoring strategies for users^{27,30}, like strategies outlined by the HEROs Self-Care program to meet behavioral determinants of change. Mobile applications could be loaded on to the study-issued tablet to provide resources on healthy eating, PA, and stress management as well as to introduce interactive strategies for content delivery. Additionally, applications would allow participants to “Apply” and practice learned concepts. Identified applications to provide this support to participants included mindfulness applications (e.g., Relax Melodies and Quility) to provide participants with opportunities for mindful breathing and reflection exercises. The Garmin Connect™ application and the United States Department of Agriculture’s State Simple with MyPlate application were to be loaded onto the tablet, as well, to further guide participant goal setting and self-monitoring.

Activity trackers have become a popular means to monitor, track, and provide real-time information on a variety of health data³¹. Garmin activity trackers (Garmin VivoSmart4 Activity Tracker, Garmin Ltd, Olathe, KS, 2018) were planned to be given to participants at the initial workshop. The purpose of these PA trackers was to encourage self-monitoring via the tracking of health data including activity levels, sleep, and stress levels³¹. Together, with guidance from the health coach, the participants could monitor their personalized data as they set related goals. Each week, the health coach could log on to the Garmin Connect™ application and view participant step counts, PA levels, sleep amounts, and stress levels. This intervention strategy was chosen for its effectiveness in improving self-monitoring and self-efficacy among study participants¹⁸, but could also provide helpful information for the health coach as they prepared for each week's health coaching session.

A website was also designed to promote self-care practice and was planned to be introduced at specific times throughout the intervention (at workshops and health coaching sessions) to drive participants to use it. Websites are a low-cost source of health information³², and the HEROs Self-Care program website was designed to be accessible and interactive³³. It consisted of handouts on self-care topics (healthy eating, PA, and stress management) as well as links to videos and audio recordings for guided PA (e.g., yoga, stretching, at-home workouts) and mindfulness (e.g., mindful breathing exercises, body scans, and awareness activities) practice. It also linked to recipe videos with healthy meal and snack ideas. The website complemented both workshop and health coaching content as well as provided resources and ideas for different strategies to set and reach health goals. For example, if a participant set a PA-related goal to reach certain amount of PA time each day, there were options on the website to provide guided practice to reach the goal. Table 5.2 outlines key program components.

Table 5.2. Program Elements, Activities, and Handouts for the HEROs Self-care Program

Week (Session)	Program Element	Description / Topics	Activities	Corresponding Handouts
1	Initial Workshop	<ul style="list-style-type: none"> • Introduction to self-care and program objectives • Introduce mindfulness • Prioritizing self-care in daily activities 	<ul style="list-style-type: none"> • Red Ball • Self-Collage • Hierarchy of Needs Ladder • Mindful Listening 	<ul style="list-style-type: none"> • Roadmap • Guiding Principles • Know Yourself • Self-Collage • Hierarchy of Needs Ladder • Basics of Self-Care • Mindfulness
2	Health Coaching: Goal Setting	<ul style="list-style-type: none"> • Goal setting and self-monitoring for health • Introduction of SMART Goals • Health Fair Results 	<ul style="list-style-type: none"> • Mindful Breathing • Initial workshop reflection • Setting a Weekly SMART Goal 	<ul style="list-style-type: none"> • SMART Goals • WaLTTR SMART Goals
3	Health Coaching: Healthy Eating	<ul style="list-style-type: none"> • Healthy eating as self-care • Monitoring self-care goals 	<ul style="list-style-type: none"> • Mindful Breathing • Reflection on SMART Goal • Setting a Weekly Self-Care Goal 	<ul style="list-style-type: none"> • Healthy Eating • Mindful Eating • Mindful Eating Journal • Grocery Shopping List • WaLTTR Healthy Eating
4	Health Coaching: Physical Activity	<ul style="list-style-type: none"> • Physical activity as self-care • Setting daily self-care goals 	<ul style="list-style-type: none"> • Mindful Breathing • Reflection on SMART Goal • Setting a Weekly Self-Care Goal 	<ul style="list-style-type: none"> • Physical Activity • Tips to Be Physically Active on Busy Days • WaLTTR Physical Activity
5	Health Coaching: Stress Management	<ul style="list-style-type: none"> • Stress management as self-care • Self-care goals that become habits 	<ul style="list-style-type: none"> • Mindful Breathing • Reflection on SMART Goal • Setting a Weekly Self-Care Goal 	<ul style="list-style-type: none"> • Stress and Stress Management • Mindfulness Practices • WaLTTR Self-Care
6	Final Workshop	<ul style="list-style-type: none"> • Building a self-care plan • Emergency and Maintenance Self-Care 	<ul style="list-style-type: none"> • Mindful Body Scan • Program Reflection • Self-Care Bracelets 	<ul style="list-style-type: none"> • Creating a Self-Care Plan • The Self-Care Plan

Specific, Measurable, Attainable, Realistic, Timely (SMART); Watch, Listen, Talk, Try, Reflect (WaLTTR)

Considerations

Two major considerations guided the selection and integration of the abovementioned programmatic strategies as well as the final structure of the HEROs Self-Care program. These were the selection of effective behavior change strategies identified from the literature and the structuring of the HEROs Self-Care program to potentially complement another program. First, integration of strategies identified in the literature allowed for a targeted approach to outlined performance objectives and behavioral determinants of change. Behavior plays a critical role in maintaining health and wellness, and specific strategies to promote certain health behaviors may be more effective in bringing about behavior change³⁴. Specific strategies can maximize efforts of targeted behavior change. Therefore, strategies and approaches such as Adult Learning², Motivational Interviewing¹⁷, and SMART goal setting²², which have been used by other behavioral interventions, were identified in the literature as promising strategies to regulate behavior change.

Second, the HEROs Self-Care intervention was designed to possibly complement the HEROs 8-week Parent program, whose focus is to promote healthy home environments and lifestyles for mothers of young children from low-income, rural communities³⁵. The HEROs Self-Care intervention components were designed intentionally to fit within this greater program, which housed weekly, in-person meetings with participants. Special considerations were taken to minimize participant burden such as shorter health coaching sessions conducted virtually each week instead of longer in-person meetings and an eBinder for ease of use. Thus, the HEROs Parent program and HEROs Self-Care program could be brought together and conducted simultaneously with minimal participant burden.

Conclusion

The HEROs Self-Care program was intentionally designed with Intervention Mapping as a framework and select performance objectives relating to healthy eating, PA, and stress management. Key programmatic components included workshops, health coaching sessions, an eBinder, and digital supports. Research-based intervention strategies for targeting behavior change were identified and then incorporated into each component to maximize behavior change efforts. Workshops utilized Adult Learning principles, mindfulness activities, and group discussions to improve knowledge about self-care practices, to facilitate incorporation of reflection and mindfulness into daily life, and to foster social support. Coaching sessions utilized goal setting and Motivational Interviewing strategies to empower and motivate participants toward personalized health objectives. The eBinder was designed to integrate information at an appropriate level and provided structured worksheets for reflection and incorporation of mindfulness into other topic areas. Digital supports allowed participants to track and monitor their progress toward goals. These considerations and strategies led to a version of the HEROs Self-Care program that was ready to be piloted with members of the target audience.

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CHAPTER 6: PILOT TESTING THE HEROS SELF-CARE PROGRAM TO INFORM INTERVENTION NEED, FEASIBILITY, AND ACCEPTABILITY

Summary

Background: Mindful self-care shows promise as an obesity prevention strategy for interventions targeting diet, physical activity, and stress management, but few interventions include it. More information is needed about the feasibility and acceptability of self-care in obesity prevention as well as what need exists for maternal self-care interventions. **Objective:** To summarize baseline health characteristics and target behaviors as well as to explore the feasibility and acceptability of the HEROs Self-Care program through pilot testing with mothers of preschool-aged children with limited resources and living in rural communities. **Design:** Baseline health data were collected in the form of biological, anthropometric, and survey measures at a pre-intervention health fair with mother-child dyads ($n = 23$), recruited from preschool centers ($n = 3$) in rural Colorado. The HEROs Self-Care program was piloted with a subsample of mothers ($n = 6$), and process data (fidelity, dose, and reach) were gathered throughout the intervention to inform program feasibility. At a follow-up period 4 months post-intervention, qualitative interviews ($n = 5$) were conducted to inform program acceptability (participant opinions and perceived effectiveness of the program) and program refinements. **Analysis:** Means, standard deviations, and frequencies were computed for baseline data, and Z-tests of the medians and chi-square tests were conducted to examine differences in biological and survey data by group. For feasibility, a notetaker scored script adherence (0-3) and noted any issues that emerged during implementation. Additionally, the dose delivered was assessed for workshops and coaching sessions, and session attendance and goal setting data were compiled. For acceptability, interviews occurring at post-intervention were transcribed and analyzed using

a directed and deductive approach. Responses were sorted for each participant by question due to the structured nature of the interview guide, and two researchers independently reviewed the compiled nodes to generate cumulative summaries by SCT construct and intervention component. **Results:** Baseline data highlighted a high prevalence of cardiovascular disease risk factors (dyslipidemia, hyperglycemia, hypertension, and elevated waist circumference) among the sample, with 69.6% of participants presenting with 3 or more risk factors (indicating metabolic syndrome). Additionally, 59.1% of mothers had a BMI greater than or equal to 30.0, placing them in the obese range. Script fidelity averaged 2.4/3.0 for the first workshop and 2.8/3.0 for the concluding workshop. In terms of dose delivered, 6/6 participants attended both workshops, and 23/24 health coaching sessions were completed, averaging about 28 minutes long. A total of 29 health goals were set and attained in part or whole over the course of 4 weekly health coaching sessions. Interviews at post-intervention revealed program topics and implementation to be acceptable to the target audience, and suggested potential refinements included additional health coaching sessions, the inclusion of additional content, and revision to data collection methodologies. **Conclusion:** Findings provided further context of the need for a maternal self-care intervention, and pilot testing the intervention revealed the program to be feasible to implement and acceptable to members of the target audience.

Introduction

Obesity is a chronic disease with increasing rates among children and adults in the United States^{1,2}. Women of childbearing age are particularly vulnerable for overweight or obesity and related diseases³, with 54% of overweight or obese women being of childbearing age⁴. This presents a major public health concern as obesity is associated with chronic disease risk, such as

cardiovascular disease (CVD)⁵⁻⁷ and Type II Diabetes Mellitus (T2DM)⁸. CVD has widespread prevalence in the United States and is the leading cause of death among men, women, and across ethnic and racial populations⁹. T2DM is strongly related to weight status, and, together with obesity, increases an individual's mortality risk¹⁰. Obesity-generating behaviors related to poor diet and physical inactivity, therefore, are important targets for obesity and disease prevention.

Poor diet and physical inactivity are strongly related to weight status and related chronic diseases, and lifestyle modifications in the form of diet and physical activity (PA) are effective targets for obesity prevention^{11, 12}. Many American adults, however, are not meeting national dietary and PA recommendations^{13, 14}. The Dietary Guidelines for Americans recommend diets high in fruits, vegetables, lean proteins, and whole grains, yet many American diets fall short in these categories and are higher in processed foods¹⁴. Physical Activity Guidelines recommend 30 minutes a day of moderate to vigorous activity¹⁵. Du et al. found that less than 66% of Americans meet PA recommendations, and that time spent sedentary had significantly increased over recent years¹⁶.

Diet and PA are largely shaped by the environments in which individuals live, learn, and work in¹⁷, and ecological approaches to understanding obesity may help the understanding of factors leading to obesity¹⁸. The household or family environment is especially important in understanding obesity-related diet and PA behaviors. In the family environment, parents, and mothers in particular, play a significant role in their children's food-intake^{19, 20} and PA levels^{21, 22}. Beyond presence or absence of health promoting factors in the household, mothers also play a role in creating and fostering habits, and often set the family diet^{19, 20, 23-25} and PA²⁶ norms and behaviors^{27, 28}. These play an important role in a child's weight status and may be influenced by the mother's own behaviors and practices, making mothers an important target.

Mothers of young children may face challenges to healthy diet and PA practices. With regard to PA, research indicates that time constraints, guilt, family obligations, and physical limitations or being out of shape may act as potential barriers to PA practice^{29, 30}. In terms of feeding the family, employment schedules, management of preschooler behavior, and for those living in rural areas, social isolation, were among barriers reported to impact family routines³¹. Maternal psychological stress is another factor that may impact maternal weight-influencing health behaviors and subsequent weight status^{32, 33}, and has even been linked with child psychosocial stress and obesity^{34, 35}. This stress in mothers may stem from a number of factors, especially in the preschool years, including contextual factors of the home, child-specific traits, child bids for autonomy, emerging preferences, and emotional reactivity often exhibited by young children^{36, 37}. Thus, barriers to maternal diet, PA, and stress management may be important considerations with interventions considering family approaches to obesity prevention.

Self-care is one strategy aimed to promote stress management and health. Self-care, or any health-promoting activities to maintain personal well-being^{38, 39}, has gained popularity in modern culture. A form of self-care is the practice of mindfulness, which has been used as a strategy to improve physical and mental well-being^{38, 39} and is described as awareness of internal needs and external demands as well as intentional practice of health promoting activities to meet one's needs and promote one's wellbeing with kindness⁴⁰. Self-care has been used as an intervention strategy among high-stress professions^{41, 42}, but few obesity interventions consider self-care, especially in the family context. The literature reveals self-care to be a promising method for health promotion^{41, 43}, and evidence points to maternal self-care being an important consideration in obesity prevention efforts within the family context.

Grounded in the literature, the HEROs Self-Care intervention was designed to improve maternal self-care behaviors of healthy eating, PA, and stress management as a potential target for childhood obesity interventions. The objective of this chapter was to summarize baseline health characteristics and target behaviors as well as explore the feasibility and acceptability of the HEROs Self-Care program through pilot testing with mothers of preschool-aged children with limited resources and living in rural communities. This chapter outlines the pilot study with 1) Program Implementation and Evaluation Measures and 2) Baseline, Feasibility, and Acceptability Results. The study was conducted with participants recruited at preschool centers from September 2019 – August 2020.

Section I: Program Implementation and Evaluation Measures

The HEROs Self-Care program was developed to promote maternal mindful self-care behaviors. It was conducted over 8-weeks, starting with a pre-intervention health fair followed by 6-weeks of intervention. Intervention content was delivered by workshops, coaching sessions, and digital supports.

Conceptual Model

A conceptual model was developed to outline the relationship between intervention pieces, maternal diet, PA, and stress management behaviors, and maternal and child outcomes (Figure 6.1). Theoretical constructs and behaviors were outlined as proximal and distal mediators for outcomes which include maternal diet quality, PA levels, maternal health status as well as child weight status.

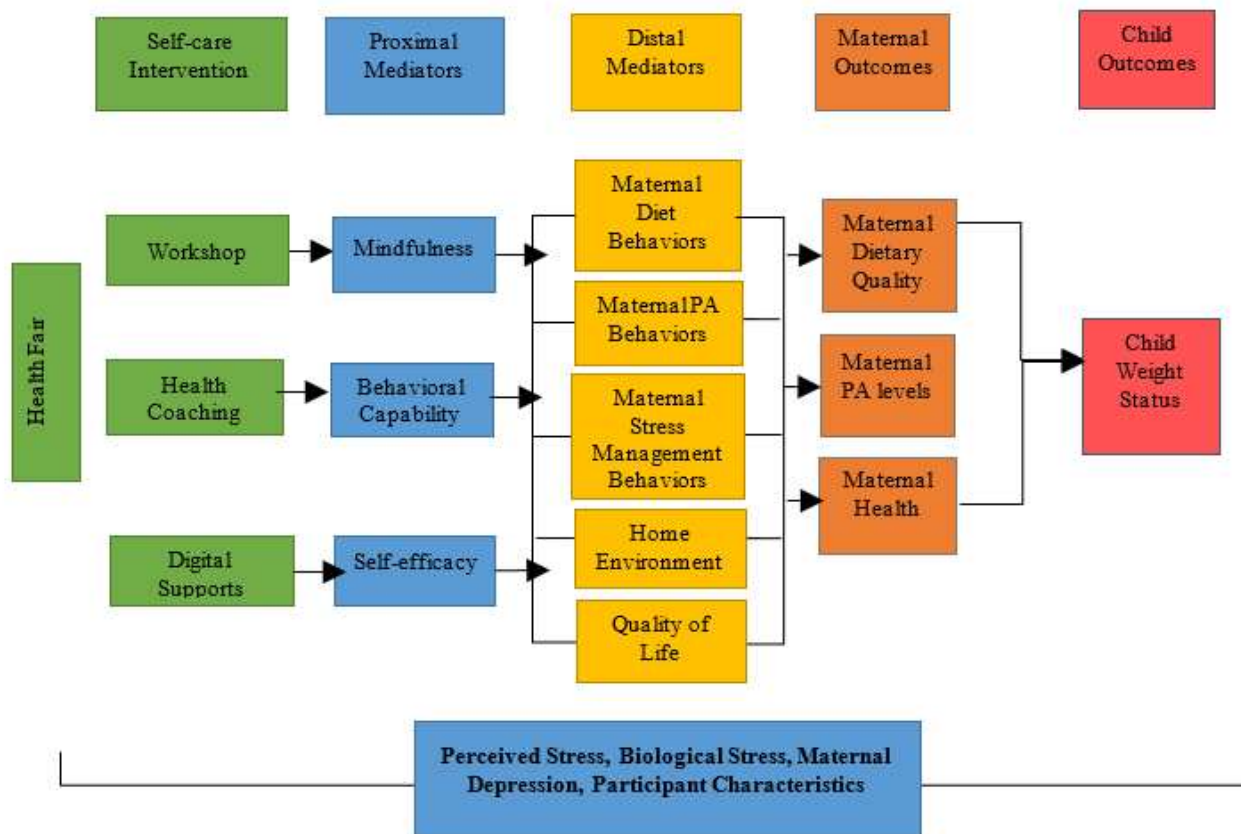


Figure 6.1. HEROs Self-Care Conceptual Model Outlining the Relationship between Intervention, Mediators, and Maternal and Child Outcomes

Figure 6.1. outlines a proposed relationship, based in the literature, between self-care intervention pieces and potential factors impacting maternal and child outcomes. SCT acts as the foundation for intervention components and constructs are reflected as proximal mediators of self-efficacy and behavioral capability. Mindfulness, though not a SCT construct, may have a similar impact on distal mediators as a SCT construct. Distal mediators encompass behaviors, the built home environment, and perceptions of quality of life. Self-regulation and motivation for PA practices, emotional, restrained, or disinhibited eating, may predict PA levels and diet quality respectively^{44, 45}. These behaviors, the built home environment, and a mother's perceived quality of life may play a role in outcomes such as diet quality, PA levels, and maternal health. Health here incorporates maternal weight status as well as risk for cardiovascular disease (CVD). The literature provides evidence for a link between maternal behaviors and weight status and child weight status²⁰. Thus, maternal and child outcomes are represented in this conceptual model as related. Of note, child diet and activity behaviors are often learned within the home environment and may be influenced by maternal behaviors⁴⁶. Child diet and activity behaviors relate to child weight status, as well, but are not reflected in this model. More information is needed to test these proposed relationships.

Recruitment

Participants were recruited from preschool centers in the Eastern Colorado Plains, including the intervention site of Wray, and two control sites from the larger HEROs intervention: Iliff, and Greeley. Each preschool informed families of the study with a recruitment flier and interest form via their child's backpack, with instructions to return the interest form to their child's teacher if they were interested in participating. Eligible mother-child dyads

consisted of 1 child (preschool-aged) and 1 mother. Staff then contacted participants to screen for inclusion criteria: mothers and/or female guardians acting as a primary caregiver to their preschool child, mothers of children enrolled in a Head Start or preschool center, mothers of children without genetic or developmental conditions impacting diet or activity behaviors, and mothers able to complete self-report measures independently in English.

The final sample ($n = 23$) included mother-child dyads in two groups. The treatment, “self-care”, group ($n = 6$) received the HEROs Self-care program, while the control group ($n = 17$) was a part of the larger HEROs intervention and did not receive HEROs Self-Care. The self-care group was the same group that provided insight into Plan, Do, Study, Act (PDSA) cycles on content, implementation strategies, and digital supports (Chapter 4). The institutional review board at Colorado State University approved this study (Appendix I). Written consent was gathered prior to the initiation of the study. Participants were compensated \$100 for each baseline, post-intervention and follow-up data collection measures.

Project Timeline

The timeline followed for program design, recruitment, and implementation strategies is outlined in Table 6.1.

Table 6.1. HEROs Self-Care Timeline: April, 2019 – July, 2020

HEROs Self-Care	Spring 2019	Summer 2019	Fall 2019	Winter 2020	Spring 2020	Summer 2020
Intervention Development						
Self-Care Interviews	X	X				
Intervention Mapping		X	X			
Expert Panel Review			X			
Convenience Sample Review				X		
Intervention Recruitment						
Control Group Recruitment			X			
Self-Care Intervention Group Recruitment				X		
Baseline Data						
Control Group Pre-intervention Health Fair				X		
Intervention Group Pre-intervention Health Fair				X		
HEROs Self-Care Program Implementation						
Initial Workshop				X		
Health Coaching Sessions				X	X	
Concluding Workshop					X	
Post-Intervention Data Collection					X	
Follow-Up Data Collection						X

Data Collection

Baseline data (information on maternal health and health-related behaviors) and data to inform feasibility and acceptability were gathered. Baseline data was collected at a pre-intervention health fair, and post-intervention data collection occurred a week after the concluding workshop. Data was collected throughout the intervention to inform feasibility, and acceptability was assessed qualitatively at the 4-month follow-up period post-intervention.

Importantly to note, the program was initially designed to be piloted with participants (n = 30) across rural groups in Northern Colorado. The COVID-19 pandemic, however, became a major impediment to completing a full pilot test. As it was, the HEROs Self-Care program was piloted with a small group of participants (n = 6) and baseline data for the control group had already been collected. After the initial workshop with the intervention group, the program was moved completely online. Because of this, the concluding workshop occurred via videoconferencing while initially designed to be in-person. Additionally, there was no in-person data collection post-intervention or at follow-up. Data was collected via online surveys and through qualitative interviews with feedback about the program. A program follow-up occurred 4 months after the concluding workshop.

Baseline Measures

Baseline measures were collected to provide information about the relationship between health behaviors and weight-related outcomes of mothers and children as well as to provide information about the overall health status of mothers. Mothers and their preschooler were invited to a pre-intervention health fair visit held at the child's preschool or a centralized community center for both the intervention location (n = 1) and 2 control locations. As outlined in the conceptual model in Figure 6.1, measures (survey and biological) are broken down by child outcomes, maternal outcomes, distal mediators, proximal mediators, and moderating variables.

1. Demographics: Maternal and child demographic information was gathered using a written survey that included age (date of birth), race, sex (male/female), and ethnicity. Maternal income status and education obtained were also collected.

2. Child Outcomes: Child outcomes included child weight status. Of note, child diet and activity may also fit in the conceptual model but are not reported here.
 - a. *Anthropometrics*: Child height and weight were measured during the pre-intervention health fair, as well, using a portable stadiometer (Seca Corp. Hamburg, Germany). These measures, along with age (date of birth) and sex (male/female), were used to calculate BMI percentile (EpiInfo software, v.7 CDC, Atlanta, GA).
3. Maternal Outcomes: Maternal outcomes included maternal health (anthropometrics, blood lipid and hemoglobin A1c (HbA1c) values, blood pressure, waist circumference, and overall CVD risk) as well as diet quality and time spent in moderate to vigorous physical activity (MVPA).
 - a. *Anthropometrics*: Height was measured to the nearest 0.1 cm in duplicate using a portable stadiometer (Seca Corp, Hamburg, Germany). Weight was measured to the nearest 0.1kg using an electronic scale (Lifesource ProFit UC321; Milpitas, CA). Participants removed their shoes and any heavy outer clothing. Body Mass Index (BMI) was calculated (National Institutes of Health, 1998).
 - b. *Blood Lipid Panel and HbA1c*: Mothers underwent a non-fasted fingerstick blood lipid panel to assess total and high-density lipoprotein (HDL) cholesterol, triglycerides, and HbA1c using two point-of-care machines (Alere Cholestech LDX and the Alere Afinion AS100, Alere North America, Scarborough, ME).
 - c. *Blood Pressure*: Blood pressure was measured 3 times using an automated blood pressure device and averaged (Omron 10 series automated monitor with semi-rigid cuff, Omron Healthcare, Inc).

- d. *Waist Circumference:* Waist circumference was collected at the level of the iliac crest in duplicate and averaged using a thin metal measuring tape designed for circumference measurements.
- e. *CVD Risk:* Two descriptive scores were calculated to quantify CVD risk factors. Maternal metabolic syndrome required the presence of ≥ 3 of 5 metabolic factors (an elevated HbA1c, hypertension, hypertriglyceridemia, low HDL cholesterol, and a larger waist circumference). These measures were compared to recommended cut-points for risk based on the National Cholesterol Education Program's Adult Treatment Panel III (NCEP ATP III). Additionally, HbA1c values were used in place of blood glucose levels due to participants' non-fasted states, and the triglyceride cut-point was adjusted to reflect non-fasted states. Maternal overall CVD Risk was calculated as a sum score (0-5) that included the 5 CVD risk factors outlined above. BMI was excluded from this score due to collinearity issues with waist circumference.
- f. *Maternal Diet Quality:* To measure maternal diet quality, two 24-hour diet recalls (the Automated Self-Administered 24-hour or ASA24⁴⁷) were conducted with a trained researcher. The Healthy Eating Index (HEI) was then applied to the ASA-24 to assess how well a set of foods relates with recommendations from the Dietary Guidelines for Americans⁴⁸. Scores range from 0-100, with the ideal score 100.
- g. *Physical Activity Levels:* PA was measured by, ActiGraph GT9X accelerometers (ActiGraph Co., Pensacola, FL, USA). Participants were asked to wear the accelerometer for a 7-day period on their non-dominant wrist and to maintain their regular activity patterns⁴⁹. A minimum of 4 days of activity data was required for

analysis, and mean 1-second acceleration magnitude data was used to determine the amount of time spent in various intensities of PA (moderate to vigorous activity or MVPA is reported in this chapter).

4. Distal Mediators: Distal mediators included behaviors relating to eating, PA, and self-care as well as a snap shot of the home food and activity environment and general perception of quality of life. These behaviors, environments, and perceptions were identified in the literature to be potential influences on actual diet quality, PA achievement, and overall health.
 - a. *Maternal Diet Behaviors*: The Three Factor Eating Questionnaire (TFEQ)⁴⁴ is a 51-item instrument, (modified to 18-item⁵⁰) that has been used to measure 3 dimensions of human eating behavior: cognitive restraint (the conscious restriction of food intake to control body weight), uncontrolled eating (the tendency to eat more than usual due to loss of control), and emotional eating (overeating during dysphoric or euphoric mood states). Responses use a Likert scale of 1 = definitely false to 4 = definitely true. Responses from the TFEQ-18 were calculated as a percentage of the highest possible value, between 0-100%, with higher percentage scores indicate greater tendencies toward cognitive restraint, uncontrolled eating, or emotional eating⁵⁰. The 18-item version has been tested and validated as a reliable measure of cognitive restraint, uncontrolled eating, and emotional eating (Cronbach's alpha > .7 for each dimension) among adults in the general population⁵⁰.
 - b. *Maternal PA Behaviors*: The Physical Activity Self-Regulation Scale (PASR-12) is a 12-item scale developed to assess self-regulation, a major construct of Social Cognitive Theory, as it relates to PA with items to represent 6 types of self-regulatory

strategies: goal setting, self-monitoring, time-management, eliciting social support, reinforcements, and relapse prevention⁵¹. Responses are recorded on a Likert scale of 1 = never and 5 = very often. It has been psychometrically tested and shown to be a valid and concise measure of self-regulation in PA in adult populations⁴⁵, and reliability measured by Cronbach's alpha was .94 among adult women⁵². Scores on this assessment range from 0-60, with 60 representing a higher level of self-regulation relating to PA.

- c. *Maternal Stress Management Behaviors*: The Mindful Self-Care Scale (MSCS) was used to assess stress management through the mindful awareness of personal needs and intentional engagement in practices to meet those needs⁵³. The MSCS is a 33-item questionnaire that has been psychometrically tested and validated and has 6 factors: physical care, supportive relationships, mindful awareness, self-compassion and purpose, mindful relaxation, and supportive structures⁵³. It uses a Likert Scale with 0 days = never and 6-7 days = always. Scoring of this scale leads to possible results of 0-150, with higher scores representing higher levels of mindful self-care. It has been psychometrically tested and validated, and is reliable with Cronbach's alpha coefficient was .89 for the total scale⁵³.
- d. *Home Food and Activity Environments*: The Home Inventory to Describe Eating and Activity (Home-IDEA3) is a self-report tool that has been found to be valid and reliable in assessing the home environment of low-income families with preschoolers with inter-rater reliability measured using Kappa scores ($k > 0.67$)⁵⁴. The Home IDEA3, evaluates food types (69 items), PA equipment (13 items), and measures the child's bedroom for electronic devices (e.g., television; 9 items)^{54, 55}.

- e. *Quality of Life:* The Satisfaction with Life Scale (SWLS) is a 5-item scale that measures global life satisfaction and subjective well-being and is used to assess perceptions of quality of life. It was developed by Diener and colleagues⁵⁶ and has been validated across various populations with an average Cronbach's alpha = .78⁵⁷. It uses a Likert scale with 1 = strongly disagree and 7 = strongly agree, and results from this measurement tool are scored between 0-49. Scores between 5-9 indicate the respondent is extremely dissatisfied with life, whereas scores between 31-35 indicate the respondent is extremely satisfied.
5. Proximal Mediators: Proximal Mediators included maternal behavioral capability, mindfulness, and self-efficacy were measured using Ecological Momentary Assessment (EMA). EMA is a methodology which allows for real-time assessment of fluctuations in behavior across time and context^{58, 59}. A total of 9 questions (2 relating to healthy eating, 2 relating to PA, and 5 relating to mindfulness using the MAAS) were developed for EMA, which were uploaded to Qualtrics (Qualtrics, Provo, UT), and a link to the survey was text messaged to participants. After the initial workshop, the Qualtrics survey link contained all 9 questions and was sent a total of 3 times, every other day, over the course of the week between the workshop and start of the coaching sessions. After each health coaching session, 2 questions for healthy eating and PA as well as 5 for mindfulness were sent that corresponded to the week's health coaching topic. Participant responses, the time of response, and the location of response were recorded.
- a. *Behavioral Capability:* Behavioral Capability, a key construct of SCT as the knowledge and skills to perform self-care behaviors⁶⁰, was measured for healthy eating, PA, and stress management. To assess awareness and satisfaction of healthy

eating, participants were asked to score their awareness of what they ate or how active they were that day and their satisfaction. A total of 4 questions were developed to assess momentary knowledge and skills of healthy eating (n = 2) and PA (n = 2) using a Likert scale of 1 = not at all aware / satisfied to 5 = completely aware / satisfied and administered via EMA.

- b. *Mindfulness*: The 5-item validated Mindful Attention and Awareness scale (MAAS) was used⁶¹. Responses are recorded using a Likert scale of 1 = not at all to 7 very much, and the MAAS is used to assess awareness, attention, and momentary mindfulness⁶². It was administered via EMA.
- c. *Self-efficacy*: Self-efficacy is another major construct of Social Cognitive Theory⁶³ and was measured at the end of each workshop and coaching session. Questions to assess self-efficacy were developed with expert input and used a Likert scale of 1 = no confidence to 7 = completely confident. Typically 3-4 questions were utilized each week, asking about participants' confidence in their ability to practice healthy eating, PA, or stress management. Responses were recorded by the health coach on evaluation instruments (Appendix XIII). Printed questions were distributed at the end of each workshop and completed individually.

6. Participant Characteristics (Moderators)

- a. *Perceived Stress*: The Perceived Stress Scale (PSS), a 10-item instrument, was used to understand the degree to which life situations are appraised as stressful. It has been psychometrically tested and validated in diverse groups including adults, college students, and in multiple languages, and has shown reliability in low-income adult populations (Cronbach's alpha = .78)⁶⁴. The PSS uses a Likert scale of 0 = never to 4

- = very often and is scored 0-40 with scores ranging 0-13 considered low stress, 14-26 considered moderate stress, and 27-40 considered high stress.
- b. *Biological Stress*: To capture measurements of the hormone cortisol as a marker of the stress response via the Hypothalamus-Pituitary-Adrenal (HPA) axis⁶⁵⁻⁶⁸, hair samples were collected at baseline and stored according to established protocols⁶⁸. Outcomes are not presented here.
 - c. *Parenting Daily Hassles*: The Parenting Daily Hassles (PDH) survey is used to measure the frequency and intensity of events considered to be a hassle experienced on a daily basis by adults caring for children. The scale is reliable (Cronbach's alpha = .81 in the original article) and valid⁶⁹, and frequency scores range from 0-80. Intensity scale is scored by adding the caregiver's rating for each item. The range is 0-100. Scores above 50 on the frequency scale or above 70 on the intensity scale indicate a high frequency and significant pressure over care⁶⁹.
 - d. *Maternal Depression*: To assess maternal symptoms associated with depression, the Center for Epidemiological Studies-Depression Scale (CES-D) was used. The CES-D is a valid 20-item measure designed for caregivers to rate how often over the course of the past week they experienced symptoms of depression such as restless sleep, poor appetite, or feelings of loneliness⁷⁰. It has been shown to be reliable (Cronbach's alpha = .9; Spearman-Brown split halves = .9) and valid across a variety of demographic characteristics (e.g. race) and has been tested with an adult population⁷⁰. Additionally, analyses reveal similar structural responses among and within groups. It uses a Likert scale of 0 = rarely or none of the time to 3 = most or almost all the time, and is scored 0-60, with higher scores indicating more depressive symptoms.

- e. *Health Literacy*: To assess health literacy, the Newest Vital Sign (NVS) was used which is a screening tool based on an ice cream nutrition label and accompanied by 6 questions. The number of correct responses is summed to produce a health literacy score. The NVS can be used as an interval scale with scores ranging from 0 (high likelihood of limited literacy) to 6 (adequate literacy), or a categorical variable of high likelihood of limited literacy (0-1), the possibility of limited literacy (2-3), and adequate literacy skills (4-6)⁷¹. Reliability (Cronbach alpha > .76) and criterion validity of the NVS have been established⁷¹.

Program Feasibility

A multiple methods approach was adopted to assess feasibility of the HEROs Self-Care intervention. Information on the feasibility of data collection methodologies (biological, survey, EMA, and process notes documentation), workshop and health coaching session facilitation (including adherence to script and fidelity scores scored out of 3 by a trained note-taker), and program retention at post-intervention and follow-up were gathered. Data informing feasibility is further outlined in Table 6.2.

Table 6.2. Feasibility Assessment of the HEROs Self-Care Program

Feasibility	Questions Answered
Data Collection	
Baseline Biological	Did participants complete biological measures?
Baseline Survey	Did participants complete survey measures?
EMA	Did participants complete EMA measures?
Process	Were process notes documented throughout the program?
Facilitating Workshops	Was it feasible to facilitate workshops?
Facilitating Health Coaching	Was it feasible to facilitate HC sessions?
Script Fidelity Scores	Did the facilitator follow the script?
Post-Intervention Retention Rates	What was the participant retention rate post-intervention?
Follow-Up Retention Rates	What was the participant retention rate at follow-up?

Process measures of fidelity and dose were collected throughout intervention implementation to inform feasibility of the intervention. Evaluation instruments were developed to assess fidelity of intervention delivery, dose delivered (e.g., number of coaching sessions and workshops delivered), reach (e.g., session attendance, type and number of goals set), and topics covered. These evaluation instruments can be found in Appendix XIII and include workshop notetaking and fidelity scoring for script adherence and facilitation as well as health coaching facilitation fidelity and space to record external factors (e.g., noises or distractions in the background).

Program Acceptability

Acceptability of the intervention and study procedures was assessed qualitatively. Interviews were used to explore participant affect (feelings about the program), perceived effectiveness of the program, and perceived changes in self-efficacy when practicing healthy eating, PA, and/or stress management. A 4-month follow-up occurred at the end of July 2020 with most mothers (n = 5; 83%). Due to COVID-19, the follow-up data collection did not take

place in person, rather, interviews were conducted to garner qualitative data on intervention acceptability, behavioral capability, self-efficacy, recommended program refinements, and continued use of intervention materials. The interview guide was developed with major intervention components in mind (program content, implementation strategies, and digital supports) as well as Social Cognitive Theory as a theoretical framework. Content validity of the interview guide was established via review by experts in the field of nutrition, intervention design, and mindfulness. The final guide consisted of 17 questions related to the HEROs Self-Care intervention as well as feedback on the HEROs intervention with a parent and child workshop on healthy eating and activity. Interviews were conducted by a trained researcher, averaged 35-40 minutes, were audio recorded, and transcribed verbatim (Datagain Services, 2019).

Data Analysis

All survey and biological data were entered and verified in REDCap (Research Electronic Data Capture, a database hosted by the University of Colorado). Continuous data was inspected for normality, and study data was examined for the full study sample and by the intervention vs control group. Means, standard deviations, and frequencies were computed for participant characteristics, maternal cardiovascular risk factors, and child weight status. Z-tests of the medians and chi-square tests were conducted to examine differences in factors by intervention group for biological and survey data. Survey data was organized by distal and proximal mediators as well as moderators. In terms of post-intervention interviews, a deductive content analysis approach was implemented⁷². Responses were sorted for each participant by question due to the structured nature of the guide, and two researchers independently reviewed the

compiled nodes to generate cumulative summaries by SCT construct and intervention component.

Section II: Baseline, Feasibility, and Acceptability Results

Baseline Measures

Baseline data were collected from 23 mother-child dyads in January and February 2020. In concordance with the Conceptual Model (Figure 6.1), demographics are presented in Table 6.3, and maternal and child outcomes are presented in Table 6.4. Table 6.5 presents collected data on distal mediators, and Table 6.6 outlines proximal mediator process data. No data beyond baseline descriptive statistics are reported here.

Demographics and Maternal and Child Outcomes

Maternal participants had a mean (SD) age of 32.6 years (± 5.8), were predominantly of low-income status (52%), 17.4% completed a high school education as their highest level of education, and 21.7% identified as Hispanic. Child participants had a mean age of 4.5 years, 52% were male, and 21.7% were identified as Hispanic. Full data are presented in Table 6.3.

Table 6.3. Maternal and Child Demographics for the HEROs Self-Care Intervention

	Full Study	Intervention	Control
	Percent (n)	Percent (n)	Percent (n)
Mother	Mean (\pm SD) n = 23	Mean (\pm SD) n = 6	Mean (\pm SD) n = 17
Age (y)	32.6 (\pm 5.8)	33.5 (\pm 3.5)	32.5 (\pm 6.1)
Race			
White	87% (20)	100% (6)	82% (14)
Black/African American	-	-	-
Asian	-	-	-
American Indian /Native			
Alaskan	4% (1)	-	6% (1)
Pacific Islander/Native	4% (1)	-	6% (1)
Hawaiian			
Other/Unspecified	4% (1)	-	6% (1)
Ethnicity: Hispanic	22% (5)	17% (1)	24% (4)
Low-Income ^a	52% (12)	67% (4)	47% (8)
Education			
\leq High School diploma	-	-	-
High school diploma/GED	17% (4)	17% (1)	18% (3)
Some college (no degree)	26% (6)	33% (2)	24% (4)
Occupational or Tech school	17% (4)	33% (2)	12% (2)
Associates degree	13% (3)	-	18% (3)
Bachelor's degree	26% (6)	17% (1)	29% (5)
Graduate or professional degree	-	-	-
Child			
Sex: Male	52% (12)	33% (2)	59% (10)
Age (months)	53.9 (\pm 8.4)	63.7 (\pm 3.4)*	50.2 (\pm 6.5)
Race			
White	87% (20)	100% (6)	82% (14)
Black/African American	4% (1)	-	6% (1)
Asian	4% (1)	-	6% (1)
American Indian /Native			
Alaskan	-	-	-
Pacific Islander/Native			
Hawaiian	4% (1)	-	6% (1)
Other/Unspecified	-	-	-
Ethnicity: Hispanic	22% (5)	17% (1)	24% (4)

^aLow-Income is defined by a household income of \leq 185% of the Federal income guideline for 2019 (U.S. Department of Health & Human Services Federal Poverty Guidelines, 2019⁷³),

There was a high prevalence of CVD risk factors, with 69.6% (n = 16) of participants presenting with 3 or more CVD risk factors. Prevalence of risk factors not meeting recommendations included, 60.9% (n = 14) had low HDL levels, 45.5% (n = 10) had elevated diastolic or systolic blood pressure values. Less prevalent factors included HbA1c, with 8.7% (n = 2) outside of recommended ranges and 26.1 % (n = 6) with high triglyceride levels. In addition to these factors, 59.1% (n = 13) of mothers had a BMI greater than or equal to 30.0 and 73.9% (n = 17) had high waist circumference, placing them in the obese range. For children, 39.1% were greater than the 85th percentile of BMI for their age and sex, categorizing these children as overweight or obese. Full data is presented in Table 6.4.

Table 6.4. Maternal and Child Outcomes for the HEROs Self-Care Intervention

	Full Study	Intervention	Control
	Percent (n)	Percent (n)	Percent (n)
Mother	Mean (\pm SD) n = 23	Mean (\pm SD) n = 6	Mean (\pm SD) n = 17
Waist Circumference (in)	41.0 (\pm 6.5)	39.8 (\pm 7.2)	41.4 (\pm 6.5)
High Density Lipoprotein (mg/dL)	42.2 (\pm 13.4)	45.7 (\pm 15.5)	49.2 (\pm 13.0)
Triglycerides (mg/dL)	152.6 (\pm 67.9)	133.2 (\pm 59.2)	159.5 (\pm 71.1)
HbA1c (%)	5.4 (\pm 1.4)	5.1 (\pm 0.4)	5.5 (\pm 1.6)
Systolic Blood Pressure (mmHg) ^b	119.9 (\pm 17.6)	122.1 (\pm 11.6)	119.1 (\pm 19.7)
Diastolic Blood Pressure (mmHg) ^b	82.8 (\pm 11.04)	86.7 (\pm 11.4)	81.4 (\pm 10.9)
Body Mass Index (BMI)	31.8 (\pm 6.4)	29.6 (\pm 6.1)	32.6 (\pm 6.5)
Underweight (<19kg/m ²)	-	-	-
Normal weight (19-24.9 kg/m ²)	14% (3)	33% (2)	6% (1)
Overweight (25-29.9 kg/m ²)	27% (6)	17% (1)	29% (5)
Obese (\geq 30 kg/m ²)	59% (13)	50% (3)	59% (10)
Metabolic Syndrome (\geq 3 factors)	70% (16)	67% (4)	71% (12)
CVD Risk (0-5)	3 (\pm 1.2)	3 (\pm 1.8)	3 (\pm 1.0)
MVPA (average minutes/ day)	28.0 (\pm 14.9)	34.2 (\pm 21.3)	25.8 (\pm 12.0)
Sleep (average hours/ night)	6.9 (\pm 1.1)	6.7 (\pm 1.2)	6.9 (\pm 1.1)
Healthy Eating Index	52.6 (\pm 10.5)	57.1 (\pm 11.5)	51.1 (\pm 10.0)
<u>Adequacy</u>			
Total Fruit (0-5)	1.8 (\pm 1.8)	1.3 (\pm 1.5)	1.1 (\pm 1.9)
Whole Fruits (0-5)	2.3 (\pm 2.3)	1.7 (\pm 2.3)	2.5 (\pm 2.3)
Total Vegetable (0-5)	3.8 (\pm 1.3)	3.9 (\pm 1.5)	3.8 (\pm 1.3)
Greens and Beans (0-5)	3.7 (\pm 2.0)	3.4 (\pm 1.9)	3.8 (\pm 2.0)
Whole Grains (0-10)	1.6 (\pm 2.4)	1.8 (\pm 2.4)	1.5 (\pm 2.4)
Dairy (0-10)	6.6 (\pm 2.9)	7.9 (\pm 3.3)	6.2 (\pm 2.8)
Total Protein (0-5)	4.9 (\pm 0.42)	4.7 (\pm 0.8)	4.9 (\pm 0.2)
Sea and Plant Proteins (0-5)	3.2 (\pm 2.2)	3.9 (\pm 2.0)	2.9 (\pm 2.3)
<u>Moderation</u>			
Fatty Acids (0-10)	4.1 (\pm 3.2)	4.8 (\pm 3.4)	3.8 (\pm 3.2)
Refined Grain (0-10)	7.2 (\pm 2.7)	8.3 (\pm 2.2)	6.8 (\pm 2.8)
Sodium (0-10)	2.1 (\pm 2.3)	2.5 (\pm 2.8)	1.9 (\pm 2.2)
Added Sugar (0-10)	7.3 (\pm 3.2)	8.6 (\pm 2.0)	6.8 (\pm 3.4)
Saturated Fats (0-10)	4.1 (\pm 2.8)	4.4 (\pm 4.0)	3.9 (\pm 2.4)
Child			
BMI Percentile ^d	61.1%	77.2%	55.4%
Underweight (<2.5th percentile)	4% (1)	-	5.9% (1)
Normal weight (2.5<85 th percentile)	57% (13)	50% (3)	59% (10)
Overweight (85 th <95 th percentile)	17% (4)	33% (2)	12% (2)
Obese (\geq 95 th percentile)	22% (5)	17% (1)	24% (4)

HDL: High Density Lipoprotein; HbA1c: Hemoglobin A1c; mmHg: millimeters mercury; BMI: body mass index; kg: kilogram; m: meter; CVD: cardiovascular disease; MVPA: moderate to vigorous physical activity

* The difference between the intervention and control group child age was statistically significant ($p = .003$).

Distal Mediators and Participant Characteristics (Moderators)

Distal mediators (e.g., maternal diet, PA, and stress management behaviors) and moderators (e.g., perceived stress and maternal depression) are reported in Table 6.5. In terms of stress, 74% (n = 17) of mothers perceived their stress levels as moderate at baseline, which was prior to the beginning of the COVID-19 pandemic. Hair cortisol samples were also collected (22/23 participants), but data is not presented here. Of note, the mean score on the MSCS that measures mindful self-care practice was 107.9 out of a potential for a score of 150. This value is higher than the median and may represent a greater perception level of or actual practice of self-care.

Table 6.5. Maternal Distal Mediator and Moderator Responses for HEROs Self-Care

Survey	Full Study Instrument Mean Category Mean or % (\pm SD) n = 23	Intervention Instrument Mean Category Mean or % (\pm SD) n = 6	Control Instrument Mean Category Mean or % (\pm SD) n = 17
Mindful Self-care (0-150)	107.9 (\pm 8.8)	110.7 (\pm 12.6)	106.6 (\pm 6.3)
Physical Activity Self-regulation (0-60)	32.2 (\pm 12.0)	34.8 (\pm 11.3)	31.1 (\pm 12.5)
Satisfaction with Life (5-9 Dissatisfied and 31-35 Extremely Satisfied)	25.6 (\pm 4.7)	25.2 (\pm 7.1)	25.7 (\pm 3.6)
3 Factor Eating Questionnaire (0-100%)			
Cognitive Restraint	49.4% (\pm 19.7%)	56.5% (\pm 31.9%)	46.4% (\pm 11.9%)
Uncontrolled Eating	34.8% (\pm 17.4%)	30.9% (\pm 21.0%)	36.5% (\pm 16.2%)
Emotional Eating	40.6% (24.8%)	29.6% (\pm 16.7%)	45.2% (\pm 26.7%)
Perceived Stress	16.6 (\pm 4.8)	16.3 (\pm 6.7)	16.7 (\pm 4.1)
Low (0-13)	22% (5)	33% (2)	18% (3)
Moderate (14-26)	74% (17)	50% (3)	82% (14)
High (27-40)	4% (1)	17% (1)	-
Maternal Depression (0-60)	13.7 (\pm 3.4)	13.7 (\pm 4.1)	13.7 (\pm 3.3)
Health Literacy	5.1 (\pm 0.97)	4.5 (\pm 0.84)	5.4 (\pm 0.93)
Limited Literacy (0-1)	-	-	-
Possible Limited Literacy (2-3)	9% (2)	17% (1)	6% (1)
Adequate Literacy (4-6)	91 % (21)	83% (5)	94% (16)
Parenting Daily Hassles			
Frequency (0-80)	41.2 (\pm 8.8)	44.3 (\pm 8.2)	39.9 (\pm 8.9)
Intensity (0-100)	38.2 (\pm 9.4)	40.2 (\pm 8.4)	37.4 (\pm 9.6)

Proximal Mediators

Proximal mediators included behavioral capability relating to healthy eating, PA, and mindfulness (awareness and satisfaction) as well as self-efficacy. For PA awareness, the Week 1 average was 2.9 (out of 4), and 2.7 after a health coaching session about PA. For PA satisfaction, the average score in Week 1 was 2.0 (out of 4) and was maintained after a PA health coaching session with an average of 2.2. In terms of healthy eating awareness, the Week 1 average was 3.6 (out of 4) and 3.5 after a health coaching session on the topic. For healthy eating satisfaction, the

Week 1 average was 2.3 (out of 4). After a health coaching session on healthy eating, the average for satisfaction was 2.2. Finally, Week 1 mindfulness scores ranged from 3.2 – 6.0 (out of 6) with an average of 4.7. After completing a health coaching session on stress management and mindfulness, the range of scores was 2.6 -6.0 with an average of 4.6.

For self-efficacy, Table 6.6 outlines average scores and the range of scores reported. Data were not gathered after the initial workshop.

Table 6.6. Self-efficacy Scores for the HEROs Self-Care Intervention

Intervention Timeline	Mean Score (Range 0-7)
After Goal Setting Health Coaching	5.6 (5.0 - 6.3)
After Healthy Eating Health Coaching	5.8 (4.8 – 6.0)
After Physical Activity Health Coaching	5.9 (4.3 - 7.0)
After Stress Management Health Coaching	6.1 (5.7 – 7.0)
After Concluding Workshop	5.6 (4.3 - 6.7)

Program Feasibility

Process data helped inform program feasibility in the categories of data collection, facilitation, and retention (Table 6.7). Fidelity average scores across major sections were 2.4 (of 3.0) for the initial workshop and 2.8 for the concluding workshop. In the first workshop, one activity was removed due to time constraints. In terms of dose delivered and reach for the workshops, 2 workshops were offered, and all 6 participants attended both for the entire duration (1 hour, 30 minutes). For health coaching sessions, a total of 23 out of 24 health coaching sessions were completed among all participants (mean 28 minutes, range 20-39 minutes), and 5/6 participants used videoconferencing software for each health coaching session. A total of 29 goals were set over the course of the health coaching sessions. In terms of PA, 16 goals were set (55.2%) including goals relating to step count, time spent in activity, and trying new types of PA.

For healthy eating, 5 goals were set (17.2%) including goals to introduce more whole grains and vegetables into meals and one goal to complete a Supplemental Nutrition Assistance Program (SNAP) application. For stress management, 8 goals were set (27.6%) including goals relating to prioritizing hobbies and setting time aside to unwind after the day. In terms of data collection, all methodologies functioned as intended with the exception of EMA. Response rates for all 3 EMA prompts were low every week, with the mode EMA completion rate for all 3 prompts at 33.3%. All other forms of data collection were gathered according to the evaluation plan outlined in the IM development stage of the intervention. Retention rates were 86% with 5/6 participants returning at 4-month follow-up to participate in data collection.

Table 6.7. Data Informing Feasibility of the HEROs Self-Care Program

Feasibility	Data	Interpretation
Data Collection		
Baseline Biological	<ul style="list-style-type: none"> 5/6 participants completed all biological measures 	<ul style="list-style-type: none"> All biological measures were collected but 1 hair sample
Baseline Survey	<ul style="list-style-type: none"> 6/6 participants completed all survey measures 	<ul style="list-style-type: none"> All participants completed survey measures
EMA	<ul style="list-style-type: none"> Mode EMA completion for all 3 prompts: 33.3% 	<ul style="list-style-type: none"> EMA completion rates were low for all prompts
Process	<ul style="list-style-type: none"> Process notes taken at HC and workshops 	<ul style="list-style-type: none"> Process notes were gathered on a preordained schedule
Facilitating Workshops	<ul style="list-style-type: none"> 2/2 workshops completed 	<ul style="list-style-type: none"> All workshops were completed (in-person and virtually)
Facilitating Health Coaching	<ul style="list-style-type: none"> 23/24 HC sessions completed 	<ul style="list-style-type: none"> All HC sessions but 1 were attended as scheduled
Script Fidelity Scores	<ul style="list-style-type: none"> 2.4/3 for initial workshop 2.8/3 for concluding workshop 	<ul style="list-style-type: none"> 1 activity and a few reflection questions were skipped due to time constraints A few reflection questions were skipped
Post-Intervention Retention	<ul style="list-style-type: none"> 100% retention rate at post-intervention 	<ul style="list-style-type: none"> All participants completed post-intervention measures
Follow-Up Retention	<ul style="list-style-type: none"> 83% retention rate (5/6) at follow-up 	<ul style="list-style-type: none"> All but 1 participant completed follow-up measures

Program Acceptability

Interviews (n = 5) revealed the program to be acceptable to the target audience. Key information about program acceptability fell into four major categories: 1) SCT Constructs 2) Program Feedback 3) COVID-19 Impact; and 4) Integration of Self Care program with other programming. This data and quotes are presented in Table 6.8. SCT constructs included behavioral capability, self-efficacy, and outcome expectancies. In terms of behavioral capability, mothers were aware of self-care but did not often prioritize it due to time constraints and prioritization of other family members. Because of this, mothers valued skill building opportunities for self-care practice as well as times to talk with other mothers and the health coach about self-care.

Table 6.8. HEROs Self-Care Post-Intervention Interview Findings with Quotes by SCT Construct and Intervention Component

Categories	Summarized Findings	Quote
SCT Constructs		
Behavioral Capability	Mothers were aware of definitions and practices self-care, but it was typically not prioritized or given time in daily schedules.	<p>“Just as far as making time for yourself, eating well, exercising, doing things to manage stress are all important. I think that I kind of put some of those on the back burner because of kids. In the program it helps me remember it doesn’t have to be an hour. It doesn’t have to be a long time. I can just take ten minutes to do some relaxing, breathing, or go for a little walk. That can really help with the stress management portion of it.”</p> <p>“Not much because, being a single mom, it was hard to get in self-care and...with four kids.”</p>
Self-efficacy	After participating in this program, mothers seem to feel more confident in being able to practice self-care.	<p>“...But hearing other people struggle with it [self-care] and talking to Savannah about some of the stuff to do, I feel even more confident.”</p> <p>“[I feel] fairly confident...When I feel stressed, I just take a moment and walk away and regroup and come back.”</p>
Outcome Expectations	Initial attraction to program stemmed from the opportunity to learn about self-care and how to implement self-care as well as seeking a social support network.	<p>“Just the whole learning experience. And I had a couple of other friends that were doing it, that were in the program. So, that we should do it, because we’re all be doing it. We all benefit from it.”</p>

Table 6.8. HEROs Self-Care Post-Intervention Interview Findings with Quotes by SCT Construct and Intervention Component

Categories	Summarized Findings	Quote
Program Feedback		
Pre-intervention Health Fair	Mothers found the health fair to be an important aspect of the program and helpful to guide health coaching and activities in the intervention.	<p>“I thought that was good. I was impressed with how comprehensive it was...I think it was good. It was eye opening as far as the diet stuff.”</p> <p>“I think it was an important part to actually know how your health is and to understand how important self-care is toward ourselves.”</p> <p>“I would have liked to see at least maybe one more [health fair]...as a wrap-up, catchup. How are you guys doing? A follow-up kind of deal at the very end.”</p>
What will participants walk away with?	Mothers will walk away from the program with increased awareness of the need to prioritize self-care and confidence to do so.	<p>“Probably the knowledge that I can carve out time for myself. It’s doable, and it shouldn’t be too daunting to do and just to start little and work up and make goals.”</p> <p>“Because I have four kids, and I work, and am a single mom. I wouldn't even try to take time for just me before. But now, even if it's just for a minute to just breathe, you need that time.”</p>
What would participants change about the program?	Mothers wanted more information related to healthy feeding and healthy eating for family members/ children.	<p>“It would be cool if you guys did a cooking class where you actually cook a healthy meal”</p> <p>“I think that maybe incorporating a little bit more of the picky eater and stuff like that and incorporating that into the healthy eating would be good to see.”</p>

Table 6.8. HEROs Self-Care Post-Intervention Interview Findings with Quotes by SCT Construct and Intervention Component

Categories	Summarized Findings	Quote
COVID-19 Impact		
	Some mothers described having greater capacity for self-care and reported using ideas from the program for stress-management.	<p>“I think it was a good year that they give us the manage stress. It also directed us a little bit to keep a consistency of we had to do this every week even if everything else was out of the normal. Being that we couldn’t go out or do anything, I used the ideas that I had to start doing what I wanted to do...”</p> <p>“It was okay. I felt bad because I would fall behind on my goals because we had to transition to homeschooling. I wasn’t able to accomplish everything I thought I would [with the program].”</p> <p>“I used it for myself because it has been so stressful...the mindful stuff. But also, it helped me and it helped my kids through it. Because before the self-care, if I wouldn't do stuff for me, I wouldn't be able to help my kids through something.”</p>

Table 6.8. HEROs Self-Care Post-Intervention Interview Findings with Quotes by SCT Construct and Intervention Component

Categories	Summarized Findings	Quote
Integration of Self-Care Program with Other Programming		
	Mothers were receptive to the HEROs program. Some mothers wondered if the program could be open to other family members, and some mothers felt the programs could co-occur, while others felt the programs should be separated to keep focus on each.	<p>“I think that sounds really cool. I think that would definitely be helpful. We have picky eaters, and that would be a good topic. I also think kids’ activity and helping people understand how much activity they actually need is a good thing, a good reminder.”</p> <p>“I think that it would be nice to have, especially if we were able to incorporate the entire family setting instead of just one of the children. I know that, if I was able to go in as a family and get everybody on the same page and we all go in – even if it was just me and my three kids, just be able to go in and do it together and have them actively participate”</p> <p>“But I feel if you do them together, you might lose some of your self-care and with the family information. You know what I mean? Instead of being just focused on that stuff, that would be spread out a little bit more.”</p>

Mothers also reported greater self-efficacy in self-care practice after the program, and overall, participants reported building confidence and skills to practice self-care during the HEROs Self-Care program. With outcome expectancies, participants were initially attracted to the program to learn about self-care, build self-care skills, and to establish a social network with other mothers.

Feedback on the HEROs Self-Care program revealed that the program fully met or exceeded participant expectations, with one mother stating: *“We did a lot more than I thought we would which was really cool, I thought.”* Participants found the results reported in the health fair to be helpful when setting and tracking goals with the health coach. Additionally, the concept of mindfulness was well received, and mothers reported using breathing techniques and awareness practices to cope with the stress of the COVID-19 pandemic. Not all mindfulness activities were remembered, however, and these could be further reinforced. Mothers reported wanting more information related to healthy feeding and eating for all members of the family (including picky eaters) as well as healthy recipe ideas, and some mothers felt the programs should co-occur. Some mothers wanted more touch points throughout the self-care program, including 1-2 more health coaching sessions and/or texting throughout the week with the health coach, though few completed the EMA surveys that were texted out to participants. With these recommendations for further refinement, participants also expressed enjoyment of the program and positive perceived effectiveness of the program.

Mothers were also asked to share their thoughts on the potential combination of the HEROs Self-Care program with a larger family health program targeting young child behavior, the HEROs Parent program. Mothers were receptive to the HEROs Parent program, though some mothers wondered about losing focus on their own self-care if the programs occurred

concurrently. Other mothers thought that getting resources to improve their children's eating and PA levels would help them practice their own self-care by making certain family duties easier or less chaotic. Some wondered if the programs could be open to all members of the family to better promote family health and wellness together. Overall, mothers were interested in expanding the information presented in the HEROs Self-Care program and valued the opportunity to learn more about health behaviors within the family context. In terms of combining the HEROs Self-Care program with the HEROs Parent Program workshops for mothers and children, all participants were interested.

Discussion

The objective of this chapter was to summarize baseline health characteristics and target behaviors as well as explore the feasibility and acceptability of the HEROs Self-Care program, through pilot testing with mothers of preschool-aged children with limited resources and living in rural communities. Mothers in the present study had high rates of CVD risk factors and obesity. Additionally, they did not meet diet or PA recommendations, outlining the need for an intervention like the HEROs Self-Care program to focus on maternal health. After piloting the program, data gathered revealed the program to be feasible and acceptable with the target audience, and mindfulness and self-care were acceptable approaches to diet, PA, and stress management behaviors.

Maternal health interventions in childhood obesity prevention efforts⁷⁴ and the use of self-care as a method for health promotion^{42, 43} represent important approaches to family health and wellness, and mothers found the HEROs Self-Care program acceptable in this regard. Many reported that their own self-care was tied to the health and wellness of their family, though it was often difficult to incorporate self-care into daily schedules. Through participation in the HEROs

Self-Care program, mothers shared that they had learned that self-care could occur in shorter timeframes throughout the day and include something as simple as momentary mindful breathing to relieve stress. Participants of the program reported misconceptions about the amount of time they needed to incorporate self-care into their schedules, and often did not prioritize self-care prior to the program due to these perceived time constraints. Perceptions of self-care are tied to cultural and societal trends that can influence self-care behavioral choices⁷⁵, which can lead to misconceptions about the incorporation of self-care into daily life. Recognition of self-care practice and self-care habit formation can play an important role in health behavior change⁷⁵, and behavior change interventions present effective approaches obesity prevention and health promotion^{8, 12}.

Targeting lifestyle behaviors has shown to be an effective method for obesity prevention¹², and the HEROs Self-Care program approached lifestyle modification through diet, PA, and stress management behaviors. Mothers from the target audience found these topics and methods used to be acceptable as evidenced by identified changes in self-efficacy, reported feelings about the program, and perceived effectiveness of the program. Post-intervention interviews with participants revealed that mothers felt more confident about being able to practice self-care after the program and that they walked away from the program with increased awareness of the need to prioritize their own care; though, self-efficacy scores did not reflect total confidence. Beyond participant report on the need and acceptability of a maternal self-care intervention, participant health data provided further context. With over half of this sample classified with an obese weight status, other chronic disease risk factors were also observed, including 70% of mothers presenting with 3 or more CVD risk factors. This presents a major public health concern as obesity and CVD risk factors are associated with chronic disease and

mortality⁵⁻⁷, and the presence of 3 or more CVD risk factors indicates metabolic syndrome⁷⁶. A high percentage of the sample had HDL, waist circumference, and blood pressure outside of recommended ranges. While the mean HbA1c value as a T2DM predictor was within normal range in this sample, large cross-sectional cohort studies with similar populations have found elevated HbA1c to be significantly related to prevalent CVD risk factors among women⁷⁷.

Further, obesity-related factors of diet quality, PA levels, and stress levels provided additional insight. Participants had low diet quality with average HEI scores of 52.6, below 59.0, the national average⁷⁸. Daily moderate-to-vigorous PA among the mothers averaged 28 minutes, below the recommendation of 30 minutes per day¹⁵. Additionally, 73.9% of mothers reported moderate levels of perceived stress at baseline. Findings from the HEROs Self-Care program are congruent with other studies indicating that many Americans are not meeting national diet and PA recommendations^{15, 48}. Moderate levels of stress are also associated with poorer diet quality³² and physical inactivity⁷⁹ along with obesity⁸⁰. Taken collectively, this population, while young, has significant risk factors for chronic disease and health promotion interventions are warranted.

In light of the need for health promotion programs such as the HEROs Self-Care program, the program was found to be feasible in facilitation, data collection, and retention. Anticipated barriers to program feasibility identified both in this project's needs assessment as well as in the literature included family time constraints, internet connectivity issues⁸¹, location of program meetings⁸², and matching of goals for health promotion between researchers and community members⁸³. Despite these potential challenges, the retention rate of participants through the end of the program was 100% and all meetings but one health coaching session was delivered as scheduled. While there were some internet connectivity issues, all health coaching

sessions and the final workshop was completed online, pointing to the usage of videoconferencing as a strategy for engaging rural populations.

Future Directions

The HEROs Self-Care program was both acceptable and feasible to meet the needs of mothers of preschoolers with limited resources in rural communities, and the piloting of the program revealed necessary modifications. For example, social support and time to discuss self-care tips with other mothers emerged as an important draw to the program for mothers but was not fully developed in the program. Social support has been shown to be an effective strategy for health promotion interventions^{84, 85} as well as an important aide in stress management⁸⁶, and group facilitation of the program to further social support for mothers was valued by participants. Further opportunities for program refinement included changes to specific programmatic topics, lengthening of the program, and enhancement to certain data collection methodologies. Specific recommendations for programmatic changes can be found in Appendix XIV.

Diet, PA, and stress management topics were well accepted during health coaching sessions. Members of the target audience seemed to have some background knowledge and pre-existing beliefs about what behaviors and practices could be classified as healthy diet and PA levels, despite evidence gathered in this pilot study pointing to their failure to meet recommendations. PA was a popular topic during health coaching sessions, and all mothers used their activity trackers to monitor their activity and PA-related goals. On the other hand, a major point of conversation with one participant about healthy eating related to food assistance programs, indicating that food access may be a concern for some members of the target audience. Other participants requested more information about healthy eating in the family

setting, healthy recipes, and what to do with children who are picky eaters. Thus, the HEROs Self-Care program could be integrated into or serve as a sister program to the larger HEROs Parent program focused on child-oriented topics. While diet and PA topics seemed acceptable to participants, more information was requested about healthy eating strategies.

In terms of stress management, participant reported averages of self-efficacy to practice stress management was the highest of all health coaching sessions. Mothers described instances where they used mindfulness and self-care techniques that they learned during the HEROs Self-Care program to help cope with stress, especially stress caused by the COVID-19 pandemic. Specifically, mothers noted pausing during moments of stress to practice the mindful breathing techniques and prioritizing time for themselves, which are consistent with both self-care⁴² and mindfulness⁸⁷ practices in stress reduction programming. Some content and activities for mindfulness were not well remembered by participants and present as possible areas for program refinement. These activities may have needed more time, explanation, and opportunities for participants to practice. Different facets of mindfulness (such as mindful eating or PA) could be strengthened and reinforced during the program because mindfulness has been shown to be an effective stress management strategy⁸⁸ and has even been used to promote healthy eating⁸⁹ and PA⁹⁰. Thus, additional mindfulness activities could be added, and the stress management health coaching session could be moved earlier in the program to provide participants with more time to engage with the topic and apply to subsequent content areas of healthy eating and PA.

Time constraints led to the removal of certain activities and lengthening the program by 2 health coaching sessions and an additional 30 minutes for each workshop could help facilitate the inclusion of all activities and provide time for other self-care topics. This is consistent with feedback from participants, some of whom requested an additional week or 2 of health coaching

as well as options for texting check-ins throughout the week outside of the scheduled meeting times. Certain data collection methodologies, such as completion rates for EMA, were unsuccessful and did not provide the intended level of momentary participant data. An opportunity exists to transform this data collection strategy into additional touch points with the health coach (e.g. a texted check-in 2-3 times per week). This could be used to gather the intended data while providing social support throughout the interventions instead of participants simply receiving a link to a survey. Other diet, PA, and/or stress management interventions have found success with 8-12 weeks (with various participant contacts per week) of programming, and with an average dose delivered of 120 minutes each week⁹¹⁻⁹³. Health coaching as an approach to lifestyle behavior change can be an even more effective method when the frequency of sessions or level of dose received is high and participant communication is multiple times per week⁹⁴.

Limitations and strengths to this research existed. To start, a limitation was that participants were recruited from 3 different sites and no cluster analysis has been performed (though no significant differences for each measure were found by group). Additionally, the HEROs Self-Care program did not consider other aspects of self-care, such as spirituality, relational, or educational self-care. Goals set by participants relating to these aspects were classified under stress management. The addition of health coaching sessions could expand upon these beneficial aspects of self-care. The COVID-19 pandemic may have influenced stress levels and the practice of self-care. Moreover, the HEROs Self-Care program was piloted with a small sample size. Interviews and feedback from the group provide justification for the program, but more work may need to be done within the targeted audience to confirm strategies. Despite these challenges, there were many strengths to this pilot study, as well. The consideration of maternal self-care in obesity research is not well studied, but mothers found the HEROs Self-Care

intervention acceptable and even enjoyable. Program feasibility was also assessed using multiple methods, and the use of process and fidelity forms during implementation of key intervention pieces (e.g., workshops and health coaching sessions) allowed for detailed notes to be analyzed after implementation. This feasibility data and participant input informed further refinement of the intervention.

Conclusion

Findings provided further context of the need for a maternal self-care intervention as the sample did not meet national recommendations for diet quality or PA levels and presented with high rates of obesity and multiple chronic disease risk factors. Pilot testing the intervention revealed the program to be feasible to implement in the face of potential barriers, with additional areas for programmatic refinement identified. Input from target audience members revealed the program to be acceptable and maternal self-care an important consideration in family health promotion efforts.

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CHAPTER 7: DISCUSSION

The present study involved the development of the HEROs Self-Care program for mothers of preschoolers as well as the investigation of the feasibility and acceptability of the program. Findings revealed that mothers in rural Colorado may have high rates of cardiovascular (CVD) risk factors, obesity, and stress, presenting a major public health concern as these are associated with chronic disease and mortality¹⁻⁴. Participants also had low diet quality and PA levels, supporting national reports indicating that many Americans are not meeting diet and PA recommendations^{5, 6}. This confirmed the need for an intervention that aimed to improve maternal health and health behaviors, and creative approaches to obesity prevention such as mindful self-care are warranted.

Understanding mothers' beliefs about the importance of self-care was a critical piece in intervention development. The needs assessment in the present study revealed that participants believed self-care to be important for personal and familial health and wellness. They articulated that time spent on caring for themselves helped with aspects like parenting, overall health, and provided a good role model of healthy behaviors for their children. Mothers that participated in the HEROs Self-Care program found the intervention to be a helpful reminder to prioritize their own self-care and described instances of using mindfulness and self-care to improve family diet quality, be more physically active as a family, and to manage stressful family situations. Overall, mothers articulated that their own behaviors and self-care practices were influential on their own wellbeing as well as that of their family, which is consistent with ecological and systems-focused understandings of familial influences on behaviors relating to obesity⁷⁻⁹ as well as with reported outcomes from regular self-care practice^{10, 11}. Maternal health is an important consideration, therefore, for childhood obesity interventions as mothers play a pivotal role in shaping dietary

and PA behaviors among young children^{12, 13}. Though, they are often not considered as a primary target in childhood obesity prevention programs as the intervention is focused on child behaviors and outcomes and not at the family level¹⁴. Because of this, mothers with limited resources living in rural environments are an important target for self-care interventions as a form of health promotion, especially in childhood obesity interventions that aim to consider the family system.

While the need for an intervention targeting maternal self-care is clear, barriers to self-care practice exist. For example, while participants in the present study believed in the importance of self-care for personal and familial health and wellness, barriers often impeded practice and led to the prioritization of the needs of others in the family. Time constraints, limited resource access (e.g. a gym, distance to grocery stores, or no available childcare), and family commitments were identified in the formative research phase of this study¹⁵ as well as possible limited internet connectivity or broadband issues in rural areas¹⁶ for health coaching sessions via videoconferencing. It was necessary, therefore, to integrate input from the target audience throughout program developmental stages, and the HEROs Self-Care program was designed to address these barriers to practice, identify supports to self-care, improve self-efficacy related to self-care, and to enhance skills related to practice. This involved making use of strategies such as virtual health coaching calls, flexible scheduling, and online resources to make participation easier. This study highlights supports and barriers to self-care as well as the inclusion of strategies in an intervention to overcome these all supported with target audience input.

Input from the target audience was incorporated throughout intervention development via Intervention Mapping (IM)¹⁷ and Plan, Do, Study, Act (PDSA)¹⁸ cycles. These frameworks also informed intervention strategies and approaches, allowing for the inclusion of theory and

audience-specific considerations into intervention components¹⁷. Interventions using quality improvement strategies such as PDSA cycles may avoid common implementation mistakes, design issues, or components that do not function as intended¹⁸ such as in the case of the study website. PDSA cycles can allow for a sequenced, experimental approach with feedback from audience members to identify both promising intervention components as well as components that could be strengthened prior to a full trial¹⁹. This can help to avoid programmatic issues¹⁷ and improve audience uptake of desired behaviors through the enhancement of program effectiveness and implementation¹⁸. Not only did these approaches effectively tailor content, implementation strategies, and digital supports to the target population, but also presented an effective example of assessing multiple intervention components simultaneously for targeted improvement.

Intervention components were used to promote healthy diet, PA, and stress management (mindfulness) behaviors. In terms of maternal diet and PA behaviors in health coaching, members of the target audience seemed to have some background knowledge and pre-existing beliefs about what behaviors and practices could be classified as healthy. During the pilot study, PA was a popular topic among participants, and all mothers made use of the provided activity trackers. Diet as a topic was less popular among participants, and a health coaching session with one participant related only to food access, indicating food security may be a primary concern and barrier to healthy eating for some members of the target audience. This is consistent with the literature that points to the idea that populations in rural environments face unique barriers to diet, PA, and stress management practices that should be considered in interventions²⁰.

With mindfulness, some mothers were familiar with the concept, but few reported practicing mindfulness on a consistent basis. Data from the pilot revealed high levels of stress within this population and mothers also reported finding mindful breathing useful after the pilot

study, especially during the COVID-19 pandemic. Techniques beyond mindful breathing, however, were not as well used. Self-care²¹ and mindfulness²² have gained popularity in modern culture and have been used for stress management and wellbeing interventions in the literature²³. Evidence exists of the association of mindfulness with improved health outcomes including improvements in chronic pain regulation²⁴, stress reduction²⁵, fatigue²⁶, PA levels²⁶, and mindful eating²⁷. Interventions that incorporate mindfulness and mindful awareness may lead to healthful behavior change, such as healthy eating²⁸, PA²⁹, and stress management²⁵. Some studies have even approached the family system, finding parental stress management to be a potential intervention point in childhood obesity for lower income populations^{30, 31}. The HEROs Self-Care program added to this body of evidence by incorporating mindful self-care strategies to approach diet, PA, and stress management behaviors and by tailoring this program to groups in rural environments. Interventions that intentionally utilize mindfulness techniques should consider participants' previous engagement with the topic and allow for ample opportunities to practice these skills.

There were other lessons learned from the design and piloting of this intervention. First, we heard resoundingly that this sample values social support and a sense of community. These strategies could be incorporated further into the intervention, and more research is needed into the development of social support through digital strategies such as videoconferencing technology during an intervention. Second, many mothers reflected that as a caregiver, they often seek to prioritize those cared for and limit practice of self-care behaviors to do so. More research could further explore this prioritization and societal influences on the role of caregiver regarding self-care practice. Finally, some pieces of the intervention either did not function as intended or missed their mark (especially with changes made to ensure participant and staff safety during the

COVID-19 pandemic³²) - from data collection strategies, to digital supports, to content topics. Proposed refinements outlined below should be considered for future renditions of the HEROs Self-Care program.

Future Directions

The development and piloting of the HEROs Self-Care program identified areas that were feasible and satisfactory to participants as well as gaps and areas for improvement. Because the HEROs Self-Care program was initially designed to be a part of the larger HEROs intervention, the program was purposely designed to be short in duration so topics could fit within the larger intervention (though it was assessed separately). Evidence emerged, however, to support the expansion of topics in the HEROs Self-Care program such as additional healthy eating information for the entire family and further incorporating mindfulness as a stress management tactic into daily routines.

Expanded topics may be considered if the HEROs Self-Care program is not combined with the larger HEROs program or the two could be more integrated. Some mothers requested more information about healthy eating in the family setting, healthy recipes, and what to do with children who are picky eaters. These topics were originally a part of the larger HEROs intervention³³, and participant requests for topics in family health supported the combination of the programs or incorporation of some resources from the larger HEROs intervention into the HEROs Self-Care program. With implementation strategies, additional health coaching sessions and workshop duration may allow for expanded self-care topics to be discussed. If the HEROs Self-Care program is to exist separately from the larger HEROs program, it should be lengthened by 2 health coaching sessions and 30 minutes on each workshop, confirmed by members of the

target audience. Evidence for dose and frequency of interventions utilizing health coaching is varied. Some studies support that 8-12 week coaching session interventions may be an effective duration for behavior change^{34, 35}. Other health coaching interventions have lasted between 3 and 18 months³⁵ and administered 60-minute sessions 3 times per week³⁶ or conducted 30-minute sessions at 6-week intervals³⁷. Further research is needed to compare varying dosage and frequencies of health coaching interventions.

For digital supports, mothers reported that they enjoyed the digital supports of tablet applications, activity tracker, and website, but when probed further, only one mother had actually made use of the study website and tablet applications (beyond the activity tracker application). These positive responses but limited usage may point to some level of social desirability in audience member input. Further, because these digital components were not central to the intervention, better incorporation of these elements presents an opportunity for modification of the HEROs Self-Care intervention. These could be better included in the intervention moving forward, and study materials and information could be accessible via digital supports to better lead participants to them. Websites and tablet or phone applications have been used to deliver health intervention content^{38, 39}, but limited website engagement and usage among study participants may vary by demographic characteristics such as race, ethnicity, and/or education level⁴⁰. Thus, more information is needed to find effective strategies to encourage usage of study websites including what factors may drive people to engage with a website and what barriers to usage exist⁴⁰. Additionally, more information could be gathered about the necessity for study-provided activity trackers (as some participants owned trackers of their own). Often, trackers use unique algorithms to calculate and measure health metrics⁴¹. For example, the Garmin VivoSmart4 Activity Tracker was chosen for its ability to measure stress levels. Despite these

differences among trackers, the data collected was used individually during health coaching calls and not compared among participants. More research is warranted on the usability of participant-owned activity trackers.

In terms of extended program application, holistic approaches to self-care can be helpful strategies for improving physical health and wellness⁴². In the HEROs Self-Care program, participants set goals that did not fall specifically within the healthy eating, PA, and stress management parameters, including other forms of self-care (e.g., meeting basic needs, relational, creative, or educational forms of self-care). For example, social support as a relational form of self-care along with time to discuss self-care tips with other mothers emerged as an important factor and draw to the program for mothers but was not a main focus of the intervention content initially. Social support has been shown to be an effective strategy for health promotion interventions^{43, 44} as well as an important aide in stress management⁴⁵, and group facilitation of the program to further incorporate social support for mothers could be reflected more intentionally in the program. One mother also worked with the health coach on signing up for food assistance services, indicating that food access could be a concern for some members of this target audience. Thus, health coaches working with limited resourced groups should be trained to offer support outside of diet, PA, and stress counseling. It may be beneficial to have a list of global resources for participants to utilize if limited resourced. Consideration of other forms of self-care could provide a more holistic approach to wellness and strengthen efforts relating to diet, PA, and stress management behaviors⁴².

In future research, after refinements, the HEROs Self-Care program could be tested with larger audiences. Further, the program was designed to help mothers prioritize self-care amidst busy schedules and barriers to practice, and mothers reported that it did. With evidence from the

pilot study revealing online coordination of health coaching sessions and a workshop delivered on a tablet to be both acceptable and feasible, the program could be moved completely online. Remote workshops and health coaching sessions could improve program flexibility and access. The program could also be adjusted to meet the needs of other family members (e.g., fathers, caregivers in the home, etc.) to further address health within the family system, or could be expanded to other populations that make up a child's community system such as teachers or school staff members. A list of recommended changes can be found in Appendix XIV.

Strengths and Limitations

There were limitations and strengths to this work. A limitation existed with the small sample size of the pilot study. Because of this, data was difficult to interpret and has limitations. While the intervention was confirmed within this target audience, more work is warranted as this sample size was quite small, and the HEROS Self-Care program may also need further refinement to meet the needs of other populations. Though the original intent was to conduct a full pilot study with a larger sample size, the COVID-19 pandemic limited research and recruitment of a full pilot sample. In addition to the COVID-19 pandemic preventing further testing of the intervention, the final program workshop was moved online and the stress of the pandemic may have influenced survey responses. Other limitations exist with qualitative methodologies such as selection and response bias. Mothers that responded to recruitment efforts may have already had a level of interest or investment in self-care, and input may not reflect those that were less enthusiastic about self-care or who had not thought about it. With response bias, some mothers reported loving the website, but when probed further, only one had used it. There may be some degree of social desirability in responses, though efforts were taken to

mitigate this such as having a trained interviewer that was not involved in the intervention. Strengths of this research included the consideration of maternal self-care in obesity research, especially after identifying self-care as an acceptable concept to these mothers in this rural setting. Another strength included the use of multiple methods to inform programmatic acceptability and feasibility. Qualitatively this included post-intervention interviews and process notes to complement quantitative health and survey measures. Additionally, target audience input was utilized at multiple stages of development. Finally, the intervention made use of robust frameworks for public health intervention development, combining both IM and PDSA cycles together to inform program design and refinement to meet the needs of target audience members.

Conclusion

Maternal self-care as a form of health promotion is an important target for childhood obesity prevention efforts, and mindful self-care is a useful strategy to encourage healthy eating, PA, and stress management behaviors. A small sample of mothers with limited resources residing in rural Colorado specifically valued self-care and believed it to be important for their own individual and family health, but barriers to practice existed, however, and self-care is not often prioritized. Additionally, high rates of CVD risk factors and obesity among this sample highlighted the need for the prioritization of self-care as healthy eating, PA, and stress management behaviors. The HEROs Self-Care program was designed, therefore, to target maternal mindful self-care as a method for childhood obesity prevention efforts, with consideration for these audience-specific barriers to practice. IM and PDSA cycles were used to incorporate target audience input at every stage of design and refinement. This resulted in an acceptable and feasible intervention that fit the needs and preferences of this target audience.

Although the study found the HEROs Self-Care intervention to be acceptable and feasible, health and wellness data collected informed the need for a mindful self-care program, and further studies are therefore warranted to determine the effectiveness of a mindful self-care intervention in obesity prevention efforts.

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APPENDIX I: IRB APPROVAL FOR THE HEROS STUDY



eProtocol
Office of the Vice President for Research
321 General Services Building - Campus Delivery 2011 eprotocol
TEL: (970) 491-1553

DATE: September 22, 2020
TO: Bellows, Laura, 1571 Food Sci and Human Nutrition
McCloskey, Morgan, 1571 Food Sci and Human Nutrition, Pagliassotti, Michael, 1571 Food Sci and Human Nutrition
FROM: Chance, Claire, CSU IRB 2
PROTOCOL TITLE: Bridging Home and Preschool Environments to Promote Healthy Eating and Activity Behaviors and Prevent Obesity in Early Childhood
FUNDING SOURCE: None
PROTOCOL NUMBER: 19-9275H
APPROVAL or DETERMINATION PERIOD: September 22, 2020

NOTICE OF IRB REVIEW FOR HUMAN RESEARCH

Thank you for submitting your application for expedited review to our Colorado State University Institutional Review Board (CSU IRB)(FWA0000647). We appreciate the work you have done on your proposal. The IRB has reviewed your submitted IRB application and all ancillary materials. As the nature of the research met the requirements for expedited review under provision Title 45 CFR 46. 110, Category 5, 7 of the federal Protection of Human Subjects Act, the IRB conducted a formal, but expedited, review of your application materials.

Based upon our review, your IRB application has been approved. The IRB approval begins today September 22, 2020, and expires on September 02, 2022.

Your research must be conducted according to the proposal that was submitted to the IRB. If changes to the approved protocol occur, a revised protocol must be reviewed and approved by the IRB before implementation. For any proposed changes in your research protocol, please submit an amendment to the IRB. Please be aware that changes to your protocol may prevent the research from qualifying for expedited review and may require a submission of a new IRB application or other materials to the IRB. If contact with subjects will extend beyond September 02, 2022, a continuing review must be submitted at least one month prior to the expiration date of study approval to avoid a lapse in approval.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite the best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete written explanation of the event and your written response. Other actions also may be required depending on the nature of the event.

Please refer to the protocol number denoted above in all communication or correspondence related to your application and this approval. Should you have additional questions or require clarification of the contents of this letter, please contact the IRB Office. On behalf of the IRB, I wish you success in this scholarly pursuit.

Please direct any questions about the IRB's actions on this project to:

IRB Office - (970) 491-1553; IRB@mail.colostate.edu

Claire Chance, Senior IRB Coordinator - (970) 491-1381; Claire.Chance@Colostate.edu

APPENDIX II: THE SELF-CARE INTERVIEW SCRIPT TO INFORM INTERVENTION MAPPING

Date:

Introduction:

Hi my name is _____ and I am calling on behalf of Colorado State University and the HEROs study. I called/texted/mailed you about participating in an interview about your practices and thoughts related to self-care.

Are you interested in completing a phone interview still? It will take about 30-35 minutes. You will receive \$20 for completing the interview.

[If no] Ok. Thank you for your time in [completing the other part of the research project]. Your input was very helpful to us.

[If yes] Is this a good time or would you rather set up another time that would work better for you?

[if now is not a good time, ask when is a good time to call back, schedule that time, say thank you and goodbye; if yes, continue with script]

Reschedule time:

Date:

Before we get started, let me tell you a little more about your participation in this study.

- The goal of today's interview is to gain an understanding of how you view self-care and your general practices related to self-care. By completing this interview, you will help staff at Colorado State University identify opportunities to improve the health of families with young children.
- This interview is entirely voluntary and you may stop at any point. There are no known direct benefits or risks for completing this interview.
- Your name will not be used in any way. All information from the interviews, including notes, will be kept in a locked cabinet at Colorado State University. All information provided by you will be fully confidential and used for research purposes only. Instead of using your name, your information will be assigned a number so that it remains confidential.
- If you have any questions about the study, please do not hesitate to use the contact information for Laura Bellows (study director) or the CSU institutional Review Board Coordinator that were listed on the interest form you filled out. If you would like their contact information again, I can also provide it to you now (*Laura Bellows: 970-491-1305; IRB Coordinator: RICRO_IRB@mail.colostate.edu; 970-491-1553*).

If at any time you have a question, or need me to stop, please let me know. Do you agree to participate in this interview?

Verbal Consent: **YES** **NO**

If verbal consent is yes,
continue with Interview

If it's okay with you, we would like to tape this interview. This is so we can go back and make sure we didn't miss anything. Are you OK with the tape recording?

Permission to Record: **YES** **NO**

Recorder Turned On: **YES** **NO**

Introduction:

Great. Thank you. I wanted to start by telling you a little bit about me. My name is _____ and I am working on a degree in nutrition. I love studying, but sometimes it's definitely challenging! My favorite part is when I get to talk to people in interviews like this.

In this interview, we are interested in learning more about your self-care, stress management, healthy eating, and physical activity practices. Several people in our lab have children and know firsthand the joys and struggles of raising young children! There is no judgement surrounding any answers that you might give to any of the questions that I will ask. We would just like to know a little bit more about what you, as a parent, do for yourself, and what your thoughts, practices, beliefs, and motivations related to self-care are.

- We would like to use your input, and that from other parents we talk to, to develop a program for parents of young children to provide information and strategies for parents to best take care of themselves.
- Please know that there are no right or wrong answers to any of the questions I will ask you.
- Your experiences and opinions are what are important to us.
- How does this sound so far?

<p>Icebreaker Questions:</p> <p>To start, I wondered if you might tell me a little more about you and the members of your family.</p> <ul style="list-style-type: none"> a. Prompt: Besides you and [name of preschooler], who else lives with you? b. Prompt: What are some things you and [name of preschool child] like to do together? 	
<ul style="list-style-type: none"> 1. What types of things do you do to take care of yourself? Behavioral Capability <ul style="list-style-type: none"> a. Prompt: [If response is nothing] If you could do something, what would be ideal? b. Prompt: How do these fit into your typical schedule? Behavioral Capability c. Prompt: Of these, which is most difficult to incorporate into your routine? Behavioral Capability d. Prompt: What helps you to be able to do these things? Behavioral Capability e. Are there friends or family that help encourage you to take care of yourself? Social Support <ul style="list-style-type: none"> i. Prompt: If so, which friends/family provide the most support? How do they encourage you to take care of yourself? Social Support 	

I. Self-care

Thank you for sharing! Based on what you told me about you and your family, you sound pretty busy! First, I'd like to talk about your thoughts and experiences of self-care, especially as a parent of a preschooler. How does this sound?

<p>2. When you hear the term self-care, what comes to mind? Behavioral Capability</p> <p>a. Prompt: Some people define self-care as the practice of working on one's own well-being, health, and happiness. What are your reactions to this? Behavioral Capability</p>	
<p>2. How important to you is it to be able to do [x,y,z from Q2] to take care of yourself? Outcome Expectations</p> <p>a. Prompt: You mention the importance of _____, why is that important? Outcome Expectations</p> <p>b. Prompt: How does your own self-care relate to your family? To your child? Outcome Expectations</p> <p>c. Prompt: We have heard from people that they prioritize taking care of their child first, their significant other, and then themselves last. From others, we've heard that taking care of themselves is an equal priority to taking care of others. Which of these relates best to you? Why?</p>	
<p>3. What you have mentioned so far are important aspects of self-care. How does _____ fit with self-care?</p> <p>a. Stress management?</p> <p>b. Healthy eating?</p> <p>c. Physical activity?</p>	

Thank you for sharing. We are now going to discuss each of these topics in a bit more detail. We'll talk about how stress-management, healthy eating, and physical activity fit in to self-care. First, we'll talk about [SM, HE or PA].

Section II: Stress Management

<p>4. During an average week, what sorts of things might cause you stress?</p> <ul style="list-style-type: none"> a. Prompt: Are there any things specific to family life that cause stress? Parenting? b. Prompt: Are there certain times of the day (i.e. bedtime, mealtime, getting kids off to school in the morning, work, etc.) that are more stressful? If so, what times? What activities? 	
<p>5. People show stress in different ways. When you're stressed, how does that come out?</p> <ul style="list-style-type: none"> a. Prompt: How do you know it (i.e. muscle tension, short with other people, sleep poorly, etc.)? 	
<p>6. What types of things do you do to manage stress caused by [Question 5 Response]? Behavioral Capability</p> <ul style="list-style-type: none"> a. Prompt: What skills do you rely on to manage your stress? Behavioral Capability—skills <ul style="list-style-type: none"> i. Skills might include things like time management skills, coping skills, or other skills. ii. Some people use a mindfulness approach to stress-management. What do you think of when you hear the term mindfulness? <ul style="list-style-type: none"> 1. Have you used mindfulness before? If so, which situations have you used it in? 2. Are you interested in learning more about this approach? b. Prompt: What resources might be helpful in better managing your stress? Behavioral Capability <ul style="list-style-type: none"> i. Prompt: Resources might include things like people to help you, a journal or planner, or other resources. c. Prompt: How might these resources and skills help you manage stress? 	
<p>7. How confident are you in using these strategies or resources (list X,Y,Z just mentioned) to manage your stress? Self-efficacy</p>	

<p>8. Who in your life helps you manage stress? Social Support</p> <ul style="list-style-type: none"> a. Prompt: Do you feel like you have enough support to manage stress? b. Prompt: What types of things would help enhance your support to manage stress? <ul style="list-style-type: none"> i. Prompt: Would an opportunity to talk with other parents of preschoolers (e.g. meet at park, meet-up, or play date) help you with stress management? If so, how? Social Support—intervention 	
<p>9. What types of things do you do to manage stress caused by [Question 5 Response]? Behavioral Capability</p> <ul style="list-style-type: none"> a. Prompt: What skills do you rely on to manage your stress? Behavioral Capability—skills <ul style="list-style-type: none"> i. Skills might include things like time management skills, coping skills, or other skills. ii. Some people use a mindfulness approach to stress-management. What do you think of when you hear the term mindfulness? <ul style="list-style-type: none"> 1. Have you used mindfulness before? If so, which situations have you used it in? 2. Are you interested in learning more about this approach? b. Prompt: What resources might be helpful in better managing your stress? Behavioral Capability <ul style="list-style-type: none"> i. Prompt: Resources might include things like people to help you, a journal or planner, or other resources. c. Prompt: How might these resources and skills help you manage stress? 	
<p>10. How confident are you in using these strategies or resources (list X,Y,Z just mentioned) to manage your stress? Self-efficacy</p>	
<p>11. Who in your life helps you manage stress? Social Support</p> <ul style="list-style-type: none"> a. Prompt: Do you feel like you have enough support to manage stress? b. Prompt: What types of things would help enhance your support to manage stress? <ul style="list-style-type: none"> i. Prompt: Would an opportunity to talk with other parents of preschoolers (e.g. meet at park, meet-up, or play date) help you with stress management? If so, how? Social Support—intervention 	

Section III: Physical Activity

Next, I have a couple of questions about physical activity.

<p>12. During an average week are you able to be physically active?</p> <p>a. Prompt: [If yes] What kinds of physical activity do you do? Behavioral Capability</p> <p>i. Prompt: Is this the right amount for you?</p> <p>b. Prompt: [If no] Are there activities you wish you could do more of?</p> <p>i. What prevents you from doing more of _____?</p> <p>c. Prompt: How do your personal habits relate to your family's? Your child's?</p>	
<p>13. When you are able to be active, what is it that helps you be physically active?</p> <p>a. Prompt: Having a friend to do it with, time away from kids, place to do it, etc. Social support/ Behavioral Capability</p> <p>b. Prompt: What barriers do you face in being as physically active as you want? Behavioral Capability</p>	
<p>14. How confident do you feel in overcoming these barriers? What is the reality of being able to do _____ (State what was mentioned by participant)?</p> <p>Self-efficacy</p>	
<p>15. How do friends and family help or not help you to be physically active</p> <p>Social support</p>	

Section IV: Healthy Eating

Next, I have a few questions about healthy eating.

<p>16. Over the past week, what did your eating habits look like?</p> <p style="margin-left: 40px;">a. Prompt: Are your habits right for you or are there things that you wish you ate more or less of?</p> <p style="margin-left: 80px;">i. What prevents you from doing more of_____?</p> <p style="margin-left: 80px;">ii. What prevents you from avoiding _____?</p> <p style="margin-left: 80px;">iii. How do your personal habits relate to your family's? Your child's?</p>	
<p>17. When you are able to eat healthy, what helps you eat healthy? What circumstances? Behavioral Capability</p> <p style="margin-left: 40px;">a. Prompt: When you aren't able to eat as healthy, what barriers do you face to eating as healthy as you would like? Behavioral Capability</p>	
<p>18. How confident do you feel in overcoming these barriers? What is the reality of being able to do _____ (State what was mentioned by participant).</p> <p style="margin-left: 40px;">a. Prompt: Avoid unhealthy behaviors? Self-efficacy</p>	
<p>19. How do friends or family help or not help you to eat healthfully? Social Support</p> <p style="margin-left: 40px;">a. Prompt: Do you feel like you have enough support to eat healthfully?</p>	
<p>20. When you are able to eat healthy, what helps you eat healthy? What circumstances? Behavioral Capability</p> <p style="margin-left: 40px;">a. Prompt: When you aren't able to eat as healthy, what barriers do you face to eating as healthy as you would like? Behavioral Capability</p>	
<p>21. How confident do you feel in overcoming these barriers? What is the reality of being able to do _____ (State what was mentioned by participant).</p> <p style="margin-left: 40px;">a. Prompt: Avoid unhealthy behaviors? Self-efficacy</p>	
<p>22. How do friends or family help or not help you to eat healthfully? Social Support</p> <p style="margin-left: 40px;">a. Prompt: Do you feel like you have enough support to eat healthfully?</p>	

Section V: Intervention Content

Our final section is about a program that we are developing.

<p>23. We are developing a program for families of preschoolers related to healthy eating and physical activity. Through some of our previous work, we heard from parents that taking care of themselves was an important part of taking care of their families. That said, many struggled with similar things that you mentioned – time, skills, knowledge, social support, etc. As part of this program we are developing, we are interested in providing parents with information and activities related to self-care, specifically healthy eating, physical activity and stress management.</p> <ul style="list-style-type: none">a. Prompt: What are your initial reactions to something like this?b. Prompt: Would you be interested in something like this? Outcome-expectancyc. Prompt: Is there specific type of information related to _____ that would be helpful to you?<ul style="list-style-type: none">i. healthy eating,ii. physical activity, oriii. stress managementiv. otherd. Prompt: What would be the best way to provide this information to you? For example, to list a few ideas: information could be delivered in a workshop, through web materials, via text reminders, or in other ways.	
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Thank you! This has been very helpful. I have just a few more questions on more specific information about this program we are developing.

Section VI: Intervention Mode of Delivery

<p>24. Health fair: One thought we had was to start the program off by having a health fair at the school, where participants could have things like blood pressure, cholesterol, diabetes risk, and diet assessed. What are your thoughts about this?</p> <ol style="list-style-type: none"> Prompt: If we could give you this information, would it be of value to you? Is it something you want to get? Prompt: Would there be anything else you would want to know about? Prompt: How often do you have these measured by a doctor or nurse? Prompt: Would you want help knowing what to do with this information? What would you typically do with this information? Prompt: What would be the best way to provide these results to you? <ol style="list-style-type: none"> Some ways to provide the results from the health fair could be in a written handout, a phone consultation with health professional (i.e. dietitian, counselor, exercise specialist), or in another way. 	
<p>25. We are hoping to incorporate Health Coaching in to this program where people could meet one on one with a wellness specialist to set goals and talk about health. What are your thoughts about this?</p> <ol style="list-style-type: none"> What might you want health coaching to consist of? What are your thoughts on if a phone or video chat (FaceTime) would be useful method of having these coaching sessions? What length and frequency of coaching sessions would work best for you? <ol style="list-style-type: none"> Prompt: 1 time per week? Prompt: 30 minutes per time? Prompt: total number of sessions? 4? 	

<p>26. If we were to develop resources online, what types of information/resources would be most helpful?</p> <ul style="list-style-type: none"> a. Prompt: Would a website with written materials, suggestions for apps, videos, or other resources be helpful? b. Prompt: What about social media? What would be useful to you on social media? <p>Social Support</p> <ul style="list-style-type: none"> c. Prompt: Would you be interested in attending workshops (face-to-face) or having most of the information available online? <ul style="list-style-type: none"> i. Are there any other resources or information that might be helpful to receive in a program with regard to the topics we just talked about? <p>Behavioral Capability</p>	
<p>27. Are there any other resources or information that might be helpful to receive in a program with regard to the topics we just talked about? Behavioral Capability</p> <ul style="list-style-type: none"> a. Prompt: If we gave you an activity tracker (like a FitBit) would that be helpful? b. Prompt: Some parents have told us that resources regarding what to do to take care of yourself if you get 30 seconds free, 2 minutes free, or 5 minutes free would be helpful. What are your thoughts on something like this? <ul style="list-style-type: none"> i. Some parents mentioned having these bursts of time when their child is in the bath, or while dinner is cooking. Where are these moments of free time throughout your day? ii. If you could use these moments even just one time a day, would you do it? 	

Conclusion:

(If there is confusing or conflicting information, summarize what you heard and revisit their answers.)
That's it. We are all done with my portion of the interview. Is there anything else that you would like to share with me? Any questions you may have? Thinking back through everything we've talked about, what is the biggest thing you want me to take away from this interview?

Great. Thank you again for your time and for sharing your opinions and stories with me. I enjoyed hearing about your family and _____ (preschool child).

Before we hang up, I want to make sure I have your current address so we can mail you a check for participating in this interview. [WRITE ADDRESS BELOW]

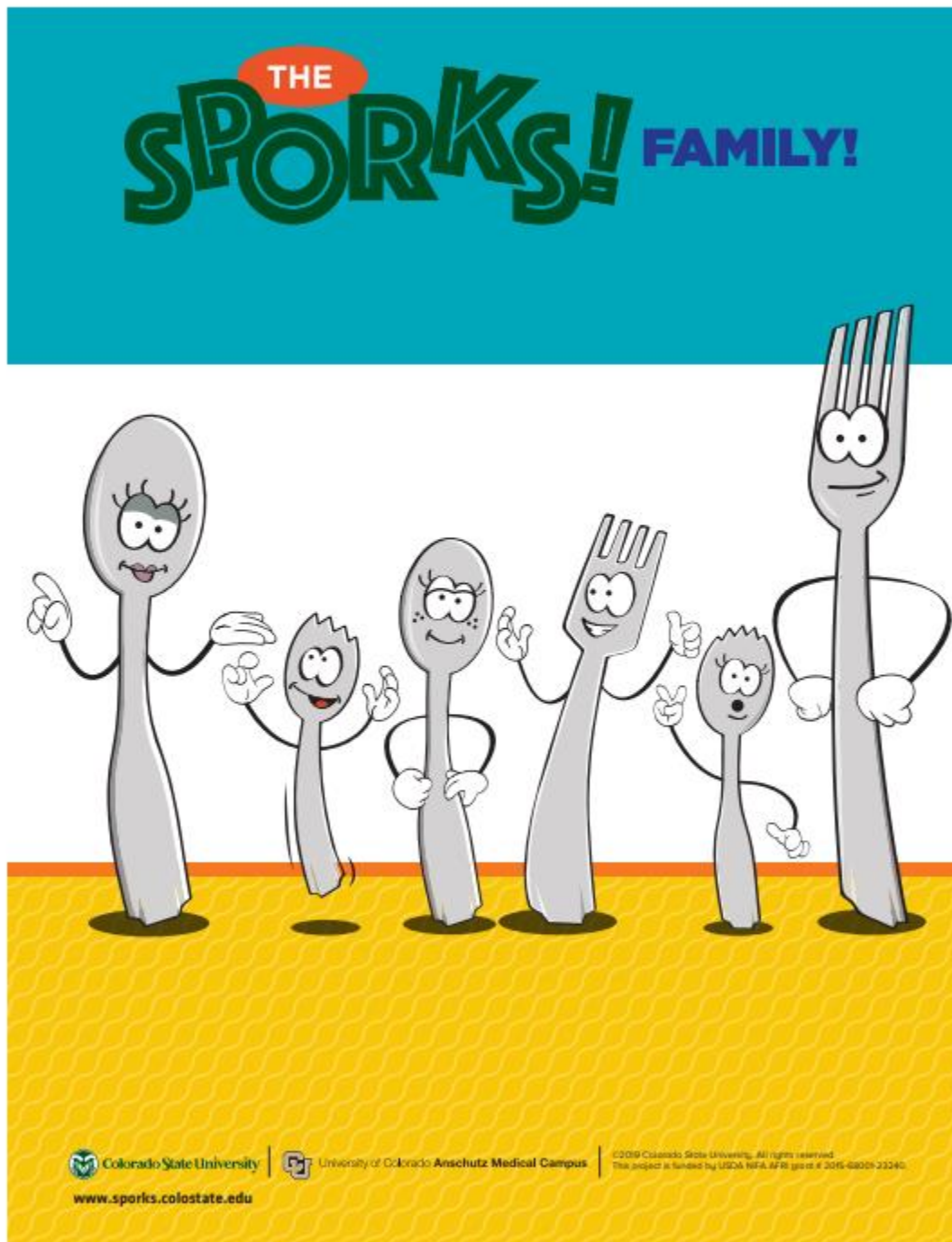
APPENDIX III: INTERVENTION MAPPING MATRIX

Intervention Components	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Health Fair								
General Topics	Health Fair	Workshop <i>Finding time to prioritize self-care and mindfulness</i>	Health coaching: Goal Setting <i>How can goal-setting be used in self-care and to spur healthful decisions</i>	Health coaching: Self-monitoring and Healthy Eating <i>Healthy Eating as Self-care</i>	Health coaching: Know your Reality and Physical Activity <i>How to incorporate physical activity in to daily routines</i>	Health coaching: Stress Management <i>How to identify feelings and emotions during stressful times and manage them</i>	Workshop 2 <i>Reflection on self-care</i>	Health Fair
Title								
Key areas to cover		Self-care for Health 1. Overview of the self, needs, and role of mother 2. What is self-care? How stress-management, physical activity, and healthy eating fit with self-care 3. Times that might be available to fit self-care in 4. Prioritizing self-care and how taking care of yourself relates to your family. 5. Mindfulness as self-care 6. Self-care tips 7. Hand back health fair results	Goal Setting and Self-Monitoring for Health Mindful breathing 1. Review from workshop and the WaLTTR for self-care 2. Address any questions about the health fair results 3. Introduce SMART Goals 4. Discuss what self-monitoring is and how can it help goal accomplishment 5. Set a goal for the coming week	Monitoring your Self-care Goal and Healthy Eating as Self-care Mindful breathing 1. Check-in on and reflect on weekly goal 2. How can healthy eating be self-care and how mindfulness plays a role in healthy eating 3. Healthy eating: what information the participant's health fair report card had 4. How self-monitoring can aid in achieving self-care goals 5. Set goal for the week and reflect on how it will be monitored 6. Introduce mindful eating journal and shopping list in eBinder	Setting Daily Self-care Goals and Physical Activity as Self-care Mindful breathing 1. Reflect on weekly activity and goal 2. Refer to health fair results for health (PA can help with these things) and Garmin activity information from the week 3. What is PA and how does it impact health 4. How to fit exercise in to short moments of free time 5. Set goals for the week	Self-care Goals that Become Habits and Stress Management as Self-care Mindful breathing 1. Reflect on weekly activity and goal 2. Reflect on Stress Levels from the week from the Garmin Activity tracker 3. Refer to stress management handouts and information what stress is, how it can impact health, and identifying stressful moments throughout the day 4. Discuss mindfulness and introduce different mindful practices (breathing, mindful walk, mindful body scan) 4. Set goals for the week 5. Introduce stress and stress management journal	Building a self-care plan Mindful breathing 1. Mindful body scan 2. Reflection on weekly coaching sessions and self-monitoring and on how/if their self-care practices have changed as well as barriers that still exist 3. Explain how to set a self-care plan and differences between emergency and maintenance self-care 4. In place of a self-care bracelet, what reminders might they have/set to remember their own self-care?	1. Collect key measures
Pre-weekly self-monitoring activity			WaLTTR for self-care	Review RFPM photography and health fair report card	Track activity with Garmin	Track stress level with Garmin	Reflection on weekly coaching sessions	
Objectives (Learning, Behavioral/Performance); SCT constructs		Mothers build knowledge of the importance of self-care and confidence in their ability to find or make opportunities to practice self-care	Mothers build knowledge in SMART goal setting and confidence in their ability to set goals relating to health and self-care	Mothers build knowledge of healthy eating practices and confidence in their ability to improve diet quality.	Mothers build knowledge of physical activity benefits and confidence in their ability to set goals and find moments of free time for physical activity	Mothers build knowledge of self-care and mindfulness strategies to manage perceived stress and confidence in using self-care techniques.	Mothers reflect on self-care practices, self-monitoring behaviors, and what tools are necessary moving forward.	
Reciprocal Determinism		<i>The overall program will address the relationship between personal factors of the mother (i.e. maternal health, stress-management, behavioral capability, and self-efficacy), target behaviors (self-care, stress-management, healthy eating, and PA), and environmental supports (i.e. Social support, informational support, and family context)</i>						
Behavioral Capability - Knowledge & Skills		Mothers will: 1) <u>Reflect</u> about the self and the role of mother/ other roles (Anchor) 2) <u>Gain knowledge</u> about self-care and benefits of self-care/ how to find times to incorporate it in daily routine (Add) 3) <u>Reflect</u> on their own stress management, healthy eating, and PA as self-care and how these relate to their child (Anchor/Apply) 4) <u>Identify</u> times they are most likely to be able to fit self-care in to their schedules (Away).	Mothers will: 1) <u>Reflect</u> how they have or have not incorporated self-care into their week. (Anchor) 2) <u>Gain knowledge</u> about how to set health goals (Add) 3) <u>Reflect</u> on their own health goals and how these relate to their stress management, healthy eating and PA (Apply) 4) <u>Set goals</u> for specific changes they desire to make for self-care (Away).	Mothers will: 1) <u>Express</u> how they have or have not met their overarching self-care goals for the week. (Anchor) 2) <u>Gain knowledge</u> about healthy eating (Add) 3) <u>Reflect</u> on their own health goals relating to healthy eating (Apply) 4) <u>Set or evaluate goals</u> for specific changes they desire to make for self-care (Away).	Mothers will: 1) <u>Express</u> how they have or have not met their mindful eating goals for the week. (Anchor) 2) <u>Gain knowledge</u> about fitting physical activity in to daily routines (Add) 3) <u>Reflect</u> on their own health goals relating to physical activity (Apply) 4) <u>Set goals or evaluate goals</u> for specific changes they desire to make for physical activity (Away).	Mothers will: 1) <u>Express</u> how they have or have not met their physical activity goals for the week. (Anchor) 2) <u>Gain knowledge</u> about causes of stress, stress management techniques, and mindfulness. (Add) 3) <u>Reflect</u> on their own stress-management and how parental stress affects family life (Apply) 4) <u>Set goals or evaluate goals</u> for specific changes they desire to make for stress-management (Away).	Mothers will: 1) <u>Reflect</u> on self-care practices and self-monitoring activities (Anchor) 2) <u>Identify</u> barriers that may still exist for self-care and share strategies to overcome and build a self-care plan (Add/Apply) 3) <u>Reflect</u> on their own stress-management, healthy eating, and PA and how these affect their own wellbeing (Apply) 4) <u>Set goals and a plan or evaluate goals</u> for moving forward with self-care (Away).	

Intervention Components	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
	Health Fair							
Self-Efficacy		Workshop Mothers build confidence in their ability to find or make opportunities to practice self-care.	Health coaching: Goal Setting Mothers will increase self-efficacy to apply goal setting for health strategies to areas they want to change relating to healthy eating, PA, and stress-management	Health coaching: Self-monitoring and Healthy Eating Mothers build confidence in their ability to eat healthfully and set goals relating to self-care	Health coaching: Know your Reality and Physical Activity Mothers build confidence in their ability to find time to incorporate physical activity into their daily routines and set goals relating to self-care	Health coaching: Stress Management Mothers build confidence in their ability to manage stress and set goals for self-care	Workshop 2 Mothers build confidence in their ability to overcome barriers to self-care and to fit in self-care and reflect on the importance of including it in daily life	Health Fair
Expectancies/Expectations (Attitudes)		Mothers will find self-care practices to be worthwhile and will gain an appreciation for (a) what they are currently doing for self-care, and (b) what changes could enhance their own self-care	Mothers will see goal setting as worthwhile and how it can be used to improve self-care and health	Mothers will see value for how healthy eating can be a form of self-care and can improve health	Mothers will gain an appreciation for how physical activity can be a form of self-care and can improve health	Mothers will gain an appreciation for how stress management can improve health and is a form of self-care.	Mothers will find self-care practices to be worthwhile	
Reinforcement		Website and handout resources will reinforce workshop concepts and will provide tools, resources, and examples of self-care	Website and handout resources will reinforce workshop concepts and will provide tools, resources, and examples of goal setting for health	Website and handout resources will reinforce workshop concepts and will provide tools, resources, and examples of healthy eating	Website and handout resources will reinforce workshop concepts and will provide tools, resources, and examples of physical activity	Website and handout resources will reinforce workshop concepts and will provide tools, resources, and examples of stress-management	Website and handout resources will reinforce workshop concepts and will provide tools, resources, and examples on how to set a plan for self-care.	
Activities		1. Ground rules 2. Red ball activity 3. Self-collage 4. Mom's hierarchy of needs ladder and ideal ladder 5. Mindful listening activity	1. Mindful breathing 2. Guided self-care goal setting using SMART goal framework	1. Mindful breathing 2. Review of RFPM photos and health fair results 3. Guided self-care goal setting using SMART goal framework and discussion of self-monitoring 4. Self-efficacy questions 5. Introduce eBinder resources	1. Mindful breathing 2. Review of health fair results and Garmin Activity tracker statistics related to PA 3. Guided self-care goal setting using SMART goal framework and discussion of self-monitoring 4. Self-efficacy questions	1. Mindful breathing 2. Review of Garmin Activity tracker statistics related to stress levels 3. Discussion on what stress is and how it impacts health as well as stress management and mindfulness/mindful activities 4. Guided self-care goal setting using SMART goal framework and discussion of self-monitoring 5. Self-efficacy questions 6. Introduce eBinder resources	1. Mindful breathing 2. Mindful body scan 3. Reflection on the program, self-care, and meeting with the health coach 4. Set a Self-care Plan	
Activities Purpose		<i>The purpose of the above activity is to:</i> 1. Establish a safe environment for sharing 2. "Break the ice" and create group cohesion as well as introduce the concept: "As a mom, you're always juggling many things." 3. Reflect on the self and the role of mom 4. Increase awareness of where time is spent and where time could be used for self-care as well as to talk about the difference between the reality of self-care and the ideal 5. Introduce the concept of mindfulness	<i>The purpose of the above activity is to:</i> 1. To bring the participant and coach to the meeting and practice mindfulness 2. Model and coach participant on setting SMART goals for self-care	<i>The purpose of the above activity is to:</i> 1. To bring the participant and coach to the meeting and practice mindfulness 2. Reflect on eating practices and identify with participant areas for change or growth 3. Model and coach participant on setting SMART goals for self-care 4. Assess participant self-efficacy after the session 5. Introduce mindful eating journal and electronic shopping list in eBinder	<i>The purpose of the above activity is to:</i> 1. To bring the participant and coach to the meeting and practice mindfulness 2. Reflect on PA and identify with participant areas for change or growth 3. Model and coach participant on setting SMART goals for self-care 4. Assess participant self-efficacy after the session	<i>The purpose of the above activity is to:</i> 1. To bring the participant and coach to the meeting and practice mindfulness 2. Reflect on stress levels and identify with participant patterns of stress and areas for change or growth 3. Introduce the health consequences of stress (why is it important to manage stress) and stress management techniques like mindfulness 4. Model and coach participant on setting SMART goals for self-care 5. Assess participant self-efficacy after the session 6. Introduce the stress tracker handout in the eBinder	<i>The purpose of the above activity is to:</i> 1. To bring the participant and coach to the meeting and practice mindfulness 2. To further practice mindfulness and provide an example of a mindful activity from the week before 3. Reflect on self-care and identify with participants patterns of barriers relating to their own self-care 4. Introduce the differences between maintenance and emergency self-care and how to set a self-care plan.	
Handouts		<u>1. Sporkshop Roadmap 2. Guiding Principles 3. Self-care for Busy Moms: Knowing Yourself 4. Self-collage 5. Hierarchy of Needs 6. Basics of Self-care 7. Mindfulness</u>	<u>1. SMART Goals</u>	<u>Healthy Eating as Self-care: Mindful Eating: Mindful Eating Journal; Grocery Shopping Worksheet</u>	<u>Physical Activity as Self-care: Tips to Be Physically Active on Busy Days</u>	<u>Stress and Stress Management; Mindfulness; Stress Tracker</u>	<u>Creating a Self-care Plan; The Self-care Plan</u>	

Intervention Components	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Health Fair		Workshop	Health coaching: Goal Setting	Health coaching: Self-monitoring and Healthy Eating	Health coaching: Know your Reality and Physical Activity	Health coaching: Stress Management	Workshop 2	Health Fair
Handouts Purpose		<p><i>The purpose of the above handout is to:</i> 1. Provide an overview of program components 2. Support the discussion of ground rules 3. Provide a framework for self-reflection 4. Provide a creative opportunity for self-reflection 5. To offer a structure to reflect on prioritization and timing of self-care 6. To provide information on self-care 7. To introduce the concept of mindfulness</p>	<p><i>The purpose of the above handout is to:</i> 1. Provide a structure and questions for reflection to set goals for self-care</p>	<p><i>The purpose of the above handout is to:</i> 1. Provide information about healthy eating as a form of self-care 2. Describe how mindfulness plays a role in healthy eating 3. Provide a structure for thinking and reflecting mindfully about eating 4. Provide a grocery shopping list as a resource</p>	<p><i>The purpose of the above handout is to:</i> 1. Provide information about physical activity as a form of self-care 2. Provide information on types of activity and how to fit it in to brief moments of free time throughout the day</p>	<p><i>The purpose of the above handout is to:</i> 1. Provide information about consequences of stress, importance of stress management, and types of stress management as a form of self-care 2. Provide information on types of mindfulness activities and how they act in stress management 3. Provide a stress tracking worksheet to be used in tandem with the Garmin Activity Track stress level information and keep notes on stress management techniques used</p>	<p><i>The purpose of the above handout is to:</i> 1. Provide information about how to create a self-care plan and the differences between maintenance and emergency self-care 2. Provide a worksheet and framework within which to build a self-care plan</p>	
WaLTTR		WaLTTR Self-care: The purpose of this WaLTTR was to provide a mindful structure for reflection throughout the week about topics discussed in the workshop, including finding time, prioritizing, and trying new forms of self-care	WaLTTR Goal Setting: The purpose of this WaLTTR was to provide a mindful structure for reflection throughout the week about setting goals for self-care	WaLTTR Health Eating: The purpose of this WaLTTR was to provide a mindful structure for reflection throughout the week about eating habits and behaviors.	WaLTTR Physical Activity: The purpose of this WaLTTR was to provide a mindful structure for reflection throughout the week about PA and behaviors.	WaLTTR Stress Management: The purpose of this WaLTTR was to provide a mindful structure for reflection throughout the week about stress and stress-management behaviors.		

APPENDIX IV: SAMPLE FROM THE HEROS SELF-CARE ELECTRONIC BINDER





Thank you for participating in the SPORKS Family program. Our goal is to promote healthful eating and physical literacy for preschoolers and their families.

If you have questions during the program, please reach out to:

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Sporkshop Roadmap





Guiding Principles of the Sporkshops

Four Guiding Principles of the Sporkshop

1. Finding ways to celebrate you as parents
2. Focusing on the things that are going well
3. Providing you with strategies to find time for self-care
4. Enjoying little moments with your family and friends

Sporkshop Ground Rules:

1. Not judging each other
2. Listening while others are sharing
3. Being on time for meetings with the group and health coach
4. _____
5. _____
6. _____
7. _____



What do you hope to get out of this program?

1. _____
2. _____



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Self-care for Busy Moms: Knowing Yourself

The Self

Who are you?

- ☐ What roles do you have?
- ☐ What types of things do you like or like to do?
- ☐ What characteristics make you who you are?
- ☐ Sometimes who we are changes when our roles change. Were there things you liked to do or liked about yourself before you had children? **Before Children:**
- ☐ What things do you like to do or like about yourself now that you have children? **Now:**
- ☐ What would you like to do or be in an ideal world? **Want to Be:**

Knowing yourself to practice self-care

Before we can know what really recharges us, it's important to reflect on who we are and areas where we need to take care of ourselves.

Who we are goes beyond the roles and jobs that we have and establishes us as unique and separate individuals.

With this knowledge, we can begin to make choices about how we want to take care of ourselves!

Self-care is important!

- Knowing what kinds of things make you feel refreshed and well-cared for is an important part of self-care.
- Keep a list of activities that you like to do that you can draw upon when things get stressful!



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Self-care for Busy Moms: Self-collage

Creating a self-collage

Having a visual representation of the things that make you who you are will guide our discussions about self-care in the coming weeks. Using your lists and reflections from the previous page, draw, color, use emojis, write, or create something that represents who you are.



Self-care for Busy Moms: Hierarchy of Needs



Demands on our time and needs

We all have needs and demands on our time that can sometimes feel like a lot to handle. Start by making a list of things that require your time on a daily basis.

Moms' hierarchy of needs

We all prioritize these things differently. Below, fill in the top of your ladder with tasks/jobs/people that are highest priority every day. Fill in the ladder base with the tasks/jobs/people that you prioritize last.



Here you prioritized the demands on your time, but how much time do you actually spend on each activity? To the right of the ladder, write about how much time you spend each day on that activity.

Needs Ladder Takeaway:

- Where do you and your own needs fall on this ladder?
- Did your own needs make it on the ladder of your day or do other things get prioritized before you?



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Self-care for Busy Moms: Hierarchy of Needs

Demands on our time and needs continued

On the last page, you prioritized the demands on your time and wrote about how much time you spent on each activity, but what would this look like in an ideal world? On this ladder, indicate what your ladder would look like in the best case scenario.





Self-care for Busy Moms: Basics of Self-care

What is self-care?

Self-care is any activity that we do to take care of our mental, professional, emotional, educational, or physical health. Self-care is about making small efforts to take care of ourselves every single day. It is also important to know what self-care isn't: selfish. Many people tend to think of self-care as selfish and that it means ignoring children, partners, or things that need to get done. This is not the case! Self-care can be energizing, and by giving ourselves a little time each day to recharge, we can actually have more to give those around us. Learning to eat well, reducing stress, and exercising regularly can keep us healthy!

Types of self-care

Healthy eating:

- Eating as a form of self-care includes fueling and nourishing our bodies with the nutrients that we need and with how much food we need.
 1. Avoid skipping meals and eat when your body feels hungry.
 2. Incorporate healthy foods that you love.



Physical Activity:

- Physical activity is about moving our bodies and doing the types of activities that we enjoy.
 1. Go for a walk, have a dance party, or chase your child around the house. Activity is a great way to keep stress off and feel good!
 2. Find activities that you enjoy—avoid forcing yourself to do activities that you do not enjoy or that are uncomfortable!



Stress-management

- Stress management is about dealing with our stress. Stress can be tough on our bodies and it is important to find ways to make healthy decisions even when things are busy or stressful.
 1. Know your triggers. Plan to work around these triggers or have a self-care plan if they are unavoidable.
 2. Mindfulness is a great way to manage stress. Think less about things in the past or worry less about things in the future. Be fully present in the moment.



Self-care for Busy Moms: Mindfulness

Life can get pretty busy and hectic. It can be the case that we make it all the way home from work or the grocery store without remembering the drive. Autopilot can happen. Being more mindful can help!

What is mindfulness?

Mindfulness is the process of breaking down that autopilot and paying attention to the present moment without judgment. It is recognizing the thoughts, feelings, and experiences in a particular moment and not assigning value to them. For example, instead of: I hate when I'm late, mindfulness encourages us to recognize the feelings associated with being late and then letting them pass.

Mindfulness and self-care

Mindfulness can be used for healthful eating, activity, and stress management:

- **Mindful eating:** is the practice of paying full attention to your food and meals. What are the tastes, textures, or flavors that come with the foods you are eating. How hungry or full do you feel throughout the meal?
- **Mindful activity:** is the practice of paying attention to the feelings and thoughts associated with physical activity.
- **Stress management:** Mindfulness can help manage stress and interrupt reactions to stressful things. It can help us appreciate our self-care efforts even more!

In what areas do you want to see mindfulness?

How can you use mindfulness to:

☐ Eat Healthy

☐ Be Active

☐ Manage Stress

Try incorporating mindfulness in to your self-care routine!

1. Mindfully eat a snack or meal—explore the tastes and textures of your food.
2. Take a mindful walk—explore the feelings of the wind, the sights of the snow, and the feeling of your feet on the ground.
3. Observe your breathing—even listening to our breathing can be mindful!
4. Listening to others—try listening to a friend without any distractions, focusing on being completely present



Takeaway: Mindfulness can improve self-care!








Try being aware of your surroundings, emotions, and feelings this week. In what ways can you use mindfulness to improve your self-care?





WaLTTR: Self-care

ID _____

		Ask Ideas related to today's workshop	Document What do you notice this week?
	Watch	Watch for how you spend your time and for judgment about trying to fit more time in for self-care. Write down where you notice spending time that might be used for self-care.	
	Listen	Listening to our bodies when trying a new form of self-care can help us know what it is we need. How will you listen this week for the types of self-care you need?	
	Talk	Talking about our self-care can hold us accountable and also bring in people to support us! Who might you tell about your efforts to prioritize your own self-care?	
	Try	Try to incorporate more opportunities for self-care this week. Remember to try to find times for self-care without judgment or anger toward the process.	
	Reflect	After trying to find the times for self-care, reflect on what went well. What needs adjusting?	



Self-care for Busy Moms: SMART Goals

Setting goals for health can seem like a difficult and challenging task. We all want to work on something, but what does that look like exactly and how do we know if we have been successful?

S.M.A.R.T Goals

S.M.A.R.T Goals are specific, measurable, attainable, realistic, and timely. This framework helps us mindfully set the best goals that we can set and know when we have met our goals for health.

Specific: Specific goals ensure that we know what we want to accomplish. Instead of “be healthier,” we might set a goal to include more vegetables in our diets or exercise during the week. It helps to know the what, when, why, and where of our goals.

What am I doing?

When am I doing it?

Where will I do it?

Why am I doing it?

Measurable: How do we know that we have met our goal? In order to mark success, we must have a way of knowing what success looks like. How can we measure our goal completion? Maybe we want to try one new vegetable this week or to be active an extra two times a week. If we can measure our goal, we have a better chance of tracking our goal and knowing if we have been successful.

How will I track my progress?



SMART Goals

Try setting SMART goals for your self-care and then track your progress!



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Self-care for Busy Moms: SMART Goals

S.M.A.R.T Goals Continued

Attainable: The purpose of a goal is to motivate, not to discourage. A goal is attainable if we have the right skills and tools to accomplish or achieve the goal. It might seem exciting to set huge goals, but if the goal is impossible or too hard, it may be discouraging. What am I doing?

☐ What resources do I need to accomplish my goal? (e.g. shoes, schedule, etc.)

☐ What steps do I need to take to accomplish this goal?

Realistic: Attainable and realistic go hand in hand. Is our goal a possibility? Is it relevant to our lives?

☐ Am I excited about my goal?

☐ Is my goal true to me and my body?

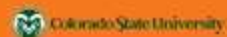
Timely: Goals for health should be time-bound. When do we expect this goal to be accomplished? The deadline for the goal should be realistic, as well. A short time frame can motivate and create a sense of urgency, but an unrealistic time frame can be demotivating. If a goal might take longer to accomplish, it can be helpful to set expectations for where we should be halfway through the timeframe.

☐ How long will this realistically take?

Notes:

SMART Goals

Try setting SMART goals for your self-care and then track your progress!



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WaLTTR: Goal Setting

ID _____

My self-care goal for the week is to: _____

		Ask Ideas related to today's session	Plan How will you achieve your goal this week?
	Watch	Watch your goal this week and see how it goes. What are some things you can do to approach your goal with an open mind?	
	Listen	Listen to your body when trying this goal. How will this goal affect your physical health? How do you feel before and after you try your goal?	
	Talk	Tell someone about your goal and get their feedback. What kinds of questions come up about your goal?	
	Try	Try implementing your goal without judgment. What do you notice?	
	Reflect	Reflect on your goal and the process. What went well? What needs adjusting?	



Self-care for Busy Moms: Healthy Eating as Self-care

Healthy eating and all that goes with it can seem difficult to incorporate into busy lives. The planning and preparation to fuel our bodies can seem like a lot of work, but healthy eating is a great form of self-care. What and how much we eat can impact how we feel and how ready we are to tackle life's challenges.

Healthy Eating

Self-care is about how we nurture ourselves. Healthy eating involves the way we nurture our bodies through what fuel and food we put in.

- A healthy diet is made up of a wide variety of different fruits, vegetables, grains, protein, and dairy!
- Finding a good balance of a variety of foods is important for health!
- Make half of your plate fruits and vegetables.
- Keep your protein serving small (about the size of a deck of cards).
- Make half your grains whole grains. Whole grains are great for gut health and keep you full longer.
- A healthy diet also includes a variety of colors-- try for a more colorful plate!

Food Group Recommended Servings

Food Group	Recommendation (per day)
Fruits	2 cups
Vegetables	2.5 cups
Grains (Whole Grains)	5 ounces (3 ounces)
Dairy	3 cups
Protein	5.5 ounces



MyPlate Resources

MyPlate offers ideas and tips to help you create a healthier eating style that meets your individual needs and improves your health. Check out **ChooseMyPlate.gov** for tips and tools like those listed below. Focus on a wide variety of foods, while choosing foods with less saturated fat, added sugars, and sodium.

Healthy Eating Tips!

1. Drink water! Replacing soda with water can cut back on added sugar.
2. Eat fewer saturated fats (found in processed and fast foods).
3. Try for a colorful plate to include more variety.
4. Have fruit or vegetables as an easy, healthy snack.



For more information, Use the Start Simple with MyPlate App!

- The iPad has the MyPlate App with information on each food group and MyPlate recommendations!
- You can also use this App to set goals to include fruits, vegetables, whole grains, dairy, and protein foods in to your diet!



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Self-care for Busy Moms: Mindful Eating

What is Mindful Eating?

Mindful eating is about paying full attention to the thoughts, feelings, tastes, textures, and smells associated with eating. Practicing mindful eating helps you reach a state of full awareness about our experiences with food, our cravings for certain foods, and even our hunger and fullness levels.

When we mindfully listen to our bodies, we acknowledge non-judgmentally how full or hungry we are. Eating mindfully is also about paying attention to the feelings we have while we are eating. Do we feel happy, angry, or guilty?

Mindful Eating Tips

Take the time to eat: Taking the time to eat is important for digestion and awareness of our fullness levels. When things get busy, skipping/forgetting meals all together can become a problem. Preparing food and taking the time to eat can help us reach our health goals and get the nutrients that we need so that we can feel better and get the energy we need to be successful in our day.

Eat slowly: Put your fork down between bites, chew your food well, and make each meal last at least 20 minutes. Notice the taste, texture, shape, and smell of your food. Savor it.

Limit distractions: Finding the time to focus on our meals is a challenge! Limiting distractions helps us focus on our food and on the experience of eating.



The Hunger and Fullness Scale

The Hunger and Fullness Scale helps us identify when our bodies need fuel. Staying between a 4 and 6 is the goal as it helps you avoid the discomfort of becoming overfull or too hungry.

The Hunger & Fullness Scale



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WaLTTR: Healthy Eating

ID _____

My self-care goal for the week is to: _____

		Ask Ideas related to today's session	Plan How will you achieve your goal this week?
	Watch	Watch for when you are eating. What do those moments look like? What are your reactions to these moments? What are some things you can do to approach your eating with an open mind?	
	Listen	Listen to your body. Where are you on the Hunger/Fullness Scale? Notice how the tastes, textures, and color of a food makes your body feel.	
	Talk	Who can you talk to about healthy eating? What questions does this bring up about healthy eating?	
	Try	Try implementing a new healthy eating goal. What do you notice?	
	Reflect	Reflect on the process of your healthy eating. What went well? What can you try differently next time?	

APPENDIX V: PDSA STAGE 2 AND 3 INFORMED CONSENT PACKETS

February, 2020

Dear _____:

Thank you for agreeing to be a part of our 8-week program for moms. It will be at the **Wray 55 & Over Club at 741 West 7th Street in Wray, CO 80758** at these dates and times:

- Wednesday, February 19th – Health Fair
- Wednesday, February 26th – Program
- _____ – Health Coaching Phone Call
- _____ – Health Coaching Phone Call
- _____ – Health Coaching Phone Call
- _____ – Health Coaching Phone Call
- Wednesday, April 1st – Program
- Wednesday, April 8th – Health Fair

Each night of the program, you and your preschooler will come to the Wray 55 & Over Club. We'll provide dinner for everyone and childcare for other children as well. Included in this packet are consent forms for you and your preschooler to participate in the project and a short survey.

PART 1: About the program:

This paper (white) will tell you more about what to expect on each night of the program. If you have any questions about the study, please do not hesitate to text or call us at 970-878-7154.

PART 2: Forms

1. **Consent forms:** please read and sign these forms so you can be in the study. There are three consent forms:
 - a. Consent Form A (GREEN) – this is for you completing the health measures that are part of the program
 - b. Consent Form B (PURPLE) – this is for your child having their height and weight taken in the program
 - c. Consent Form C (BLUE) – this is for your participation in the educational part of the program
2. **Survey (WHITE):** Please fill out this survey so we can learn a little more about you and your family.

Please complete these forms and **bring them with you on February 19th**. We will provide you with copies of all of the consent forms at that time.

We look forward to seeing you next week!

Sincerely,

Savannah Hobbs, M.Ed
Study Coordinator

Laura Bellows, PhD, MPH, RDN
Principal Investigator

PART 1: PROGRAM INFORMATION

We'll ask you to complete study activities 3 times as part of the program. Each time you complete these activities, you will get **\$100 (for a possible total of \$300)**. We'll ask you to complete these study activities:

- During the first week of the program (\$100)
- During the last week of the program (\$100)
- In Late Summer 2020 for follow-up (\$100)

Study Activities: Health Fair (GREEN CONSENT FORM)

Fingerstick (mom ONLY)

- We will ask you to wash your hands with soap under warm water. This will clean your hands and warm them up.
- We will have you sit down, and will clean two fingers with alcohol wipes.
- We will prick one finger to get out a few drops of blood. We will use these drops of blood to measure your cholesterol and blood sugar.



Blood Pressure (mom ONLY)



- We will measure your blood pressure with an automated device. You will need to sit quietly for 5 minutes before we take your blood pressure.

Dietary Assessment (mom ONLY)

- We will ask you to tell us about what you ate the day before.
- We will use a computer to record what you tell us.



Food Photography (mom and child)



- We will ask you to take photos of your dinner and your preschool child's dinner each night for one week using an iPad we give to you.

Physical Activity Assessment (mom and child)

- We will ask you and your preschool child to wear an accelerometer (an activity tracker) on your wrist for one week.



Height, Weight, and Waist size (mom and child)



- We will ask you to take off your shoes and any heavy clothing items.
- We will ask you to stand on a stadiometer to measure your height.
- We will ask you to stand on a scale to get your weight.



- We will put a soft fabric tape around your waist to get your waist size. You may need to lift your shirt up just enough for us to set the tape against your skin.

Hair Measure (mom ONLY)

- We will take just a small sample of your hair from the back of your head. This will be to measure cortisol levels.

Surveys (mom ONLY)

- We will ask you to fill out several surveys about your eating and activity, stress, your child's diet, as well as your home food and activity environment.

Six-Week Program for Moms and Preschoolers (BLUE CONSENT FORM)

- You and your preschooler will participate in a 6-week program.
- The first program night will be about self-care, and dinner and childcare will be provided.
- You will also meet once a week for 4 weeks with a health coach over the phone.
- There will then be a final workshop at the end to wrap up the program.



PART 2: FORMS

CONSENT FORMS

There are 3 consent forms:

- Consent Form A: for completing health measures at health fair (parent; GREEN)
- Consent Form B: for child completing assessments (child; PURPLE)
- Consent Form C: for participating in the program (parent; BLUE)

This form tells you about the program. You must sign and bring it with you to be in the study. It is our permission form for you to be in the study.

It is important that you read all three consents.

Once you have read them:

- Initial and date the bottom of each page (highlighted)
- Sign and date the last page (where it says participant signature, this is highlighted also).
- We will give you a copy of each form to keep for your records.

SURVEY

- There is one survey (white) that we'd like you to fill out to tell us a little bit more about you and your family

Please put the signed consent forms and completed survey back in the envelope and bring them with you on February 19th.

COLORADO STATE UNIVERSITY
INFORMED CONSENT TO PARTICIPATE IN A RESEARCH PROJECT
Form A – Parent Consent to Complete Health Measures

TITLE OF PROJECT: The home food environment in families with preschoolers: Linking home food availability with parent nutritional health and chronic disease risk.

NAME OF PRINCIPAL INVESTIGATOR: Laura Bellows, PhD, MPH, RDN

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS: Laura Bellows, 970-491-1305

SPONSOR OF PROJECT: USDA Agriculture and Food Research Initiative (AFRI)

The purpose of this study is to find out how mothers' health, the home food environment, and child growth relate to each other. You will be asked to attend an in-person appointment where you will fill out a few surveys and study staff will take several measures of your health. The appointment will take place at the Wray 55 & Up Club.

You will be asked to complete surveys at this time related to your home food and activity environment, your physical activity, and information about your family. Study staff will take the following health-related measurements:

1. Lab tests: The study staff will collect 3-4 drops of blood from one of your fingertips to find out what your cholesterol and blood sugar levels are.
2. Blood Pressure and Pulse: The study staff member take your blood pressure and pulse using an automated blood pressure monitor.
3. Height: The study staff will measure your height. You will be asked to remove your shoes before the measurement.
4. Weight: The study staff will measure your weight. You will be asked to remove your shoes and any heavy clothing before the measurement.
5. Waist Circumference: The study staff will measure your waist size by placing a soft fabric tape measure around your waist even with your belly button. You will be asked to lift your shirt only as high as needed to set the tape measure against the skin in line with the belly button.
6. Dietary Assessment: You will tell us about what you ate in the last 24-hours using a computer. A study staff member will be available if you have any questions or would like help using the computer. We expect this to take 30-45 minutes.

You will be asked to complete these measures on 3 occasions over a 1 year period. Each participant will receive a total of \$50 at the end of the in-person visit for up to \$150.

Your name will not be used in any way. All data will be kept in a locked cabinet or password-protected computer at Colorado State University in the Department of Food Science and Human Nutrition. Your identity/ record of receiving compensation (NOT your data) may be made available for an audit by CSU officials for financial audits.

There are no known risks to completing the surveys. Some participants may feel uncomfortable during the individual physical measurements, during the finger-stick procedures, or at the sight of blood. The finger-prick procedure may cause momentary discomfort to some participants. Our study staff are trained to deal with this discomfort. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

A potential benefit of participating in the study will be that, at the end of the study, you will receive a health "report card", which will list out the results of your measurements taken during the in-person visit. This report will not diagnose any health issues, rather it will tell you what we measured and what the scores were. We encourage you to share this health report to your normal health care provider when you next see them.

Page 1 of 2 **Parent's Initials** _____ **Date** _____

All information provided by you will be fully confidential and used for research purposes only. Your information will be assigned a number instead of using your name. The only exceptions to this are if we are asked to share the research files for audit purposes with the CSU Institutional Review Board ethics committee, if necessary. For funded studies, the CSU financial management team may also request an audit of research expenditures. For financial audits, only the fact that you participated would be shared, not any research data. The law may require us to show your information to a court OR to tell authorities if we believe you have abused a child, or you pose a danger to yourself or someone else.

The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

If you agree to take part in this study, it is your choice. You may stop your participation at any time without penalty or loss of benefits.

Your signature means that you have read and understand this consent form, you have willingly signed it, and you have received a copy of this form. If you have any questions about your rights as a volunteer in this research, *contact the IRB Coordinator at:* the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

Adult Participant's name (printed)

Phone Number

Adult Participant's signature

Investigator or co-investigator's signature

Date

Page 1 of 2
COLORADO STATE UNIVERSITY
INFORMED CONSENT TO PARTICIPATE IN A RESEARCH PROJECT
Mindful Self-Care Program - Child

TITLE OF PROJECT: *Bridging Home and Preschool Environments to Promote Healthy Eating and Activity Behaviors and Prevent Obesity in Early Childhood*

NAME OF PRINCIPAL INVESTIGATOR: Laura Bellows, PhD, MPH, RD

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS: Laura Bellows, 970-491-1305

SPONSOR OF PROJECT: USDA Agriculture and Food Research Initiative (AFRI)

The purpose of this study is to understand the impact of a 6-week family program aimed at providing families with young children with strategies to eat healthfully, manage stress, and be physically active. This study consists of 2 parts: 1) the parent program (Mindful Self-Care) which will provide parents with strategies to help prioritize their own healthy eating, physical activity, and stress management practices; 2) study activities to help us learn more about your family's eating and physical activity behaviors.

Part 1: Mindful Self-Care Program

You and your preschool child will be asked to participate in 2 evening sessions (2 hours each) with other parents and preschoolers, at your child's preschool or another convenient community location. Dinner will be provided and you will eat together with your preschool child. After dinner, parents will participate in a session about self-care and how it relates to health and wellness, and childcare will be provided.

Part 2: Study activities

We would like your child, if he or she wants to, to be a part of this study, as well. The second part of this study involves 3 additional evening sessions at your child's preschool or another convenient community location. Dinner and childcare will be provided each evening.

We expect the entire evening session to take about 2 hours. After eating dinner, your child will be asked to complete the following:

- Height, weight and waist circumference: your child will be asked to remove his/her shoes before measuring height and weight. For waist circumference, the study staff will measure your child's waist size by placing a soft fabric tape measure around his/her waist even with your belly button. Your child will be asked to lift his/her shirt only as high as needed to set the tape measure against the skin in line with the belly button.
- Physical activity levels – this will be measured by having your child wear an accelerometer (a device that measures physical activity levels, and is similar to popular activity trackers like Fitbit, etc.) on their non-dominant wrist for 7 days to find out how active your child is on a daily basis.

We will ask your child to complete these three times: before your family participates in the 6-week program, after your family participates in the program, and once more as a follow-up about 4 months later.

Your child's name will not be used in any way. All assessment recording sheets will be kept in a locked cabinet or password-protected computer at Colorado State University in the Department of Food Science and Human Nutrition.

There are no known risks of this study. Some children may feel nervous in the presence of new people, but our study staff will be trained to ease these feelings. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

Potential benefits of participating in the study will be that children and parents become more aware of the activities and foods that children enjoy. We think that eating healthy and enjoying physical activity as a family may benefit the development of healthful habits in young children will lead to healthy lifestyles throughout life.

Page 1 of 2 Parent's Initials _____ Date _____

All information provided by you will be fully confidential and used for research purposes only. All information collected as part of the research, even if identifiers are removed, will not be used or distributed for future research studies. Your child's information will be assigned a number instead of using their name. The only exceptions to this are if we are asked to share the research files for audit purposes with the CSU Institutional Review Board ethics committee, if necessary. For funded studies, the CSU financial management team may also request an audit of research expenditures. For financial audits, only the fact that your child participated would be shared, not any research data. The law may require us to show your information to a court OR to tell authorities if we believe you have abused a child, or you pose a danger to yourself or someone else.

The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

If you allow your child take part in this study, it is your choice. You may stop your child's participation at any time without penalty or loss of benefits.

Your signature means that you have read and understand this consent form, you have willingly signed it, and you have received a copy of this form. If you have any questions about your child's rights as a volunteer in this research, *contact the IRB Coordinator at:* the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

Child's name (printed)

Child's birthdate

Gender: _____Male _____Female

Investigator or co-investigator's signature

Date

PARENTAL SIGNATURE FOR MINOR

As parent or guardian you authorize _____ (print name) to become a participant for the described research. The nature and general purpose of the project have been satisfactorily explained to you by _____ and you are satisfied that proper precautions will be observed.

Parent/Guardian name (printed)

Parent/Guardian signature

Date

Phone Number

Email

Additional Information

1. Does your child have any food allergies? Yes No

a. If so, please list: _____

Page 1 of 2
COLORADO STATE UNIVERSITY
INFORMED CONSENT TO PARTICIPATE IN A RESEARCH PROJECT
Mindful Self-Care Program – Parents

TITLE OF PROJECT: *Bridging Home and Preschool Environments to Promote Healthy Eating and Activity Behaviors and Prevent Obesity in Early Childhood*

NAME OF PRINCIPAL INVESTIGATOR: Laura Bellows, PhD, MPH, RD

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS: Laura Bellows, 970-491-1305

SPONSOR OF PROJECT: USDA Agriculture and Food Research Initiative (AFRI)

The purpose of this study is to understand the impact of a 6-week family program aimed at providing families with young children with strategies to eat healthfully, manage stress, and be physically active. This study consists of 2 parts: 1) the parent program (Mindful Self-Care) which will provide parents with strategies to help prioritize their own healthy eating, physical activity, and stress management practices; 2) study activities to help us learn more about your family's eating and physical activity behaviors.

Part 1: Mindful Self-Care Program

You and your preschool child will be asked to participate in 2 evening sessions (2 hours each) with other parents and preschoolers, at your child's preschool or another convenient community location. Dinner will be provided and you will eat together with your preschool child. After dinner, parents will participate in a session about self-care and how it relates to health and wellness, and childcare will be provided. There will also be four 30-min health coaching sessions that will take place electronically. As part of the program, an iPad and activity tracker will be provided to each family and if you attend 5 out of 6 program sessions/health coaching sessions, your family will get to keep the iPad and activity tracker once the program ends.

Part 2: Study activities

The second part of this study involves 3 additional evening sessions at your child's preschool or another convenient community location, as well as some things we will ask you to do at home. Dinner and childcare will be provided each evening.

In-person: We expect the entire evening session to take about 2 hours. After eating dinner, you will be asked to complete the following:

- Packet of surveys related to your family's demographics, your child's eating and physical activity behaviors, your own self-care practices related to eating and activity, stress, and your child's diet.
- Height, weight and waist circumference: you will be asked to remove your shoes before measuring height and weight. For waist circumference, the study staff will measure your waist size by placing a soft fabric tape measure around your waist even with your belly button. You will be asked to lift your shirt only as high as needed to set the tape measure against the skin in line with the belly button.

At-home: You will be provided with instructions and necessary materials to complete these at home in the week that follows the evening session:

- Dietary assessment: you will tell us about what you ate in the last 24-hours over the phone. This will happen twice (once on a weekday and once on a weekend) and will be scheduled at a time that is convenient for you. We expect this to take about 30 minutes each time.
- Taking pictures of you and your child's dinner food: you will be asked to use the provided iPad to take photos of your dinner and your child's dinner each night for 7 days. We expect this to take 5-10 minutes each evening.
- Physical activity level: you will be asked to wear an accelerometer (a device that measures physical activity levels, and is similar to popular activity trackers like Fitbit, etc) on your non-dominant wrist for 7 days, including sleeping.
- Home environment: you will be asked to complete a survey that involves looking through your home for food items, physical activity items and electronic items. We expect this to take about 30 minutes.
- Texted questions: you will be asked to respond to questions texted to your phone or iPad two times a day for two weeks. These questions will ask about your present moment and mindfulness.

We will ask you to complete all of these study activities three times: before you participate in the 6-week program, after you participate in the program, and once more as a follow-up about 4 months later. At each time point, compensation of \$50 for your time will be provided.

Page 1 of 2 Parent's Initials _____ Date _____

Your name will not be used in any way. All data will be kept in a locked cabinet or password-protected computer at Colorado State University in the Department of Food Science and Human Nutrition. Your identity/ record of receiving compensation (NOT your data) may be made available for an audit by CSU officials for financial audits.

There are no known risks of this study. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

A potential benefit of participating in the study is that you will learn strategies for helping yourself to practice self-care and family to eat healthy and be physically active. We think that eating healthy and enjoying physical activity as a family may benefit the development of healthful habits in young children that will lead to healthy lifestyles throughout life.

All information provided by you will be fully confidential and used for research purposes only. All information collected as part of the research, even if identifiers are removed, will not be used or distributed for future research studies. Your information will be assigned a number instead of using your name. The only exceptions to this are if we are asked to share the research files for audit purposes with the CSU Institutional Review Board ethics committee, if necessary. For funded studies, the CSU financial management team may also request an audit of research expenditures. For financial audits, only the fact that you participated would be shared, not any research data. The law may require us to show your information to a court OR to tell authorities if we believe you have abused a child, or you pose a danger to yourself or someone else.

The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

If you agree to take part in this study, it is your choice. You may stop your participation at any time without penalty or loss of benefits.

Your signature means that you have read and understand this consent form, you have willingly signed it, and you have received a copy of this form. If you have any questions about your rights as a volunteer in this research, *contact the IRB Coordinator at:* the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

Adult Participant's name (printed)

Phone Number

Adult Participant's signature

Investigator or co-investigator's signature

Date

Page 2 of 2



Colorado State University's HEROs Study invites you to participate in our research project!

**Ever feel like you're running on empty? Curious how self-care
can help with health and wellbeing? We would like you to be
a part of our research on moms' self-care practices!**



The study will consist of 1 visit (1.5-2 hours) and one phone call (45 min-1 hour) with a health coach on a wellness topic of your choice. This will include:

- One self-care workshop on topics of healthy eating, physical activity, and mindfulness and a group discussion on how the workshop went.
- Health coaching on a topic of your choice: healthy eating, physical activity, or stress management techniques.

The self-care workshop will be at a central location at a time that works for you. The health coaching session will take place over the phone. Receive \$20 for the workshop and \$20 for the coaching session, up to \$40!

We are happy to answer any questions you have about the study:

- Savannah Hobbs (Study Coordinator), savannah.hobbs@colostate.edu or 970.491.2641
- Laura Bellows (Study Director, PI), Laura.Bellows@colostate.edu or 970.491.1305

APPENDIX VII: STAGE 2 GROUP DISCUSSION AND INDIVIDUAL INTERVIEW GUIDES TO INFORM PDSA CYCLES

Objective: (A) To revise and refine specific strategies for workshop content delivery and (B) to confirm the tools, resources, and skills parents of preschool-aged children need in a self-care intervention in order to enhance healthy eating, physical activity, and stress-management.

Group Discussion

Section I: Intervention Content

We are developing a self-care component for moms of preschoolers. What was presented today is one piece of that program. We would now like to ask some questions related to the workshop. We would appreciate your honest impressions – the good and the not so good. Your input is really valuable to us.

<ol style="list-style-type: none">1. Before today, how much have you thought about self-care?<ol style="list-style-type: none">a. Prompt: Were there things you knew or wanted to know more about? Behavioral Capability2. Let's talk about the workshop specifically. Overall, what did you think of the workshop?<ol style="list-style-type: none">a. What parts were enjoyable or insightful? (or would you like more of)?b. What parts were less enjoyable or insightful? (or would you like less of)?c. Prompts on activities:<ol style="list-style-type: none">i. Red ball activity?ii. Self-collage?iii. Hierarchy of Needs Ladder?iv. Mindfulness activity?3. What were your overall thoughts on the content and flow of this workshop?<ol style="list-style-type: none">a. Have you done mindfulness activities before the workshop? If so, what?b. What are your thoughts on some of the mindfulness activities (examples) that we did today?	
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<p>4. Would this opportunity to talk with other moms of preschoolers in a workshop help you with your self-care? If so, how? Social Support</p> <p>5. What were your thoughts about the resources we provided during the workshop?</p> <ul style="list-style-type: none"> a. What were your thoughts about having the eBinder on the iPad? How comfortable were you in using the stylus, etc. b. Did you like going through the handouts during the workshop? c. Would you have preferred to get them ahead of time? d. How about the number of handouts? Too many? Just Right? Want more? e. What did you think about having the handouts on the iPad versus in paper? f. One activity that we presented to prompt you to be more mindful is the WaLTTR framework. How do you think this might help you be more mindful in your daily life (if at all)? g. To follow up on that, <ul style="list-style-type: none"> i. Is this framework something you might use? ii. If not, what are some of the reasons that you would not? <p>6. Will this workshop help you with the knowledge or skills needed to practice self-care? Behavioral Capability</p> <p>7. What was it that attracted you to this workshop? Outcome Expectancies</p> <ul style="list-style-type: none"> a. What expectations did you have for this workshop? b. Were these expectations met with this workshop? 	
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Objective: (A) To revise and refine specific strategies for health coaching content delivery and (B) to confirm the tools, resources, and skills parents of preschool-aged children need in a self-care intervention in order to enhance goal setting and self-monitoring for healthy eating, stress management, and physical activity.

Brief Interviews

Section II: Health Coaching Content

Ok, well I now have a few questions about the session we just did. Again, we really appreciated your participation in this workshop and health coaching! As we mentioned in the workshop, we are working to develop a self-care program for moms and the coaching sessions are just one piece of the program. I'm going to ask you questions now about this session. We would appreciate your honest impressions – the good and the not so good. Your input is really valuable to us.

<p>1. Thanks for coming to the workshop last week/other day. Before we jump into talking about the coaching session. I wanted to revisit the workshop and see if there was anything else that you had thought of or wanted to share with me.</p> <ul style="list-style-type: none"> a. What takeaways did you have (if any) from the workshop last week? a. Did you use the WaLTTR to help plan or take note of any time for self-care? b. How confident are you in finding time to practice self-care? Self-efficacy <p>Great, thanks for sharing.</p>	
<p>2. Leading up to this session, what were some of the thoughts/feelings you had?</p> <p>Outcome Expectancies</p> <ul style="list-style-type: none"> a. Prompt: Excited, nervous/anxious, didn't think about it? 	
<p>3. Overall, what did you think of the session?</p> <ul style="list-style-type: none"> a. Parts that you enjoyed or found insightful? (or would like more of)? b. Parts that were less enjoyable or insightful? (or would like less of)? c. Prompt: Would you prefer phone call or was Zoom, ok? (Face to face versus phone call). d. Prompts on activities: <ul style="list-style-type: none"> i. Reflecting on own areas for goal-setting ii. Setting a goal e. Will this session help you with the knowledge or skills needed to set health goals? Behavioral Capability f. After this session, how confident are you in your ability to set health goals? Self-efficacy 	

4. What was one thing that you will walk away with?	
5. Would this opportunity to talk with a health coach help you with your self-care? If so, how? Social Support	
6. What are your thoughts about the term 'health coaching' for these sessions? a. Is there another term?	
7. I also am curious to hear your thoughts about the handouts. a. Did you look at the handouts at all after the workshop? b. How about the number of handouts for this session? Too many? Just Right? Want more? c. What did you think about having the handouts on paper versus on the iPad?	
8. After having attended one of these workshops and health coaching sessions, would you be interested in attending the full program? Outcome Expectancies b. Prompt: why/why not c. If so, how many sessions would you be interested in/willing to come to?	
9. As I've mentioned, we are developing a self-care component for moms of preschoolers. Our format that we are proposing is to do a workshop (like you experienced), followed by 4 coaching sessions, then a final workshop – for a total of 6 weeks. Each workshop will be 90 minutes and coaching sessions will be 30 minutes. The main topics of self-care would be on goal setting, healthy eating, and physical activity. a. Prompt: What are your initial reactions and thoughts to this format? b. Prompt: What would the feasibility of participating if childcare and dinner were provided for the workshop nights? c. Prompt: Would you be interested in something like this? Outcome-expectancy	

<p>10. In addition to the workshop and coaching session, what types of information/resources would be most helpful to match some of these topics that we touched on today?</p> <p>a. Prompt: What on a website with written materials, suggestions for apps, videos, or other resources would be helpful?</p> <p>i. Are there any other resources or information that might be helpful to receive in a program with regard to the topics we just talked about? Behavioral Capability</p> <p>ii. We plan to provide materials like an activity tracker and resistance bands to use with a coach. What are your thoughts on these materials?</p> <p>iii. Are there other materials that we should provide?</p>	
<p>11. Anything else that you would like to share with us about the workshop and health coaching? Either good or bad?</p>	

Conclusion:

(If there is confusing or conflicting information, summarize what you heard and revisit their answers.) That's it. We are all done with my questions and the session. Is there anything else that you would like to share with me? Any questions you may have? Thinking back through everything we've talked about, what is the biggest thing you want me to take away from this interview?

Great. Thank you again for your time and for sharing your opinions and stories with me.

Before we hang up, I want to make sure I have your current address so we can mail you a check for participating in this interview.
[WRITE ADDRESS BELOW]

Great. We'll send you payment and a summary of a few things that we heard from you during this interview. If you think of anything else that you would like to include, or if there is anything that you feel that we didn't capture accurately, please feel free to reach out to us.

APPENDIX VIII: STAGE 3 HEROS SELF-CARE PILOT TEST RECRUITMENT FLYER
AND INTEREST FORM

Calling All Moms!

Ever feel like you're running on empty?

Need some extra time in the day to take care of yourself?

Curious how self-care can help with health and well-being?



Join us for a 6-week research project and family program for parents and preschoolers!

What: Each week, parents will learn strategies to help prioritize their own self-care and will talk with a health coach one-on-one to discuss health goals. You and your preschooler will also participate in study activities to help us understand your family's eating and activity habits at home.

When/Where: 2 evenings (2 hours each, including provided dinner and childcare) at a location in your community + 4 personalized health coaching calls + study activities (3 times during the year)

Receive up to **\$300, an iPad, and an activity tracker** for your participation.

If you are interested, please fill out the attached interest form, return the form to your child's school by **January 31, 2020** or fill it out online at hbl.colostate.edu (**click current studies and opportunities in Eastern Colorado**) and we will get in touch with you.

TITLE OF PROJECT: *Bridging Home and Preschool Environments to Promote Healthy Eating and Activity Behaviors and Prevent Obesity in Early Childhood*

NAME OF PRINCIPAL INVESTIGATOR: Laura Bellows, PhD, MPH, RD

CONTACT NAME AND INFORMATION FOR QUESTIONS/PROBLEMS:

Laura Bellows, 970-491-1305 or laura.bellows@colostate.edu

SPONSOR OF PROJECT: USDA Agriculture and Food Research Initiative (AFRI)

Study Summary

Researchers at Colorado State University have developed an interactive, technology-based family educational program aimed at providing families with young children with strategies to eat healthfully and be physically active. This program will provide parents with strategies to practice their own self-care in the face of busy schedules and the demands of parenting. The study has two parts:

Family workshops and health coaching:

- The program will be 6 weeks long, with two 2-hour evening sessions at a convenient community location and four 30-minute health coaching sessions.
- Dinner will be provided and families will eat together during the two in-person sessions
- After dinner, preschool children will do fun activities, while parents will participate in a workshop about taking care of oneself as a busy parent
- Both you and your preschool child must participate in the program together
- If needed, childcare will be provided for other children who are not a part of the study

Study activities:

- We are also interested in learning more about your family's eating and physical activity behaviors
- Three times throughout the school year, you and your preschool child will attend an additional in-person appointment where you will be asked to participate in a health fair (including health measures such as blood pressure, cholesterol, height/weight), complete a packet of surveys, as well as some at-home activities over the week, such as wearing an activity monitor for 7 days.
- You will receive \$100 each time you complete all of the in-person and at-home activities; up to \$300 over the year, as well as an iPad and activity tracker for attending the workshops and health coaching sessions.

If you are interested in participating or learning more, please return the attached interest form to your child's teacher or fill out the interest form at hbl.colostate.edu (**click current studies and opportunities in Eastern Colorado**).

Confidentiality

Your name will not be used in any way. All information will be kept in a locked cabinet at Colorado State University in the Department of Food Science and Human Nutrition. All information provided by you will be fully confidential and used for research purposes only. Your information will be assigned a number instead of using your name.

Questions

If you have any questions about the study, please do not hesitate to contact Morgan McCloskey at 970-491-2641 or mlm@colostate.edu or Laura Bellows at 970-491-1305 or laura.bellows@colostate.edu. If you have any questions about your rights as a volunteer in this research, contact the CSU IRB at: RICRO_IRB@mail.colostate.edu; 970-491-1553.

Please keep this for your records.

Interest Form – Wray

Please return this form in the provided envelope to the front desk.

We have a few questions related to the project; your answers will not impact your eligibility to participate.

1. Please print your name: _____
2. Please print your child's name: _____
3. What is your child's sex? _____
4. What is your child's date of birth? _____
5. Please provide a phone number (please circle if it is a home/landline, cell phone or work phone number) and e-mail address so we can contact you with more information:
Phone number: _____ Home/landline Cell phone Work phone
E-mail address: _____
6. Please tell us what is the best way to contact you:
☐ Phone call ☐ Text message ☐ E-mail
7. Please tell us what is the best time to contact you:
☐ Morning (9am-12pm) ☐ Afternoon (12-5pm) ☐ Evening (5-8pm)
8. How do you access the internet? Please check all that apply:
☐ Data plan on smartphone
☐ WiFi at my home
☐ WiFi at work
☐ WiFi at other community location
9. Would you be willing to communicate with us via text message during the project?
☐ Yes
☐ Yes, but I have a limited number of texts that I can send/receive
☐ No
10. Could you and your preschool child attend the in-person evening workshops if they were held at a community location from 5:30-7:30pm on: (please check all that apply):
☐ Monday
☐ Tuesday
☐ Wednesday
☐ Thursday

(Your Signature)

(Date)

APPENDIX IX: STAGE 3 HEROS SELF-CARE POST INTERVENTION INTERVIEW
GUIDE

Objective: (A) To gain participant thoughts, feelings, and general feedback on a self-care intervention to inform program revisions; (B) to confirm the content, delivery methods, and digital strategies that parents of preschool-aged children prefer in a self-care intervention in order to enhance healthy eating, physical activity, and stress-management, and (C) to refine strategies for online implementation.

I have a few questions about the self-care program that you participated in. Your participation in the workshops and health coaching sessions was greatly appreciated and we would appreciate your feedback on how the program went for you, what you liked about it, and how we might improve it. This conversation should take around 45 minutes. We would appreciate your honest impressions – the good and the not so good. Your input is really valuable to us.

1. Before this program, how much had you thought about self-care?
 - a. Prompt: Were there things you knew or wanted to know more about? **Behavioral Capability**
2. After participating in this program, how confident do you feel in being able to practice self-care today? **Self-efficacy**
 - a. Prompt: How confident do you feel in being able to practice PA as self-care?
 - b. Prompt: How confident do you feel in being able to practice HE as self-care?
 - c. Prompt: How confident do you feel in being able to practice stress management as self-care?
3. What was it that initially attracted you to this program? **Outcome Expectancies**
 - a. Prompt: What expectations did you have for this program?
 - b. Prompt: To what extent were these expectations met with this program? Fully? Partially? Not at all?
4. I want to ask about individual components of the program. First, what are your thoughts on the health fair we did at the very beginning? That was when we had you come in for a finger prick, hair sample, and a food recall.
 - a. Prompt: What was it like getting your results?
 - b. Prompt: How helpful was this information?
 - c. Prompt: What have you done with this information?

5. Let's talk about the workshops specifically now. We'll start with our first workshop which was in-person at the Wray 55 & Up Club.. Overall, what did you think of this first workshop? **Delivery**
 - a. Prompts on activities: **Content**
 - i. Red ball activity? That was where we played the game with the group and the imaginary balls to talk about all of the things we were juggling.
 - ii. Hierarchy of Needs Ladder? This was in our eBinder and we talked about where we ourselves and our needs fell on the list of things that needed to get done in a day.
 - iii. Mindful listening? This was a mindfulness activity that we practiced bringing our awareness to our hearing. This introduced mindfulness.
 - b. Prompt: Was the length in time about right? **Delivery**
 - c. Prompt: What parts were enjoyable or insightful? (or would you like more of)? **Content**
 - d. Prompt: What parts were less enjoyable or insightful? (or would you like less of)? **Content**
6. Our second workshop was over Zoom/video call. Overall, what did you think of this second workshop? **Delivery**
 - a. Prompt: What parts were enjoyable or insightful? (or would you like more of)? **Content**
 - b. Prompt: What parts were less enjoyable or insightful? (or would you like less of)? **Content**
 - c. Prompts on activities: **Content**
 - i. Mindful body scan?
 - ii. Self-care plan?
 - d. Prompt: Was the length in time about right? **Delivery**
 - e. Prompt: What did you think of doing this over Zoom? **Delivery**
7. I'm interested on hearing your thoughts about the mindfulness activities that we did. Just a reminder that we had the mindful listening at the first workshop, mindful breathing at the beginning of each coaching session, and the body scan at the start of the second workshop. What are your thoughts on the Mindfulness activities? **Content**
 - a. Prompt: Have you/will you use any of these mindfulness activities outside of the program and on your own? **Content**
 - b. Prompt: How do or don't these activities help with feelings of stress? **Content**
 - c. Prompt: What had you heard of mindfulness before the program?

8. Overall, what did you think of the health coaching sessions? **Delivery**
 - g. Prompt: Parts that you enjoyed or found insightful? (or would like more of)?
Content
 - h. Prompt: Parts that were less enjoyable or insightful? (or would like less of)?
Content
 - i. Prompt: What did you think about the activities that you did to prepare each week for the coaching session call? **Content**
 - iii. On a scale from 1-5 (with 5 being “a great deal”, 4 being “Much”, 3 being “Somewhat”, 2 being “Little”, 1 being “never”), to what extent did you do the following to prepare for each coaching session call?
 1. Reflecting on own areas for goal-setting
 2. Reviewing results from health fair
 3. Healthy eating—tracking food photos
 4. PA—using the Garmin activity tracker
 5. Stress management—worksheet on tracking stress number from the Garmin activity tracker and recording the skills necessary to manage stress
 6. Monitoring your goal each week
 - j. Prompt: What was it like to do these health coaching sessions with Savannah?
Delivery
 - iv. Prompt: Did she relate well and meet the expectations you had for the health coaching calls? **Delivery**
 - v. Prompt: Would someone with different skills be better in this role? What kind of person/skills? **Delivery**
 - k. Prompt: Did these sessions help you with the knowledge or skills needed to set health goals? **Behavioral Capability Content**
 - vi. Prompt: When did it and when didn’t it?

9. What were your thoughts about the resources we provided during the program (i.e. the iPad, the website, and the Garmin Activity Tracker)? **Digital Strategy**
 - a. Prompt: You have access to the Sporks website with self-care information as well as information about child eating and activity. How have you used the website? **Digital Strategy**
 - i. Prompt: How has the website helped with the knowledge or skills needed to practice self-care?
 - b. Prompt: One resource that we presented to prompt you to be more mindful were the self-reflection worksheets (we called WaLTTR -Watch, Listen, Talk, Try, Reflect) in your eBinder. What did you do with these sheets each week? **Content**
 - c. Prompt: How did or didn't these sheets help you set and be mindful about your goals each week? **Content**
 - d. Prompt: Did you use your other handouts outside of meetings or go back through and read them? **Content**
 - e. Prompt: How did you use the Garmin activity tracker over the course of this program? **Digital Strategy**
 - f. Prompt: How did you use the iPad over the course of this program? **Digital Strategy**
 - g. Prompt: How was the iPad used in your household? Which members used it? **Digital Strategy**
 - i. Prompt: There were child apps on the iPad, did your children use them? If so, what did they think of them?
10. What did you think about getting text messages throughout the program with reminders and as a form of communication? **Digital Strategy**
11. What was it like to do the surveys that were texted to you?
12. Is there anything about this program that you would change?
 - a. Prompt: Are there any additional resources we could provide?
 - b. Prompt: What did you think about the time length of workshops and coaching sessions? **Delivery**
 - i. Prompt: Were 4 health coaching sessions too much, too little, or about right?
 - ii. Prompt: Were 2 workshops too much, too little, or about right?
 - c. Prompt: Many of our meetings were one-on-one through health coaching. Would you prefer more individual or group sessions? **Delivery**
13. What was one thing that you will walk away from this program with?
14. With COVID-19 and all of the schools closing, this spring was a fairly stressful time! What was it like having this self-care program in the middle of everything else that is going on?
 - a. Prompt: How were you able to use self-care topics in this program during this pandemic?

Thank you for your responses on what you thought of the program and how we can make it better! We've heard other moms agree that it is important to find time to talk about their own self-care. We've also heard from others that more information about their kids' healthy eating and physical activity would be helpful. A thought we had was to pair this program that you participated in with a family program about kids. I'd like to ask you a few questions about this next.

15. Our family-based program has six weeks of workshops on topics like picky eating, motor-skill development, and mindfulness in interactions and the family context. What are your initial thoughts on this family program? **Content**

a. Prompt: What topics of this family program interest you? (picky eating, motor-skill development, or mindfulness in families)

16. What are your thoughts about combining this self-care program with a family-based program like we described? **Delivery**

a. **Prompt:** Would you like the self-care program combined with this program or separate?

b. Prompt: We kept this self-care program shorter in length and time so that it might eventually join with this family program. How would you feel about coming to workshops about family topics while doing the self-care health coaching?

i. Prompt: What do you think about the time commitment of combining the two programs?

c. Prompt: Would it be better to do the family program during, before, or after the self-care program?

17. In addition to improving this program, we are also interested in making this program available to more families. What other digital tools would you want in addition to what we had in the self-care program with Zoom calls and the website?
- a. Prompt: Would you want a mobile app, more Zoom workshops, social media, videos, or something else? **Digital Strategy**
 - b. Prompt: What would need to change from the self-care program as you participated in?
 - c. Prompt: How would you feel about some sort of group or support over social networking like we've created with the Facebook page?
 - i. Prompt: Videos? Social media?
 - d. Prompt: What might be some challenges for parents getting the information this way (through a mobile app) instead of some in-person meetings?
 - e. Prompt: What would be some benefits for parents to getting information in this way (through a mobile app) as opposed to the in-person workshop like you all did?

APPENDIX X: HEROS SELF-CARE HEALTH FAIR REPORT CARD

PARENT SPORKSHOP

How is My Health?

Name _____ Date _____

		Recommended	You	Meets	Borderline	At Risk
Heart Health 	Total Cholesterol	< 200 mg/dL	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	HDL Cholesterol	> 60 mg/dL	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Systolic Blood Pressure	< 120 mm Hg	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Diastolic Blood Pressure	< 80 mm Hg	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>						
Diabetes 	HbA1c (blood sugar level)	< 5.7%	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>						
Weight Status 	Waist Circumference	< 35 inches	_____	<input type="checkbox"/>		<input type="checkbox"/>
	Body Mass Index (BMI)	18.5-24.9	_____	<input type="checkbox"/>		<input type="checkbox"/>
				Overweight is 25.0-29.9 Obese is > 30.0		

Physical Activity



Active Time
(moderate to vigorous)

At least 30 minutes, 5 times a week

Meets/
Exceeds



Needs
Improvement



Sleep

7-8 hours/night

Meets/
Exceeds



Needs
Improvement



Nutrition



Recommendations from the Dietary Guidelines for Americans. Visit www.choosemyplate.org for more information.

Fruits

2 cups/day

Meets/
Exceeds



Needs
Improvement



Vegetables

2.5 cups/day



Grains

6 oz/day



Whole Grains

3 oz/day



Dairy

3 cups/day



Protein

5.5 oz/day



This health card does not replace seeing your doctor. We recommend going to your doctor once a year for a checkup.

- Questions? Contact us at (970) 878-7154



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APPENDIX XI: SAMPLES FROM THE HEROS SELF-CARE WORKSHOP FACILITATOR GUIDES

Workshop I

Facilitator's Guide

Overarching Objectives:

By the end of the session parents will:

Social Cognitive Theory

- **Behavioral Capability (knowledge):** Gain knowledge on stress management, healthy eating, and physical activity as self-care activities.
- **Behavioral Capability (skills):** 1) Reflect about the self and the role of mother/ other roles (Anchor) 2) Gain knowledge about self-care and benefits of self-care/ how to find times to incorporate it in daily routine (Add) 3) Reflect on their own stress management, healthy eating, and PA as self-care (Anchor/Apply) 4) Identify a time where they might practice some self-care (Away).
- **Self-Efficacy:** build confidence in their ability to find or make opportunities to practice self-care; build confidence in ability to manage stress, practice healthy eating, and increase physical activity
- **Expectancies/Attitude:** believe that self-care is important for individual and family health and can drive improvements in health
- **Self-Efficacy & Reinforcement:** Plan to use WaLTTR framework to increase mindfulness and self-care, set goals related to self-care

Fidelity Instructions: In the box in each section of the first column, write a number that corresponds to the degree to which content was delivered. Jot any additional notes underneath the box. Also, make sure to highlight or circle words in the script as the facilitator uses them (or the idea to which they correspond).


Fidelity Checklist:


0=not at all


1=some parts


2=most parts


3=complete


Fidelity	Concept/Component	Script
	<p>Introductions/Program overview</p> <p>10 min</p>	<p>Welcome! Thank you all for coming tonight. My name is...and I am (some personal point of information/what qualifies you to be up here talking). Could we all go around and say your name and a little bit about yourself?</p> <p>Thank you for sharing and thank you all again for coming. Tonight we are going to talk about self-care.</p> <p>Self-care means different things to different people. What does it mean to you?</p> <p>Self-care is really any behaviors and activities we do to promote our own health and wellness, both physically and mentally. Tonight, we are going to jump right in and talk about how to prioritize and find time for our own self-care. We are here to focus on you and how to take care of you. We are going to try to be timely and move through several topics related to self-care as a busy parent. You'll have an opportunity to share with each other as we go along.</p>

	<p>Binder/Spork Introduction</p>	<p>If everyone could pull out their iPads. Saved in the FILES application on the home screen is an electronic binder. Can everyone find it? This will have resources and more information for each week's topic. Your health coach will use these handouts each week, so make sure you have your iPad when you meet with them!</p> <p>We are going to practice writing on our electronic binders now (iPAD AND E-BINDER HANDOUT GUIDE). We will be reflecting and jotting notes down tonight and I want to go over how to use these and our stylist! Go ahead and click the pen in the upper right hand corner. This will allow you to write or draw on your binder. The notes will automatically save.</p> <p>We are also going to take screen shots of some of our activities. To do this, click and hold the power button and tap the home button. (Walk around and guide)</p> <p>I'd also like to introduce everyone to the Spork family. This workshop is part of a larger program that we're building and this is the self-care portion. You'll see them at the top of all of your handouts.</p>
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	<p>Program Overview (Road map)</p>	<p>I want to start with just a quick overview of the next 6 weeks. (ROAD MAP HANDOUT) Everyone needs something different to feel healthy and happy, and as parents, there are certain demands on your time that can sometimes make it hard to find the time to do these things for yourself. We are excited to spend the next six weeks with you to discuss various topics related to self-care for you as busy moms.</p> <p>The title of this first workshop is Self-care for Health, which is really what this whole program is about. We all want to be as healthy as we can be, and we know that our health and wellness are related to our children, our partners, and even our friends.</p> <p>Over the next hour and a half, we'll start with a discussion about what it means to be yourself and a mom and how those relate to taking care of yourself. After tonight, you'll have the opportunity to meet with a health coach each week. You'll get your health fair results, get more information on healthy eating, physical activity, and stress management as self-care, as well as set goals and track them with your health coach! Then we'll meet together again in five weeks to reflect on how to find times to fit self-care in.</p> <p>We want this to be interactive and fun, so please feel free to speak up, ask questions and take advantage of all being here in this room together. Everyone has things that go well for them and their family as well as some things that may be a little more challenging, so it's a great opportunity to learn from each other. You are the experts on yourself, your self-care, and your family!</p>
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	<p>Guiding Principles</p> <p>5 min</p>	<p>The other thing I'd like to do before we get started is to lay out some guiding principles. If you flip to page 1 on your e-Binder, there is a page with these listed (GUIDING PRINCIPLES HANDOUT). We know that parenting is hard and sometimes can be stressful and chaotic. We all have good days and we all have bad days. Everyone is doing the best they can and what we are hoping is that we can find a few ways to make your job a little bit easier and celebrate you as a mom. Parenting is made up of so many small moments and it is human nature to dwell on the challenges and hard parts and forget or fail to celebrate the good moments or small victories. So some of our guiding principles for this program are:</p> <ol style="list-style-type: none"> 1. Finding ways to celebrate you as parents 2. Prioritizing time for you among all the other busy parts of the day 3. Focusing on the things that are going well <p>On the right hand side, you'll see a space to write about what you want to get out of this workshop. Take a second to think about this—what got you to show up today?</p>
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	<p>Ground Rules</p> <p>5 min</p>	<p>We think it would be a good idea to set up some ground rules for the evening —to get them from the group. We'll be discussing some sensitive things and want everyone to feel safe to share! Some of the things that we are thinking about are:</p> <ol style="list-style-type: none"> 1) not judging each other; 2) listening while others are sharing (being present); 3) being on time for our workshops/health coaching or communicating if you can't be. 4) <u>What else is important to everyone that we might want to include here?</u> <p>(make a list from the group; if no one brings up the following: what about cell phones? What about making your best effort to make it to every session? Accountability?)</p>
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	Red Ball Activity	<p>Now we are going to get up, move around a bit, and work as a group instead of only listening [Please stand up]. We're going to do sort of a pretend activity – it has a lesson and a reason for doing it which will become more obvious as we go through it. The name of this activity is red ball. What we are going to do is take a pretend red ball and throw it to someone and say “<i>red ball</i>.” The person will catch it and throw it to somebody else, also saying “<i>red ball</i>” as they throw it. So I'll start this out by throwing it to [co-facilitator] and I'll say “<i>red ball</i>” (thrown to [co-facilitator], then s/he will throw it to someone else and say “<i>red ball</i>”).</p> <p>[start out by throwing the pretend ball; let it go for 30 sec to 1 minute]</p> <p>So what did you notice about doing that? What was the part that was a little anxiety provoking?</p> <p>[some ideas if no one brings up – didn't know who to throw it to and didn't know if the person was looking at you or not to throw it to them...]</p> <p>Ok, now this time, I'm going to throw it to [co-facilitator] and I'm going to say “<i>red ball</i>” and look her in the eye and she is going to say “<i>red ball</i>” back to me <u>before</u> I throw it to her.</p> <p>[do activity with new instructions]</p> <p>So...did you notice a difference between 1st and 2nd time?</p> <p>[some ideas – were ready, eye contact and acknowledgement – eye contact to say can I send it to you, then the other person acknowledged that they got it.]</p> <p>So we're going to pick up the speed a little. We're going to start with red ball, but also going to introduce yellow ball. We're also going to add one other piece to it, I'm going to make eye contact, say “<i>red ball</i>,” throw it, and then [co-facilitator] will say “<i>red ball</i>” but will also say “<i>thank you</i>” After they catch it.</p> <p>[do activity, after a little bit, throw in yellow ball...throw in green ball...]</p>
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
		<p>Ok, so would you have imagined that you would do that? 3 balls going all at the same time? How come it worked?</p> <ul style="list-style-type: none"> - You were looking all around the group, listening very well - Asking for some permission to throw it, make sure people were paying attention - Acknowledging that you got it <p>We all are juggling a lot, but we bring our attention to a particular activity, we can get it done. We are going to talk today about paying attention to and prioritizing ourselves and our self-care. Let's be intentional in this workshop today and listen to each other, acknowledge each other. Lesson in this is when you talk to people, even when it's a little chaotic and a lot is going on, when you get their attention, ask for permission, listen to them and acknowledge and say thank you... the communication happens and no one drops the balls. We are present here today with each other.</p> <p>[sit back down]</p>
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	<p>Reflection on the Self/Self collage</p> <p>15 min</p>	<p>Thank you! These will set our tone as we talk about self-care. Self-care is really any behaviors and activities we do to promote our own health and wellness, both physically and mentally. Before we can know what really recharges us, however, it's important to reflect on who we are and areas where we need to take care of ourselves. Who we are goes beyond the roles and jobs that we have and establishes us as unique and separate individuals. With this knowledge, we can begin to make choices about how we want to take care of ourselves.</p> <p>Scroll down to the next page in your e-binder (SELF-CARE HANDOUT 2). I am going to take a few minutes to reflect on some of these things. I will ask some questions for reflection, and you'll have a few minutes to write things down on this paper here or write notes on this e-binder. We'll share after if you are comfortable. On the left side of this page, think about some of the roles and jobs that you have on a daily basis.</p> <ul style="list-style-type: none"> · Prompt: wife/mother/partner? <p>On the right side of the page, think about who you are outside of these roles, as well. What do you like to do and how would you describe yourself? On the other side of the page, think about what makes you you?</p> <p>Now think about it in terms of time. Who were you before kids? What kinds of things did you like to do?</p> <ul style="list-style-type: none"> · Prompt: Who are you now and who do you want to be? What kinds of things make you happy? <p>Sometimes who we are changes when our roles change and sometimes we have things that we would like to do or be if we just had more time or more resources. Who would you be in an ideal world--does it match with who you are?</p> <p>Let's take a second to reflect on some of these things and write them down or record them on your iPad.</p> <p>[pause for a few minutes]</p>
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	<p>Self-collage</p>	<p>Based on what we just reflected on--who we are as individuals--let's put these in to a collage. There is a blank page on the next page of your e-binder. Using what we just talked about and what you just wrote down, I want you to draw, write, color, use emojiis, or create images that represent you and who you are. This is a collage of who you are.</p> <p>Here's mine for an example [show and describe]. Having a visual representation of things that make you who you are will guide our discussions about self-care. We'll spend a few minutes doing this.</p> <p>Some things to think about as you're putting these things together:</p> <ul style="list-style-type: none"> · Prompts: What comes to mind when someone asks, "Who are you?" <ul style="list-style-type: none"> ○ Where do you find your identity? ○ How would others describe you? ○ What are some of your hobbies? <p style="text-align: center;">§ Did these look differently before having a child/ren?</p> <p>As you finish your self-collage, one of us will go around and help you take a screen-shot picture of it!</p> <p>Would anyone like to share some of the things that they included on their collage?</p>
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	<p>Mom's Hierarchy of Needs Ladder</p> <p>10 min</p>	<p>Parents have a lot of different roles—some that we just talked about! Look at all of the things that you're doing as moms. One thing that we know from what moms tell us and the different research we've done is that moms can feel a lot of stress.</p> <p>All these different parts of self and roles can build up to feelings of stress. How many of you have felt stressed? [pause]</p> <p>We all have felt that, but what can we do? How do we take care of ourselves when we're feeling stressed?</p> <p>On the next page of your e-binder, you have a picture of a ladder (HANDOUT 3 HIERARCHY OF NEEDS). I have printed copies out, as well. First, write a list of things where you spend your time on each and every day. Some things might be children's needs, significant other's needs, household chores, and your own needs. Try to be as specific as possible.</p> <p>When you have a list, go ahead and write them on this ladder in order from the most time spent (at the top of the ladder) to the least time spent (at the bottom of the ladder). What do you prioritize with your time? Everyone prioritizes things differently so everyone's ladder will look different.</p> <p>[Pause]</p> <p>Time spent on activities doesn't always match our priorities, but sometimes it does. To the right of your ladder, right the approximate amount of time spent daily on each activity. This could be in hours or minutes.</p> <p>Does anyone want to share what their ladder looks like? While we are sharing, go ahead and screen-shot a picture of your ladder.</p> <ul style="list-style-type: none"> • Prompt: Did your time spent match the ranking so that those activities you ranked higher in priority also had the most time required? • Prompt: Where do you and your own needs fall on this ladder? Did they make it on to the ladder?
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		<p>Great, now I want us to think about where we might be able to take some time to fit in ourselves and our own self-care. What would happen if we prioritized things differently? Where might I change my percentage of time spent just a little bit so that I maybe have a little time? We have already thought about what our current reality is in terms of things that we prioritize, but if we could find little bits of time here or there, where could we take time from to find time for ourselves? What would that look like?</p> <p>Thank you for sharing. To the right, you'll see another ladder. In this ladder, I want you to write your ideal priority list and ideal times.</p> <ul style="list-style-type: none"> • Prompt: How do your reality and your ideal compare? Do they match anywhere? What is different? <p>Our own personal self-care can often be put down low on our list of things that we prioritize. We're spouses, partners, and parents and we don't pay enough attention to ourselves.</p> <p>What happens when we don't pay enough attention to ourselves and our own needs?</p> <p>[Pause]</p> <p>Prompt: More stress, health difficulties, emotional difficulties, etc.</p> <p>Self-care can seem a little selfish--often it's hard to prioritize our own needs on our ladders, but how does the saying go? You can't pour from an empty bucket. It's important to feel full and get rid of the guilt surrounding taking care of ourselves. It's important to do the things to help us be the best version of ourselves and really care for our whole self. We'll talk more about different ways to refill our own buckets and recharge our batteries.</p>
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	<p>Self-care</p> <p>9 min</p>	<p>So let's switch to the next page in our e-binders and talk a little bit more about what self-care is (HANDOUT 4 WHAT IS SELF-CARE). Self-care is any activity that we do to take care of our own wellbeing. It can have many components: physical, spiritual, educational, and emotional.</p> <p>This program will focus on the physical side of self-care: healthy eating, physical activity, and stress management.</p> <p>Eating as a form of self-care entails fueling and nourishing our bodies with the nutrients that we need and with how much food we need. It's also takes in to account the types of foods that we enjoy— What are some other examples of eating as a form of self-care?</p> <p>Prompt: so for example, healthy eating as self-care might include cooking a nice meal for ourselves and our families with components that we enjoy that also help nourish us. It also might be just remembering to feed ourselves when things get busy. Could be healthy snacking, eating regularly, etc.</p> <p>Physical activity as a form of self-care has to do with getting the activity that our bodies need and doing the types of activities that we enjoy. Self-care isn't just about forcing ourselves to do healthy things, but about finding the things that we like that will also help us be healthy! What are some other examples of physical activity as a form of self-care?</p> <p>Prompt: For example, going for a brisk walk or playing with our children can be enjoyable and good for our health!</p> <p>Stress management as a form of self-care has to do with dealing with our stress. Stress can be tough on our bodies when felt over long periods of time and it can be important to find ways to make healthy decisions even when things are busy or stressful. What are some other stress management strategies that could be a form of self-care?</p> <p>Right now I want to talk a little bit more about this stress management side of things, but you'll have the opportunity to talk with your health coach about these other things in the coming weeks!</p>
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	<p>Mindfulness</p> <p>15 min</p>	<p>We've talked about how things can get stressful and all of the different demands on your time as parents. There are different things we can do to manage stress---eat healthy, keeping organized, and other things people have found to help with stress---mindfulness is one. How many of you have heard of mindfulness?</p> <p>Mindfulness is just a set of different skills that people can use to help them stay calm, relieve some of their felt stress and has been shown to have many other health benefits. Mindfulness is often used in stress management to pause the reactive emotions we might feel in a stressful situation and breathe or reflect before moving on. Mindfulness is just paying attention in a particular way to what is going on in our lives and in our own emotions in the present moment without judging what is going on or labeling it as good or bad.</p> <p>Let's do an activity to help explain what this means.</p> <p>One way that we help relieve our stress is through deep breathing and paying attention to your breathing is one part of being mindful.</p> <p>Let's try that right now. Let's sit, get in to a comfortable position. Close your eyes if you would like. Just pay attention to your breath. Breathe deeply in through your nose and out through your mouth. Let's do this for a few moments.</p> <p>[Pause]</p> <p>Ok, coming back, how did that feel? What did you notice?</p> <p>[Pause]</p> <p>I have another question: What did you hear?</p> <p>[Pause]</p> <p>Ok, let's do it again. This time, I want you to pay attention to what you hear. Some sounds might be close, some might be far, some might be internal like your heart or stomach. Go ahead and spend a few moments breathing and listening.</p>
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		<p>[Pause for a few moments]</p> <p>What's different from what you heard the first time versus the second time?</p> <p>Prompt: This time, you were mindful of the sounds around and within you. You were focusing your attention on things you're hearing. You were paying attention on purpose and you did this with a sense of curiosity. You weren't evaluating the sounds or labeling the sounds as good or bad.</p> <p>We can use the state of paying attention on purpose non judgmentally to a lot of things we do... the work we do in our house, the ways we interact with our kids, to how we approach our own self-care... being mindful about how we are feeling, what we are telling ourselves, the different things that we are doing because of how we are feeling... these are all important parts of being mindful and our own self-care.</p> <p>Mindfulness also means paying attention to our own emotions, our own bodies (how does our body feel?) and bringing a sense of curiosity and non-judgement and kindness to our bodily states.</p> <p>If you flip to the next page in your e-binder, you'll find more information about mindfulness (HANDOUT 5 WHAT IS MINDFULNESS)!</p> <p>We can also eat mindfully, paying attention to the taste and textures of the food as well as move mindfully, paying attention to the feelings in our body as we are active.</p> <p>You'll talk more about mindfulness with your health coach in the coming weeks. Each week you will be setting a goal with your health coach, but we will start tonight by starting to think about how to fit self-care in to our schedules. Today we talked about who we are and started to think about those things that we need to do to care for ourselves. We talked about what self-care is and how we prioritize it among all of the other things that we have to do in a day. I heard from many of you that time is a major constraint, and I want to revisit how we might find these brief moments of time where we can prioritize ourselves. We have a sheet in your binder that will help us be mindful about finding these times.</p>
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	<p>WaLTTR</p> <p>5 min</p>	<p>If you flip to the next page in your e-binder, you'll find Walter Whisk. WaLTTR stands for Watch, Listen, Talk, Try, and Reflect (HANDOUT 9 WaLTTR). This framework helps with goal building and with being mindful about our goals. This week, we will be thinking about what we talked about today—where might you be able to find the time to give more to yourself? WaLTTR will help us do that.</p> <p>Watch: This week, we want to watch how we spend time. We are looking for those moments of opportunity for self-care. We talked a little bit ago about how mindfulness is paying attention in a particular way non-judgmentally. This means giving ourselves a break and not being too judgmental about our trying to find time for our self-care. Watch for judgment about your self-care and document where you notice spending time that might be used for self-care.</p> <p>Listen: Listening to our bodies for what they need can help us to identify good times for self-care. This might include listening to our bodies for when they are hungry or full; listening to our bodies for the feelings associated with our physical activity goals; listening to our bodies and how they react to stress and stress management efforts. How will you listen this week for the types of self-care you need?</p> <p>Talk: Talking about our drive to find more time for self-care can hold us accountable and also bring in people to support us! Who might you tell about your efforts to prioritize your own self-care?</p> <p>Try: Try to incorporate more opportunities for self-care this week! Remember to try to find times for self-care without judgment or anger or frustration toward the process.</p> <p>Reflect: After you try incorporating more opportunities for self-care this week, what went well? What would you change? What would you keep the same? When might you give time for reflection on your goal?</p> <p>Use WaLTTR this week to help you be mindfully aware of where you might include more time for self-care.</p> <p>[Pause]</p>
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	<p>Self-care Hack</p> <p>10 min</p>	<p>So we have talked about how we prioritize ourselves in reality versus our ideal world. We talked about giving ourselves permission to practice self-care and finding those moments of time that we can transfer to ourselves. As I mentioned, we are all experts in our own lives and in our own self-care. I want to spend a few minutes talking about those self-care hacks that you have and that work for you?</p> <ul style="list-style-type: none"> • Prompt: What tips might you give a new mom to find time for her own self-care? • Prompt: What are some tips you could share and takeaway for finding time for self-care?
	<p>Wrap-up</p> <p>5 min</p>	<p>So we are now approaching the end of our time together, and I want to be respectful of your time and get you out of here when we planned!</p> <p>What questions does everyone have about what we talked about tonight?</p> <p>As I mentioned, you all will have a chance to meet with your health coach each week. If you haven't chosen a time, yet, the sign up sheet is here! Please have your iPad and e-binder with you when your health coach calls!</p> <p>Your health coach will also ask you about your WaLTTR from tonight, so don't forget to Try it! Feel free to add to anything we worked on or talked about this week.</p> <p>I also have your health fair results here. I will pass these out to you now, but you will have the opportunity to talk with your health coach about these and ask questions! Make sure that you have them when you meet with your coach!</p> <p>Finally, I want to pass out an activity tracker. You and your health coach will be using these to set goals and monitor/track goals. I want to walk through these for a second, but there is also an info sheet in your FILES and printed out here. (HANDOUT—ACTIVITY TRACKER INFO SHEET)</p> <p>Thank you all again so much for coming. We will see you all back here again in four weeks after you've met with your health coaches!</p>

APPENDIX XII: SAMPLES FROM THE HEALTH COACHING FACILITATOR GUIDES

Week 2

Facilitator's Guide

Health Coaching Session 1: Goal Setting for Health

Overarching Objectives:

By the end of the session parents will:

Social Cognitive Theory

Behavioral Capability (knowledge):

- Gain knowledge on how setting goals for health can be beneficial (Add)

Behavioral Capability (skills):

- Set, monitor, and reflect on goals set for self-care including: improve diet quality, increase time spent in moderate to vigorous activity, and manage perceived stress.
- Reflect on incorporation of self-care into their week and on their own health goals and how these relate to their stress management, healthy eating and PA (Apply/ Anchor); set goals or specific changes they desire to make for self-care (Away).

Self-Efficacy:

- Build confidence in their ability to find or make opportunities to practice self-care;
- build confidence in ability to manage stress, practice healthy eating, and increase physical activity;
- will increase self-efficacy to apply goal setting for health strategies to areas they want to change relating to healthy eating, PA, and stress-management

Expectancies/Attitude:

- Will see goal setting as worthwhile and how it can be used to improve self-care and health

Self-Efficacy & Reinforcement:

- Plan to use WaLTTR framework to increase mindfulness and self-care. Set goals related to self-care and self-monitor these goals in conjunction with a health coach

Note:

- Have the master iPad in front of you before beginning and health fair results for the participant

Introduction & Greeting		
Fidelity	Key Points	Background/Script
<div></div>	<ul style="list-style-type: none"> • Introduce yourself • Introduce topic of session: goal setting for self-care • Acknowledge that the day may have been stressful and that we are meeting in the middle of the day • Deep breathing can help let go of tension and allow you to focus on being present, in the moment • Thank participant 	<p>Hello! My name is XX, we met last week at the workshop! How are you doing today? Is now still a good time to talk?</p> <p>This is the health coaching session from the self-care workshop that you attended last week. Today we are going to talk about how to set a goal for self-care... so we'll have a chance to talk about some of the things that you reflected on during the workshop and talked about with the other moms before setting a goal! Then, at the end, I'll ask you some questions about how this health coaching went (just like we did at the end of the workshop last week) How does this sound?</p> <p>Awesome. Is it OK if I record this? I just want to make sure I capture everything so I can go back through for my own reference.</p> <p>Thank you so much, and thank you for participating in the workshop and this coaching session! First, I want to recognize how busy you are, and I appreciate you taking the time to talk with me and focus on you. If you remember from last week, we talked about mindfulness and did that breathing exercise? I wondered if we might start with just a few deep breaths today—recognizing that we are coming together to meet and focus on you amidst all the other things going on in our day. So let's take four or five deep breaths to ready ourselves and bring our attention to the moment. Go ahead and breath—let me know when you're done.</p> <p>[demonstrate a few deep breaths].</p>

Review from Workshop		
Fidelity	Key Points	Background/Script
<div></div>	<ul style="list-style-type: none"> Identifying main take-aways from the workshop last week Reflecting on the health fair results and answering questions Getting participant to start thinking about what area they would like to set a goal for this week 	<p>Thank you! So to start, I'd like to talk about the workshop last week. What were your main takeaways from last week's workshop?</p> <p>Prompts:</p> <ul style="list-style-type: none"> Were there new things you learned about yourself or your priorities? Were there things that you learned from the other moms there? Were there things that you thought more about with regard to what we talked about self-care and before kids versus after kids? Were you able to find any extra time to fit self-care in? At the end of the workshop, we talked about watch, listen, talk, try, reflect (Walter). Did you think about this at all over your weekend? <p>Building off that, what are you hoping to get out of this session today?</p> <p>I mentioned that we were going to work together to set a self-care goal today. Are there any areas related to health that you are motivated to make changes to? Any areas of self-care you want to do more of?</p> <p>You got your health fair results back at the end of the workshop last week. Do you have any questions on these results?</p> <p>Prompts:</p> <ul style="list-style-type: none"> What information from the health fair were you most proud of? What was the most surprising? What changes in physical activity, healthy eating, or stress management would you want to make based on information from the health fair? Is there anything that you see as a need for change? <p>Transition: Do you have any other questions before we starting talking about goal setting?</p>

SMART Goals		
Fidelity	Key Points	Background/Script
<div></div>	<ul style="list-style-type: none"> Identify an area of self-care that participant would like to set a goal for today Introduce SMART goals briefly 	<p>So let's talk about actually setting a goal. Last week we talked about different types of self-care and finding time to fit them in based on who you are, what you enjoy, and what you need to be full. Is there something or some form of self-care that we talked about that particularly resonated with you or that you were more excited about? In our health coaching sessions we will be talking about healthy eating, physical activity, and stress management but your goal doesn't necessarily need to fit into one of those categories.</p> <p>Prompts:</p> <ul style="list-style-type: none"> What area of self-care should we focus on today to set a goal? This could be about eating—do you want to eat more of a certain type of food? Less eating out? This could be about activity—going for more walks or working out? This could be about stress-management? What changes in physical activity, healthy eating, or stress management would you want to make based on information we talked about last week? What is important to you right now in terms of health? What do you want to achieve in terms of health? Are there any areas of health that you feel motivated to make a change in? Are there any areas of self-care that you want to see more of in your life? <p>If you have your iPad with you, scroll to page 11. When we set goals, we have clear expectations on what we want to change. For example, if I want to exercise more, I need a clear goal that outlines the things I need in order to accomplish that goal. Do I need new shoes? What type of exercise do I want to do? What does “more” mean?</p> <p>Goals must be SMART or specific, measurable, attainable, realistic, and timely. Have you heard of this before?</p> <p>Specific goals have a what, when, why where, What am I doing, when am I doing it, why, and where will I do it? (Relate it to what they mentioned wanting to make a change to)</p> <p>Measurable goals are goals that we can track. How do we know if we have accomplished our goals?</p>

	<ul style="list-style-type: none"> • <p>Attainable goals are motivating goals. We also need to have all the supplies necessary for completing the goal. What resources do I need to accomplish my goal? (Shoes, schedule, etc.) Do you need to tell anyone (significant other or running buddy) about your goal to add a resource? Do you need to go to the library, get a library card or find a babysitter?</p> <p>Realistic goals are goals that we can get excited about. They aren't too hard, but they're not too easy.</p> <p>Timely goals give us some time to complete them, but not too much time where we can forget about them or think that we will accomplish them tomorrow.</p> <p>Transition:</p> <ul style="list-style-type: none"> • What do you think about this? <p>Do you have any questions about SMART goals?</p>
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Setting a Self-care Goal		
Fidelity	Key Points	Background/Script
<div></div>	<ul style="list-style-type: none"> Using the prompts, help participant set a SMART goal for self-care to work on over the next week. Remind participant: <ul style="list-style-type: none"> Will check in next week about the goal Repeat goal back to participant 	<p>Now, I want to work with you to set a health goal.</p> <p>Let's use the questions that you have in your binder about setting goals for health to set a new goal for this coming week. You mentioned wanting to focus on_____.</p> <p>SPECIFIC: What, when, where, and why are you doing this goal?</p> <p>Prompts:</p> <ul style="list-style-type: none"> You mentioned X as a potential goal, what might this look like for you? HE: What do you want to eat more/less of? When will you prepare these foods/eat these foods/shop for these foods? Where will you prepare these foods/eat these foods/shop for these foods? Why are you doing this? PA: What activity do you want to do? When will you do this activity? Where will you do this activity? Why are you doing this activity? SM: What will you do to manage your stress? When will you do this to manage your stress—how will you remember if in the moment? Where will you do this stress management? Why will you do this stress management? <p>MEASURABLE: How will you track your progress?</p> <p>Prompts:</p> <ul style="list-style-type: none"> HE: How will you keep track of your eating goal and whether or not you have done it? Where will you write it down/record it? (The iPad has a food journal you can write on or there are apps you can use! See the resource list at the end of your eBinder) PA: How will you use your activity tracker to monitor this? What do you want to measure—steps or intensity or vigorous activity? SM: How will you measure this? You can use the stress level tracker on your Garmin device! <p>ATTAINABLE: What resources do I need to accomplish my goal? (Shoes, schedule, etc.)</p>

		<p>Prompts:</p> <ul style="list-style-type: none"> • HE: Do you need to go to the grocery store? Do you need to make a grocery list? Do you need a food log? • PA: Do you need shoes? Do you need a babysitter? Do you need to talk with your significant other or family? • SM: Do you need a journal? Do you need a babysitter? Do you need a reminder (timer or app or mark on your hand)? <p>REALISTIC: What are you excited about for this goal?</p> <p>Prompts:</p> <ul style="list-style-type: none"> • Is this goal a good level of challenge? Is it possible to be successful with this goal? • What makes this self-care rather than just another thing to put on your to-do list? <p>TIMELY: What is your timeline for this goal? When do you plan to have met this goal?</p> <p>Prompts:</p> <ul style="list-style-type: none"> • When might you gather X materials? • When do you see yourself starting this goal? <p>Transition: To summarize, your SMART goals is _____. How does that sounds? Do you have any other questions before we move on?</p>
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WaLTTR		
Fidelity	Key Points	Background/Script
<div></div>	<ul style="list-style-type: none"> • Mindfulness can help with goal accomplishment • Point participant to eBinder on iPad • Walk through WaLTTR 	<p>We talked about mindfulness and monitoring our feelings last week at the workshop. You have another WaLTTR in your ebinder on page 13. At the top of this WaLTTR, you'll see space to write the goal we just talked about. Go ahead and fill that in so you have your goal in writing!</p> <p>This WaLTTR is meant to help you mindfully refine your goal as you go through this week. Let's go through this now:</p> <p>Watch how well your goal goes this week. Look for areas of success and places where you might need to alter your goal a little more.</p> <p>Listen to your body when trying this goal. How do you feel before and after doing this goal?</p> <p>Talk about your goal with someone. Who could support you in this goal?</p> <p>Try it!</p> <p>Reflect on your goal and the process. What went well this week? What needed adjusting? Was your goal too tough or too easy?</p> <p>During our health coaching next week we can follow up with this goal to see how it's going. Depending on how it's going, we can change it, build on it, or even set a whole new goal.</p>

Closing		
Fidelity	Key Points	Background/Script
<input type="checkbox"/>	<ul style="list-style-type: none"> Restate participant's goal and key points participant mentioned Have Master iPad with you to explain resources Mention spork website Have them click the Garmin Connect App to synch data Sporkwork 	<p>So we have talked about a lot of things today. We talked about setting goals for health, and then we set a goal: _____ (state goal that was set).</p> <p>On your iPad are a few resources that I would like to point out to you. First, we have a website with information about self-care and much much more!</p> <p>[instruct on how to access]</p> <p>To prepare for our session next week, I am going to ask you to: (For healthy eating) look back through the pictures that you took on your iPad of your meals at the start of this program. Also look back through your health fair results on your report card. Think about what you like about your diet. What do you feel you eat enough of and what do you wish you ate more of? Make note of areas that are challenging and areas of success. Write down any questions you might have throughout the week. Also, please write down and track what you eat each day this week along with what you're doing at that time. There's a sheet in your eBinder to do this on or you can jot it down anywhere (page 27!). We will then use the pictures and your WaLTTR next week when we talk in our coaching session!</p> <p>OK! I have us meeting the same time next week on _____ at _____. I will send a reminder text. Will this still work for you?</p> <p>Before we hang up, I would like to check-in with you about our session today. Can I ask you three questions?</p> <p>[If yes] Thank you! So on your iPad, in the files there is a scale saved. It is called Health Coaching Question Scale. Do you see it?</p> <p>Using this scale...</p> <p style="text-align: center;">Feelings of Confidence Week 2</p> <p>The statements below are about setting self-care goals. There are no "correct" ways of reacting; people feel differently about these questions. Please check the box that best states how confident you feel about each statement.</p> <p style="text-align: center;">[See questions below]</p> <p>Thank you so much! I will talk with you next week! Have a nice rest of your week</p>

How confident are you that you can:	1 No confidence	2 Very little confidence	3 A little confident	4 Moderately confident	5 Confident most of the time	6 Very confident	7 Completely confident
1. Set SMART goals for your own self-care?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Make progress toward your self-care goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Adjust your self-care goal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX XIII: HEROS SELF-CARE PROCESS DATA COLLECTION FORMS (SELECT)

Health Coaching Notes Week 1

Participant Name: _____

Participant Meeting Time _____

Week 1: Goal Setting

<i>Garmin Activity Tracker Data</i>						
Date/Day:	Thursday	Friday	Saturday	Sunday	Monday	Tuesday
Steps						
Stress Level						

Coaching Context:

- How many times did it take to contact participant:
- Participant affect:
- Noticeable external influences or distractions:

Coaching Content:

- What was discussed:
- Goal set:

Participant Notes:

Coaching Notes:

Ease of coaching

- 1 Very easy
- 2 Moderately easy
- 3 Neither easy nor difficult
- 4 Moderately difficult
- 5 Very difficult

Notes (why you chose that response):

Level of engagement of participant

- 1 Extremely interested
- 2 Very interested
- 3 Moderately interested
- 4 Slightly interested
- 5 Not at all interested

Notes (why you chose that response):

Self-efficacy Questions

How confident are you that you can:	1 No confidence	2 Very little confidence	3 A little confident	4 Moderately confident	5 Confident most of the time	6 Very confident	7 Completely confident
4. Set SMART goals for your own self-care?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Make progress toward your self-care goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Adjust your self-care goal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Week 1

Parent Workshop Process Form

Please write notes, as they pertain, in the appropriate rows and columns. This is NOT a fidelity checklist but rather a place to write about content, delivery, actions, activities that:

- 1) Work well
- 2) Need improvement
- 3) Could be done to address the issues

If an area is not covered that week, write NA or cross it out.

Concepts and Components	Process comments---Parent workshop
Present	
Absent	
Dinner	
<ul style="list-style-type: none">• iPad issues and questions• Check-in on website usage• Photos that were expected	

<ul style="list-style-type: none"> • Intro/program overview (anchor) <p>Binder/Spork Introduction</p>	
<p>Program Overview</p> <ul style="list-style-type: none"> - Road Map - Guiding Principles - Rules <ul style="list-style-type: none"> - Handouts 	

Red Ball - Delivery of content - Activity	
Reflection on the Self/Self collage - Delivery of content - Handouts - Activity	

Hierarchy of Needs Ladder <ul style="list-style-type: none"> - Delivery of content - Handouts - Activity 	
Self-Care <ul style="list-style-type: none"> - Delivery of content - Handouts 	

Mindfulness - Delivery of content - Handouts - Activity	
Wrap up: <ul style="list-style-type: none"> • WaLLTR of the week <ul style="list-style-type: none"> • Describe Health Coaching and confirm time <ul style="list-style-type: none"> • Pass out Garmin and explain Other	
Participant Notes (affective state, level participant, etc)	

ACTION ITEMS	<ol style="list-style-type: none"> 1. 2. 3. 4.
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APPENDIX XIV: HEROS SELF-CARE PROGRAM KEEP MODIFY OMIT TABLE

Appendix XIV. HEROs Self-Care Program Strategies to Keep, Modify, or Omit

Strategies to Keep	Strategies to Modify	Major Modifications or Omit
<ul style="list-style-type: none"> Virtual health coaching via videoconferencing on the tablet worked well. 	<ul style="list-style-type: none"> Include contact with health coach throughout the week (texting) 	<ul style="list-style-type: none"> Research creative strategies to draw participants to the study website and iPad applications or make all study materials accessible only on the website or applications.
<ul style="list-style-type: none"> Activity trackers provided information on stress levels and step count. 	Healthy eating content: <ul style="list-style-type: none"> Include recipe videos and written recipes Include information from the larger HEROs Study (e.g. picky eating tips, motor skill development, and healthy behaviors as a family) 	<ul style="list-style-type: none"> EMA data collection did not function as intended. Consider having the health coach gather this data.
<ul style="list-style-type: none"> Physical Activity content to encourage goal setting relating to physical activity worked well. 	<ul style="list-style-type: none"> Reinforce mindfulness content and introduce stress management health coaching session earlier to give better context to breathing exercises 	
<ul style="list-style-type: none"> Mothers enjoyed getting together during the group workshops 	<ul style="list-style-type: none"> Incorporate 2 additional health coaching sessions to allow for information on other forms of self-care: educational, spiritual, relational, etc. 	
	<ul style="list-style-type: none"> Add 30 minutes to each workshop 	
	<ul style="list-style-type: none"> Add content to eBinder on other forms of self-care for additional health coaching sessions 	
	<ul style="list-style-type: none"> Social support could be incorporated more throughout the program. Texting with the health coach, providing longer during the workshops for discussion (by adding 30 min) and possibly adding a social media group could meet these needs. 	
	<ul style="list-style-type: none"> Can participants make use of their own activity trackers instead of using the study-provided trackers? 	