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Feasibility and Acceptability of a Home-Based Intervention to Modify Maternal Food Parenting Practices

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FEASIBILITY AND ACCEPTABILITY OF A HOME-BASED INTERVENTION TO MODIFY MATERNAL FOOD PARENTING PRACTICES

BY

AMY MICHELLE MOORE

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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MASTER OF SCIENCE THESIS
OF
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UNIVERSITY OF RHODE ISLAND
2016
ABSTRACT

Background: Food parenting practices play an important role in the development of a child’s eating behaviors, and subsequent weight status early in life. Yet studies to modify and improve these practices are limited. This study explored the feasibility and acceptability of a novel home-based motivational interviewing (MI) intervention designed to modify and improve the food parenting practices of low-income mothers.

Methods: Mother-child dyads (N=15) were recruited from a Women, Infants and Children (WIC) office in southern Rhode Island. A non-experimental, pretest–posttest design was used to assess changes in maternal food parenting practices. Dyads participated in three home-based sessions that included baseline measures and an evening meal video recording at session 1, an MI intervention that included feedback on the evening meal video recording at session 2, and a satisfaction questionnaire at session 3. Pretest–posttest measures included five subscales of the Comprehensive Feeding Practices Questionnaire.

Results: Fifteen mother-child dyads (mothers: 32.3, SD = 4.6 years, 86.7% White; children: 3.2, SD = 0.9 years, male = 73.3%, 66.7% White) completed the study. Paired-samples t-tests showed a statistically significant decrease in the use of ‘food as reward’ (p = 0.03). Ninety-three percent of mothers ‘strongly agreed’ that it was worth their effort to participate in the study. Sixty percent ‘strongly agreed’ that the study increased their interest in learning to feed their child in healthy ways.

Conclusion: Home-based MI interventions may be an effective strategy for modifying maternal food parenting practices in low-income populations. Most mothers found that watching themselves was “eye-opening” and applicable to their own lives.
ACKNOWLEDGMENTS

In *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants*, Malcolm Gladwell states, “Courage is not something that you already have that makes you brave when the tough times start. Courage is what you earn when you have been through the tough times and you discover they are not so tough after all.” I would like to extend my deepest gratitude to my committee members who have supported me through the ‘academic’ tough times and helped me understand the meaning of courage. Dr. Alison Tovar, I am grateful for your expert guidance and thoughtful support. Your unwavering passion and advocacy for childhood obesity prevention has inspired me, and helped to crystallize my own career trajectory. Drs. Kathleen Melanson and Mary Clair-Michaud, I am grateful for your valuable insights and helpful feedback. Dr. Ingrid Lofgren thank you for reminding me that hard work will open doors.

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Finally, to my amazing family, without your encouragement and support I would not be the woman I am today. You have instilled in me the value of hard work, and the importance of reaching for my dreams. To my partner, Eric Salomaki, I am forever grateful for your guidance and unwavering support.
PREFACE

This Thesis was written to comply with the University of Rhode Island graduate school Manuscript Thesis Format. This Thesis contains one manuscript: *Feasibility and acceptability of a home-based intervention to modify maternal food parenting practices*. This manuscript has been written in a form suitable for publication in *Childhood Obesity*. 
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CHAPTER 1

Feasibility and Acceptability of a Home-based Intervention to Modify Maternal Food Parenting Practices

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ABSTRACT

Background: Food parenting practices play an important role in the development of a child’s eating behaviors, and subsequent weight status early in life. Yet studies to modify and improve these practices are limited. This study explored the feasibility and acceptability of a novel home-based motivational interviewing (MI) intervention designed to modify and improve the food parenting practices of low-income mothers.

Methods: Mother-child dyads (N=15) were recruited from a Women, Infants and Children (WIC) office in southern Rhode Island. A non-experimental, pretest–posttest design was used to assess changes in maternal food parenting practices. Dyads participated in three home-based sessions that included baseline measures and an evening meal video recording at session 1, an MI intervention that included feedback on the evening meal video recording at session 2, and a satisfaction questionnaire at session 3. Pretest–posttest measures included five subscales of the Comprehensive Feeding Practices Questionnaire.

Results: Fifteen mother-child dyads (mothers: 32.3, SD = 4.6 years, 86.7% White; children: 3.2, SD = 0.9 years, male = 73.3%, 66.7% White) completed the study. Paired-samples t-tests showed a statistically significant decrease in the use of ‘food as reward’ (p = 0.03). Ninety-three percent of mothers ‘strongly agreed’ that it was worth their effort to participate in the study. Sixty percent ‘strongly agreed’ that the study increased their interest in learning to feed their child in healthy ways.

Conclusion: Home-based MI interventions may be an effective strategy for modifying maternal food parenting practices in low-income populations. Most mothers found that watching themselves was “eye-opening” and applicable to their own lives.
Introduction

Childhood obesity remains a serious public health concern in the United States. Although recent nationwide data suggest that obesity prevalence in preschool-aged children (aged 2 to 5-years) has declined, obesity continues to be disproportionately high among low-income preschool-aged children. In 2011-2012, nearly 23% of all preschool-aged children were overweight (14.4%) or obese (8.4%) nationwide. In contrast, more than 30% of low-income preschool-aged children were overweight (16.0%) or obese (14.4%) nationwide during the same time period. The high prevalence of childhood obesity is a serious public health concern due to increased risk for obesity-related comorbidities including hypertension, type 2 diabetes mellitus, and psychosocial challenges. Moreover, overweight and obese children are more likely to become obese adults, subsequently influencing health across the lifespan.

The etiology of overweight and obesity in early childhood is complex, resulting from genetic and environmental factors. Unlike genetics, environmental factors are potentially modifiable making these factors important targets for early childhood overweight and obesity prevention efforts. One such environmental factor, the family food environment, plays an important role in shaping a child’s food preferences, eating behaviors, and weight status early in life. The family food environment includes parental factors (e.g., nutrition knowledge, food availability, and child feeding) as well as a child’s preferences and behaviors. Although the roles and responsibilities of parents are shifting, in most households, mothers continue to be responsible for maintaining the family food environment including meal planning,
grocery shopping, and child feeding. Therefore, including mothers in early childhood obesity prevention interventions targeting the family food environment is essential.

Mothers use specific strategies, or food parenting practices, to maintain or alter a child’s food intake. Broadly, these food parenting practices may hinder or support the development of a child’s food preferences and healthy eating behaviors early in life. Examples of food parenting practices that hinder the development of healthy eating behaviors include ‘pressure to eat’ (i.e., pressuring a child to consume more food without regard for their hunger and satiety cues), and food-based ‘threats and bribes’ (i.e., using a favored food as threat or bribe). In contrast, ‘involvement’ (i.e., involving a child in meal planning and preparation), ‘food availability’ (i.e., making a variety of healthy foods available in the home), and ‘modeling’ (i.e., modeling the consumption of healthy foods) support the development of healthy eating behaviors. Moreover, food parenting practices are potentially modifiable, making these practices ideal targets for interventions.

Coercive controlling food parenting practices, like ‘pressure to eat’ and ‘threats and bribes’, undermine a child’s ability to autonomously regulate food intake based on hunger and satiety cues, and hinder the development of healthy eating behaviors. Some studies have associated the use of ‘pressure to eat’ with reductions in a child’s weight status. However, other studies have associated ‘pressure to eat’ with food avoidance, a reduction in a child’s ability to self-regulate food intake based hunger and satiety cues, and reductions in the intake of healthy foods. The use of food-based ‘threats and bribes’ (e.g., “You can have your favorite dessert if you finish your dinner.”) have been associated with eating in the absence of hunger and an increased
desire for the food used as a bribe, which may contribute to excess energy intake. In contrast, food parenting practices that provide positive structure and support a child’s autonomy, like ‘involvement’ and ‘modeling’ support the development of autonomous regulation and healthy eating behaviors. For example, parents using ‘involvement’ include the child in meal planning and preparation, giving the child a role in the decision-making process. Parental ‘modeling’ that includes enthusiastically eating healthy foods with a child has been associated with an increase in a child’s fruit and vegetable intake. In addition, making a variety of healthy foods (e.g., fruits and vegetables) available in the home has been associated with an increase in a child’s intake of those foods. Given that these food parenting practices hinder or support the development of a child’s food preferences, eating behaviors, and subsequent weight status, interventions targeting these practices are important.

Although some studies have incorporated education on “best feeding practices” within multi-component obesity prevention interventions, few studies have directly attempted to modify food parenting practices. Moreover, few studies have used a theoretical framework to understand how food parenting practices lead to food preferences and eating behaviors in preschool-aged children. As a theory of human motivation, self-determination theory (SDT) provides a framework for how food parenting practices may lead to eating behaviors associated with increased weight status (i.e., overweight and obesity) in children. Broadly, SDT describes the propensity for autonomous psychological and behavioral regulation based on intrinsic (i.e., engaging in a task because it is interesting or enjoyable) or extrinsic (i.e., engaging in a task due to external influences) motivation. Aspects of a child’s
environment, including food parenting practices, may hinder or support autonomous psychological and behavioral regulation. For example, coercive controlling food parenting practices are associated with a reduction in child’s ability to autonomously regulate food intake based on hunger and satiety cues. This reduction in a child’s ability to autonomously regulate food intake is associated with unhealthy eating behaviors as well as overweight and obesity. Although SDT provides a framework, it lacks a goal-oriented approach for modifying a mother’s food parenting practices. As a collaborative, goal-oriented approach to behavior change, motivational interviewing (MI) may be a feasible approach to enhance a mother’s readiness and motivation to modify and improve her food parenting practices.

Given the evidence that food parenting practices influence a child’s food preferences, eating behaviors, and subsequent weight status early in life, the purpose of this study was to examine the feasibility and acceptability of a novel home-based intervention to modify and improve maternal food parenting practices. The home-based MI intervention used an evening meal video recording of the mother and child to generate a discussion regarding her food parenting practices. The primary aim was to assess the feasibility of recruiting low-income mothers and their preschool-aged children, and assess retention at follow-up. The secondary aim was to assess the mother’s satisfaction with this home-based intervention. Lastly, the exploratory aim was to examine the impact of the intervention on food parenting practices in the context of a non-experimental, pretest-posttest study design. We hypothesized that mothers would report improvements in food parenting practices following the intervention.
Methods

Participant Recruitment

Prior to participant recruitment, a meeting with staff from the Women, Infants and Children (WIC) office in Westerly, Rhode Island, was organized to explain the current study and to seek help with participant recruitment. Participant recruitment occurred between August 2015 and January 2016, at the WIC office. During this period, office staff provided interested participants with a brief description (Appendix F) of the study. Recruitment flyers (Appendix E) were also posted in the office waiting area. Interested participants were either introduced to the researcher in the office waiting area following their WIC appointment, or given contact information to call the researcher at their convenience. Participants who had time to complete the 10-minute screening questionnaire (Appendix G) were screened for eligibility. Participants who lacked time to complete the screening questionnaire in-person were screened over the phone at a more convenient time.

Eligibility criteria included mothers (≥18 years of age) with a biological or adopted child between 2 to 5-years of age, who primarily resided in the mother’s home. Mothers also needed to speak and read English, eat a minimum of three evening meals per week with her child, and be willing to have an evening meal video recorded in the home. Mothers were ineligible if their child had a diagnosed feeding disorder, dietary restrictions or medical condition that impacts how she feeds her child. Eligible mothers were asked to provide informed consent (Appendix C), and written permission for their child (Appendix D).
Procedures

Figure 1 presents an overview of the study. Eligible participants completed three home-based sessions. The baseline session (session 1) was conducted with the mother and child during an evening meal at a convenient time for the mother. The researcher arrived 10-minutes before the evening meal to provide information on the recording the evening meal, including how to operate the Sony Handycam HD AVCHD (Sony Corporation of America, New York, NY). The researcher positioned the video camera to capture the mother (i.e., mother’s upper torso, plate and drink) and the target child (i.e., child’s upper torso, plate and drink). The mother was instructed to maintain typical meal functioning, and to record until the target child finished his/her meal. Based on previous research, to support typical meal functioning the researcher left the home during the meal and returned 30-minutes later to administer the baseline assessments. The Demographics Questionnaire (Appendix H) and Comprehensive Feeding Practices Questionnaire (CFPQ) (Appendix J) were administered, and mother and child heights and weights were measured using standardized procedures (Appendix I). Participants received a $30.00 grocery store gift card upon completion of this session.

Prior to the feedback session (session 2), the evening meal recordings were coded and transferred to a laptop, which was brought to the home during the feedback session. The feedback session was conducted with the mother, and included a 60-minute semiscripted MI intervention that was audio-recorded (Appendix L). During the intervention, the mother was shown the coded evening meal video recording on a laptop. The coded evening meal recording was used to generate discussions on food parenting practices, and facilitate the development of a plan to help the mother modify and
improve a food parenting practice of her choosing. Based on previous studies, the feedback session targeted five food parenting practices from the CFPQ: ‘food as reward’ (more recently termed food-based ‘threats and bribes’), ‘environmental’ (more recently termed ‘food availability’), ‘involvement’, ‘modeling’, and ‘pressure’. Participants received a $30.00 grocery store gift card upon completion of this session. The CFPQ and Satisfaction Questionnaire (Appendix N) were administered at follow-up (session 3), and participants received a $20.00 grocery store gift card upon completion of this session. The three home-based sessions occurred over a six-week period, and were scheduled at a convenient time for the mother and her family. An experienced undergraduate research assistant provided complimentary childcare, as needed, during the sessions. The University of Rhode Island Institutional Review Board approved all study procedures.

**Measures**

**Demographics.** This researcher-administered questionnaire captured the mothers’ reported age, race/ethnicity, marital status, employment, total annual household income, and education level. Mothers also reported age, sex, and race/ethnicity for their child. To assess typical evening meal functioning mothers were asked, “Was this a typical meal for you and your child?” This item was scored on a scale from 1 (not at all typical) to 4 (very typical), with higher scores indicating the evening meal was more typical.

**Food Parenting Practices.** The Comprehensive Feeding Practices Questionnaire (CFPQ) was used to assess the mother’s food parenting practices at baseline and follow-up. The CFPQ is a 49-item validated measure with good psychometric
properties in children 2 to 8-years of age.\textsuperscript{35} The measure is scored using two response scales. For items 1 – 13, mothers indicate the frequency that they use each feeding practice on a 5-point Likert scale from 1 (never) to 5 (always). For items 14 – 49, mothers indicate their level of agreement on a 5-point Likert scale from 1 (disagree) to 5 (agree). Higher subscale scores indicate greater use of that food parenting practice. For the purposes of this study, only five of the twelve subscales of the CFPQ were examined (i.e., ‘food as reward’, ‘environmental’, ‘involvement’, ‘modeling’, and ‘pressure’). Mean scores were calculated for the five subscales, and changes in mean scores were assessed pretest-posttest.

\textit{Anthropometrics.} Mother and child heights and weights were measured at baseline. Height was measured in duplicate to the nearest 0.25 inch using a portable stadiometer (Seca 213; Seca, Hanover, MD). Weight was measured in duplicate to the nearest 0.1 pound using a calibrated digital scale (Seca 813; Seca, Hanover, MD). Mothers and children were instructed to remove heavy clothing and shoes prior to measurement. Maternal BMI (kg/m\textsuperscript{2}) was calculated using the average of the two height and weight measurements, and then classified into the following categories: underweight (<18.5), normal weight (18.5 to 24.9), overweight (25.0 to 29.9) and obese (≥30.0).\textsuperscript{36} Child BMI (kg/m\textsuperscript{2}) was calculated using the average of the two height and weight measurements, and then plotted on the appropriate BMI-for-age sex-specific growth chart. Growth chart percentiles were classified into the following categories: underweight (< 5\textsuperscript{th} percentile), normal weight (5\textsuperscript{th} to 84\textsuperscript{th} percentile), overweight (85\textsuperscript{th} to 94\textsuperscript{th} percentile) and obese (≥95\textsuperscript{th} percentile).\textsuperscript{37}
Family Mealtime Coding System (FMCS). The FMCS was used to code the frequency of the mother’s use of controlling food parenting practices during the evening meal video recording (Appendix K). The FMCS was developed to assess four controlling food parenting practices: pressure (i.e., verbal encouragement to consume more food), physical prompts (i.e., physical encouragement to consume food), restriction (i.e., limiting consumption of foods), and use of incentives or conditions (i.e., incentives to increase food consumption). The frequency and time of the observed controlling food parenting practices were coded for each evening meal video recording. Coding started once food arrived at the table and stopped when the meal ended or after 20-minutes. Only the mother’s food parenting practices with the target child were coded. The evening meal video recording was coded prior to the feedback session, and the video recording was subsequently shown to the mother during the feedback session.

Satisfaction Questionnaire. Mothers completed a 6-item satisfaction questionnaire that included, “It was worth your effort to participate in this study.” and “This session increased your interest in learning to feed your child in healthy ways.” (Appendix N). Four items were scored on a 4-point Likert scale from 1 (disagree strongly) to 4 (agree strongly), with higher scores indicating greater agreement. In addition, participants were asked to respond to two open-ended items on what they liked about the study, and what they would change for future studies.

Motivational Interviewing Treatment Integrity Code 3.1.1 (MITI 3.1.1). The MITI 3.1.1 is a frequently used behavioral coding instrument for assessing MI fidelity (Appendix M). Global scores capture the rater’s overall impression of the session.
across five dimensions (i.e., evocation, collaboration, direction, autonomy/support and empathy). The five dimensions are individually scored on a 5-point Likert scale from 1 (low) to 5 (high). Behavior counts capture the frequency of interviewer behaviors in five categories (i.e., giving information, MI adherent, MI non-adherent, questions, and reflections). Given that behavior counts capture the frequency of interviewer behaviors during the session, total scores can vary by session. To assess MI fidelity, global scores and behavior counts are converted to summary scores, which are used to categorize the interviewer’s adherence into one of two categories: beginning proficient or competent. A trained primary rater used the MITI 3.1.1 to code randomly selected 20-minute segments of five audio-recorded feedback sessions conducted during the study. A second trained rater used the MITI 3.1.1 to double-code two of the five selected sessions.

Data Analysis

Descriptive statistics for study variables were calculated including means and standard deviations for continuous variables (e.g., age) and frequencies and percentages for categorical variables (e.g., race/ethnicity). The Shapiro-Wilk’s test was used to assess normality. Paired samples t-tests were used to determine if there was a statistically significant change in the mean scores of the five CFPQ subscales assessed at baseline and follow-up. Significance was set at $p < 0.05$. Statistical analyses were performed using SPSS version 23.0 (SPSS Inc., Chicago, IL, USA).
Results

Recruitment and Retention

A convenience sample of 25 mother-child dyads were approached during the recruitment period, of these, 15 (60%) completed the screening questionnaire, and were enrolled in the study. The remaining 10 mother-child dyads were unable to complete the screening process following their WIC appointments, and were unable to be contacted by phone after five attempts. Of the 15 mother-child dyads enrolled in the study, all of them completed the three home-based study sessions and were included in data final analysis.

Participant Characteristics

Baseline characteristics of the mother-child dyads are presented in Table 1. Mothers enrolled in the study had a mean age of 32.3 years (SD = 4.6), and the majority were White (86.7%). Just under half (46.6%) of the mothers were separated or divorced, 26.7% were single, and the remaining 26.7% were married. The majority were unemployed (60.0%), and more than half (60.0%) reported an annual household income of $20,000 or less. Most mothers reported having a high school diploma or GED (46.7%), and 40.0% reported some college or an associate’s degree. Just under half of the mothers were obese (46.7%), 20.0% were overweight, and 26.7% were of normal weight. Children enrolled in the study had a mean age of 3.2 years (SD = 0.9), 73.3% were male, and the majority were White (66.7%). About half of the children were of normal weight (53.3%), and the remaining children were overweight or obese (33.3% and 13.3%, respectively). The majority of mothers reported that the evening
meal was ‘very typical’ (53.3%) or ‘typical’ (13.3%), and 33.4% reported that the evening meal was ‘somewhat typical.’

Food Parenting Practices

Paired-samples t-tests were used to determine whether there was a statistically significant difference in each of the five CFPQ subscales assessed at baseline and follow-up (Table 2). The assumption of normality was not violated, as assessed by the Shapiro-Wilk's test ($p = 0.32$). Following the intervention, mothers reported a statistically significant decrease in the use of ‘food as reward’ (2.4 vs. 1.9, $p = 0.03$). Mothers also reported an increase in the use of the ‘environmental’ food parenting practice that trended towards significance (3.9 vs. 4.3, $p = 0.054$). Although there were increases in the mother’s use of ‘involvement’ (3.3 vs. 3.8, $p = 0.60$) and ‘modeling’ (4.1 vs. 4.4, $p = 0.10$), these increases were not significant. There was a decrease in the mother’s use of ‘pressure to eat’, though the decrease was not significant (3.2 vs. 2.9, $p = 0.20$).

Participant Satisfaction

Most mothers ‘strongly agreed’ (93.3%) that it was worth their effort to participate. All mothers ‘strongly agreed’ (60.0%) or ‘somewhat agreed’ (40.0%) that this home-based intervention increased their interest in learning to feed their child in healthy ways. A mother stated, “I liked talking with someone about feeding my kids. I guess, people think that feeding kids is easy and all moms should know how to do it but it's not always easy.” When responding to the open-ended question on what they liked about the study, several mothers indicated they liked the watching the evening meal video recording. One mother stated, “Seeing the video and how I reacted was
eye-opening. I liked getting information that I can apply to my own life and talking about what might work for my family.” Another mother stated, “I liked that you come to me and take the video. Then you review the video and give suggestions. This is a good program and good way to help moms.” A mother stated, “I liked that I could ask questions and you’d take the time to explain things to me.” When responding to the open-ended question on what they would change about the study, mothers suggested including more sessions and recording a second evening meal after the intervention to assess changes in food parenting practices.

Motivational Interviewing Fidelity.

Thirty-three percent (n = 5) of the audio-recorded feedback sessions were randomly selected for MITI 3.1.1 coding. Mean summary scores for the primary rater and recommended proficiencies are presented in Table 3. The mean summary score for global spirit (3.64, SD = 0.35) indicates beginning proficiency. Mean summary scores for reflection to question ratio (3.2, SD = 1.16), percent MI adherent (100), percent complex reflections (75.8, SD = 8.7), and percent open questions (97.6, SD = 5.36), indicate interviewer competence. An evaluation of the two sessions double-coded by the second trained rater and the primary rater had an intraclass correlation coefficient (ICC) of 0.72, indicating good interrater agreement.42

Discussion

This study examined the feasibility and acceptability of a novel home-based intervention designed to modify and improve the food parenting practices of low-income mothers with preschool-aged children. Results indicate that it is feasible to recruit mothers and their preschool-aged children, and that this study had high
retention rates when compared to other home-based interventions targeting low-income mothers.\textsuperscript{43} There was a statistically significant decrease in the use of ‘food as a reward’, and although it did not reach significance there was an increase the use of ‘environmental’ or providing a healthy home food environment. Mothers were satisfied with this brief home-based intervention and found the personalized feedback helpful and empowering. Currently more than 30\% of low-income preschool-aged children are overweight or obese nationwide.\textsuperscript{4} Within the small sample enrolled in this study, nearly half (46.6\%) of the low-income preschool-aged children were overweight or obese. The prevalence of overweight and obesity in this small sample further highlights the importance of interventions that target this population. Future interventions should test the efficacy of such an intervention with a larger and more diverse sample.

The retention for this study was high when compared to previous studies with low-income populations.\textsuperscript{43,44} There are several reasons for our high retention. First, based on previous studies, our study used several validated recruitment and retention strategies.\textsuperscript{44} These strategies included fully describing study goals and procedures during screening, providing financial incentives, maintaining contact throughout the study, and the short duration of the study.\textsuperscript{44,45} Second, to reduce potential barriers, all sessions were conducted in the mother’s home at a convenient time for the family, and complimentary childcare was provided. Lastly, our study established and maintained strong relationships with WIC office staff and administrators.

Previous research suggests that the food parenting practices of low-income mothers do not meet current recommendations.\textsuperscript{46} Therefore, the development of
effective interventions targeting the food parenting practices of low-income mothers is crucial. Interestingly, even with a small sample size (N = 15), there was a statistically significant decrease in the use of ‘food as reward’ following intervention. Given that some studies have associated the use of ‘food as reward’ with increases in a child’s weight status,\textsuperscript{47} this is an important finding. The mothers’ increase in providing a healthy home food environment (i.e., ‘environmental’) for their child is promising. Making a variety of healthy foods (e.g., fruits and vegetables) available in the home has been associated with an increase in a child’s intake of those foods.\textsuperscript{27} Although not statistically significant, mothers reported a decrease in the use of ‘pressure to eat’, and an increase in the use of ‘involvement’ and ‘modeling’ following the intervention. All five food parenting practices targeted in the home-based intervention changed in the posited direction, suggesting that these practices can be modified using a brief home-based intervention.

There are three possible explanations for the success of this home-based intervention. First, the intervention used SDT as a theoretical framework for how food-parenting practices lead to eating behaviors associated with a child’s weight status. This framework posits that a mother’s food parenting practices may hinder or support autonomous psychological and behavioral regulation, including a child’s ability to autonomously regulate food intake.\textsuperscript{32,33} Coercive controlling food parenting practices hinder a child’s ability to autonomously regulate food intake, and are associated with an increase in a child’s weight status. Therefore, our intervention was designed to decrease the use of these practices, and increase the use of positive food parenting practices that support a child’s ability to autonomously regulate food intake.
Second, showing the evening meal video recording to the mother during the intervention generated a detail-rich discussion regarding her food parenting practices. This detail-rich discussion and the use of MI to increase her readiness and motivation to modify and improve her food parenting practices may have contributed to the success of this study. Lastly, mothers reported a high degree of satisfaction with the intervention. Most mothers reported that it was worth their effort to participate in the study, and that the intervention increased their interest in feeding their child in healthy ways. In addition, mothers reported that watching the meal video recording was “eye-opening” and the intervention was a “good way to help moms.” These findings suggest that a home-based MI intervention using an evening meal video recording as feedback may be a successful strategy for modifying and improving food parenting practices.

This study had a number of limitations. Our study did not include a control group, and therefore reported changes in food parenting practices may have been from factors other than the intervention. Given that this was a feasibility study, it was not adequately powered to detect mean differences in food parenting practices. Despite this, however we did see a significant decrease in the mother’s use of ‘food as reward.’ In addition, the use of a non-experimental, pretest-posttest design poses threats to internal validity due to repeated testing. In addition, our study did not collect information on the mother and child’s diet quality, and therefore it is unknown whether they were meeting current recommendations. Despite these limitations, our study has several strengths. Our study targeted low-income populations by recruiting directly from WIC. To our knowledge, this is the first study to use an evening meal
video recording to provide the mothers of preschool-aged children with feedback on their food parenting practices. Moreover, although providing childcare was an added cost, reducing barriers to participation may have improved participant retention and satisfaction.

**Conclusion**

A mother’s food parenting practices play an important role in the development of a child’s eating behaviors, and subsequent weight status early in life. These findings illustrate the important role of home-based interventions that extend beyond providing information on food parenting practices, and offer mothers an “eye-opening” window into how they feed their child and provide support for modifying and improving these practices. Moreover, this study found that mothers are interested in learning and using healthy food parenting practices to feed their children. Given the findings from this study, future interventions may benefit from using a meal video recording to generate discussions on food parenting practices, and provide mothers with support to modify and improve these practices. Future studies may benefit from collecting information on the mother and child’s diet quality, and expanding to include different racial/ethnic populations who are at increased risk for childhood overweight and obesity.
References


4. Centers for Disease Control and Prevention (CDC), Division of Nutrition, Physical Activity and Obesity. Pediatric Nutrition Surveillance System (PedNSS), Table 6D; 2011.


40. Moyers T, Martin T, Manuel J, Miller W, Ernst D. Revised Global Scales: Motivational Interviewing Treatment Integrity 3.1.1 (MITI 3.1.1); 2010.


Table 1: Demographic characteristics of mother-child dyads (N = 15).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Age (yrs) (mean±SD)</td>
<td>32.3±4.6</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14 (93.3)</td>
</tr>
<tr>
<td>Yes</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>13 (86.7)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>American Indian</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Multiracial</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Married/living together</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>7 (46.6)</td>
</tr>
<tr>
<td>Single</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>Employment Status</td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>2 (13.3)</td>
</tr>
<tr>
<td>Part-time</td>
<td>4 (26.6)</td>
</tr>
<tr>
<td>Not employed</td>
<td>9 (60.0)</td>
</tr>
<tr>
<td>Household Income</td>
<td></td>
</tr>
<tr>
<td>&lt; 20K</td>
<td>9 (60.0)</td>
</tr>
<tr>
<td>20K – 49,999K</td>
<td>5 (33.3)</td>
</tr>
<tr>
<td>50K – 59,999K</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
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<tr>
<td>High school diploma/GED</td>
<td>7 (46.7)</td>
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<tr>
<td>Some college or associate’s degree</td>
<td>6 (40.0)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>2 (13.3)</td>
</tr>
<tr>
<td>BMI Classifications</td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Normal weight</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>Overweight</td>
<td>3 (20.0)</td>
</tr>
<tr>
<td>Obese</td>
<td>7 (46.7)</td>
</tr>
</tbody>
</table>
Table 1: Demographic characteristics of mother-child dyads (N = 15).

<table>
<thead>
<tr>
<th>Child Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs) (mean±SD)</td>
<td>3.2±0.9</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11 (73.3)</td>
</tr>
<tr>
<td>Female</td>
<td>4 (26.7)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>12 (80.0)</td>
</tr>
<tr>
<td>Yes</td>
<td>3 (20.0)</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>10 (66.7)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>American Indian</td>
<td>1 (6.7)</td>
</tr>
<tr>
<td>Multiracial</td>
<td>3 (20.0)</td>
</tr>
<tr>
<td>BMI Classifications</td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Normal weight</td>
<td>8 (53.3)</td>
</tr>
<tr>
<td>Overweight</td>
<td>5 (33.3)</td>
</tr>
<tr>
<td>Obese</td>
<td>2 (13.3)</td>
</tr>
</tbody>
</table>
Table 2: Comparison of mean Comprehensive Feeding Practices Questionnaire (CFPQ) subscale scores at baseline and follow-up.\textsuperscript{a} (n = 15)

<table>
<thead>
<tr>
<th>CFPQ Subscales\textsuperscript{b} (number of items)</th>
<th>Baseline Mean (SD)</th>
<th>Follow-up Mean (SD)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food as Reward (3)</td>
<td>2.4 (1.2)</td>
<td>1.9 (1.1)</td>
<td>0.03</td>
</tr>
<tr>
<td>Environmental (4)</td>
<td>3.9 (0.9)</td>
<td>4.3 (0.6)</td>
<td>0.05</td>
</tr>
<tr>
<td>Involvement (3)</td>
<td>3.3 (1.1)</td>
<td>3.8 (0.8)</td>
<td>0.06</td>
</tr>
<tr>
<td>Modeling (4)</td>
<td>4.1 (0.9)</td>
<td>4.4 (0.7)</td>
<td>0.10</td>
</tr>
<tr>
<td>Pressure (4)</td>
<td>3.2 (1.1)</td>
<td>2.9 (0.7)</td>
<td>0.20</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Follow-up occurred two-weeks after the feedback session targeting maternal food parenting practices.

\textsuperscript{b} Subscales scored on a 5-point Likert scale [1 (never) – 5 (always) and 1 (disagree) to 5 (agree)].
Table 3: Interviewer’s motivational interviewing proficiency scores compared to recommended proficiency scores using the MITI 3.1.1.

<table>
<thead>
<tr>
<th>MITI Domain</th>
<th>MITI Score&lt;sup&gt;b&lt;/sup&gt;</th>
<th>MITI Score Proficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Beginning</td>
</tr>
<tr>
<td>Global Spirit&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.64 (0.35)</td>
<td>3.5</td>
</tr>
<tr>
<td>Reflection to Question Ratio&lt;sup&gt;d&lt;/sup&gt;</td>
<td>3.2 (1.16)</td>
<td>1.0</td>
</tr>
<tr>
<td>% MI Adherent&lt;sup&gt;e&lt;/sup&gt;</td>
<td>100 (0.00)</td>
<td>90%</td>
</tr>
<tr>
<td>% Complex Reflections&lt;sup&gt;f&lt;/sup&gt;</td>
<td>75.8 (8.70)</td>
<td>40%</td>
</tr>
<tr>
<td>% Open Questions&lt;sup&gt;g&lt;/sup&gt;</td>
<td>97.6 (5.36)</td>
<td>50%</td>
</tr>
</tbody>
</table>

<sup>a</sup> MITI 3.1.1 = Motivational Interviewing Treatment Integrity Code 3.1.1.
<sup>b</sup> MITI was used by primary rater to code 20-minute segments of 5 randomly selected sessions.
<sup>c</sup> Global Spirit = (Evocation + Collaboration + Autonomy) / 3.
<sup>d</sup> Reflection to Question Ratio = Total Reflections / Total Questions.
<sup>e</sup> % MI Adherent = MI Adherent / (MI Adherent + MI Non-adherent) x 100.
<sup>f</sup> % Complex Reflections = (Complex Reflections / Total Reflections) x 100.
<sup>g</sup> % Open Questions = (Open Questions / Total Questions) x 100.
Figure 1: Study overview.
I. Introduction

In the United States (US), more than 20% of preschool-aged children (aged 2 to 5-years) are overweight or obese.\textsuperscript{1,2} The prevalence of childhood overweight and obesity is a serious public health concern due to increased risk for obesity-related comorbidities including hypertension, type 2 diabetes mellitus, and psychosocial challenges.\textsuperscript{3,4} In addition, there is strong evidence that overweight and obese children are more likely to become obese adults subsequently influencing health across the lifespan.\textsuperscript{5–7} Although recent nationwide data suggest childhood obesity prevalence in some populations has declined or stabilized,\textsuperscript{1,2} childhood obesity prevalence continues to be disproportionately high in low-income\textsuperscript{8,9} and some minority populations.\textsuperscript{1,2} The prevalence of childhood overweight and obesity underscores the importance of developing effective childhood obesity prevention strategies.

The etiology of childhood obesity is complex resulting from multiple interacting factors, including genetic and environmental factors.\textsuperscript{10,11} This review will focus on the environmental factors associated with childhood obesity, given these factors play an important role in shaping a child’s eating behaviors, and subsequent weight status.\textsuperscript{12–15} The family food environment plays an important role in the development of a child’s food preferences and eating behaviors early in life.\textsuperscript{12–15} The family food environment includes parental factors (e.g., nutrition knowledge, food availability, and child feeding) as well as a child’s preferences and behaviors.\textsuperscript{13,15} Although the roles and responsibilities of parents are shifting,\textsuperscript{16} in most households mothers are responsible
for maintaining the family food environment including meal planning, grocery shopping, and child feeding.\textsuperscript{14} Mothers use specific practices (i.e., food parenting practices) to maintain or alter a child’s food intake.\textsuperscript{14,17} Food parenting practices are potentially modifiable making these practices important targets for childhood obesity prevention efforts.\textsuperscript{14,17} Moreover, given that food parenting practices shape a child’s eating behaviors early in life,\textsuperscript{13,15} the development of parent-based interventions to reduce childhood overweight and obesity are critical.

II. Childhood Obesity – A Public Health Concern

The prevalence of obesity among preschool-aged children has nearly tripled in the past three decades.\textsuperscript{18} The prevalence of obesity among preschool-aged children increased from 5.0\% in 1976-1980 to 12.1\% in 2009-2010.\textsuperscript{18} More recently, the prevalence of obesity in preschool-aged children declined from 12.1\% in 2009-2010 to 8.4\% in 2011-2012,\textsuperscript{1,18} however rates remain high. In addition, overweight children often track towards obesity,\textsuperscript{5–7} placing more children at risk for obesity. Furthermore, overweight and obesity prevalence continues to be disproportionately high in low-income\textsuperscript{8,9} and some minority populations.\textsuperscript{1,2}

The high prevalence of overweight and obesity in preschool-aged children underscores the importance of exploring this serious public health concern. To explore this serious public health concern, this review covers the following topics: 1) the definitions and etiology of childhood overweight and obesity, 2) disparities in overweight and obesity prevalence in preschool-aged children, 3) factors that shape a child’s eating behaviors and subsequent weight status, and 4) interventions aimed at modifying factors that influence a child’s eating behaviors and weight status.
Definition of Overweight and Obesity

Overweight and obesity are the result of a sustained calorie imbalance (i.e., calorie intake in excess of metabolic needs). The use of standardized terms and reference values are important when defining and assessing overweight and obesity. Overweight and obesity are defined as “weight in excess of a weight standard and excess body fatness”, respectively. Direct measurement methods (e.g., hyodensitometry and dual x-ray absorptiometry) are the gold standard for assessing body fat. However, direct measurement methods are often cost prohibitive and time-consuming, and therefore are not commonly used. As a cost effective and timesaving method, body mass index (BMI) is commonly used to estimate body fatness. Body mass index is calculated as weight in kilograms divided by height in meters squared (weight[kg]/height[m]²) and describes weight adjusted for height. Although BMI is commonly used to assess body fatness, it is not a direct measurement of body fat. For example, BMI does not distinguish between body fat and fat-free mass (e.g., muscle tissue or bone), and therefore must be interpreted appropriately. However, BMI closely correlates with direct measurement methods, and therefore is used as a proxy measurement to identify those at greater risk for comorbidities associated with excess body fatness (i.e., overweight and obesity).

In the US, the Centers for Disease Control and Prevention (CDC) defines overweight as a BMI greater than or equal to the 85th percentile but less than the 95th percentile, and obesity as greater than the 95th percentile for children and adolescents ages 2 through 19-years. Due to the rapid growth and development that occurs during childhood and adolescence as well as differences in growth between sexes, sex-
and age-specific percentiles are used to interpret BMI values.\textsuperscript{20–22} This is in contrast to specific reference categories used to interpret BMI values for adults.\textsuperscript{22} For children and adolescents, BMI is compared to sex- and age-specific reference values, known as BMI-for-age growth charts.\textsuperscript{20,21} The BMI-for-age growth charts provide a percentile to assess if weight is appropriate for height at a given age for a specific sex.\textsuperscript{20,21}

\textbf{Comorbidities Associated with Childhood Obesity}

The high prevalence of childhood overweight and obesity is a serious public health concern due to the increased risk for obesity-related comorbidities.\textsuperscript{3,4} Obesity-related comorbidities include short term and long term health and psychosocial consequences making prevention efforts early in life important.\textsuperscript{3,4} Obese children are at increased risk for short term obesity-related comorbidities including hypertension\textsuperscript{23}, type 2 diabetes mellitus\textsuperscript{24}, asthma\textsuperscript{25}, sleep apnea\textsuperscript{26}, and dental caries\textsuperscript{27}. In addition, obese children are at increased risk for long term obesity-related comorbidities including dyslipidemia\textsuperscript{24,28} and some cancers\textsuperscript{5,29}. Moreover, obese children are at increased risk for psychosocial challenges including poor self-esteem, depression, discrimination and reduced quality of life.\textsuperscript{3} Furthermore, when compared to their non-obese counterparts, overweight and obese children are more likely to become obese adults subsequently influencing health across the lifespan.\textsuperscript{5–7} Obesity-related comorbidities make childhood overweight and obesity prevention efforts early in life important.

\textbf{Disparities in Childhood Obesity Prevalence}

Although childhood obesity prevalence in some populations has declined or stabilized, childhood obesity prevalence continues to be disproportionately high in low-income preschool-aged children.\textsuperscript{8,9} In 2011-2012, 14.4\% of low-income
preschool-aged children were obese and 16.0% were overweight nationwide.\textsuperscript{30} Moreover, in 2011-2012, 16.6% of low-income preschool-aged children were obese and 17.1% were overweight in Rhode Island\textsuperscript{30}, exceeding nationwide averages. Both nationwide and state-specific childhood obesity prevalence in low-income preschool-aged children contrasts with nationwide data for all preschool-aged children, where 8.4% were obese and 14.4% were overweight during the same time period.\textsuperscript{1}

Childhood obesity prevalence is also disproportionately high in some low-income preschool-aged minority populations.\textsuperscript{1,2} In 2011-2012, nationwide the prevalence of obesity was higher among low-income preschool-aged American Indian/Alaska Native (20.1%), Hispanic (17.2%), and children from multiple races (15.9%) when compared to their non-Hispanic, white (15.6%) counterparts.\textsuperscript{31} In addition, nationwide the prevalence of overweight was higher among low-income preschool-aged American Indian/Alaska Native (20.8%), Hispanic (17.5%), and children from multiple races (13.0%) when compared to their non-Hispanic, white (12.1%) counterparts during the same time period.\textsuperscript{31} These data suggest that income and racial/ethnic disparities in childhood overweight and obesity prevalence begin early in life, underscoring the importance of exploring childhood obesity prevention strategies in preschool-aged children. Due to these disparities, the National Heart, Lung, and Blood Institute Working Group has recommended that future research include populations at increased risk for childhood obesity, including low-income and racially/ethnically diverse populations.\textsuperscript{32}
Etiology of Childhood Obesity

The etiology of childhood obesity is complex resulting from multiple interacting factors, including genetic and environmental factors.\textsuperscript{10,11} Recent advances in the understanding of the genetic factors associated with a predisposition for obesity are important.\textsuperscript{10,33} In addition, some research suggests that the genetic factors associated with a predisposition for obesity are strongly influenced by environmental factors.\textsuperscript{33} Although advances in the understanding of the genetic factors associated with obesity are important these factors are not modifiable, and therefore are rarely targets for childhood obesity prevention efforts. In contrast, environmental factors are often modifiable making these factors important targets for childhood obesity prevention efforts.\textsuperscript{13,15} This review focuses on aspects of the home environment or the family food environment that are associated with an increase risk for childhood overweight and obesity.

The Family Food Environment

The family food environment plays an important role in the development of a child’s food preferences, eating behaviors, and subsequent weight status early in life.\textsuperscript{12–15} The family food environment includes parental factors (e.g., nutrition knowledge, food availability, and child feeding) as well as a child’s preferences and behaviors.\textsuperscript{13,15} These parental factors may influence a child’s food preferences and eating behaviors.\textsuperscript{34,35} For example, mothers with higher nutrition knowledge have been shown to offer their children more fruits and vegetables, when compared with mothers with less nutrition knowledge.\textsuperscript{34,35} Offering fruit and vegetables during meals and
snacks increases the likelihood of the child eating these foods, and therefore support the development of healthy food preferences and eating behaviors.

**Food Parenting Practices**

Mothers use specific strategies, or food parenting practices, to maintain or alter a child’s food intake. These food parenting practices help shape a child’s food preferences, eating behaviors, and subsequent weight status. A child’s food preferences and eating behaviors develop early in life, and persist across the lifespan making the development of healthy eating behaviors early in life crucial. Therefore, targeting maternal food parenting practices may support the development of healthy eating behaviors in preschool-aged children.

**Inconsistent Terminology and Definitions**

The literature on child feeding has lacked consistent terminology and definitions, making comparisons across studies challenging. In 2016, Vaughn et al. developed a content map for food parenting practices recommending the use of consistent terminology and definitions to unify the field and facilitate comparisons across studies. Following the recommendation of the content map, this review uses the term food parenting practices to describe “behaviors or actions (intentional or unintentional) performed by parents for child-rearing purposes that influence their child’s attitudes, behaviors and beliefs” about food and eating behaviors. Broadly, the content map recommends the use of three constructs to describe these food parenting practices: coercive control, structure, and autonomy support.

Coercive control is defined as “parent’s pressure, intrusiveness, and dominance in relation to children’s feelings and thoughts, as well as their behaviors.” Although
extensive research has focused on the use of controlling food parenting practices,\textsuperscript{37–39} terminology and definitions have been inconsistent. These inconsistencies have made comparisons across studies challenging and have produced varying results.\textsuperscript{17,36} To facilitate the use of consistent terminology, the following subconstructs were included in the coercive control construct: restriction, pressure to eat, threats and bribes, and using food to control negative emotions.\textsuperscript{17}

Structure is defined as a “parent’s organization of children’s environment to facilitate children’s competence.”\textsuperscript{17} Food parenting practices that provide structure offer the child support and clarify expectations, although are not coercive nature.\textsuperscript{40} Therefore, food parenting practices that offer structure are important to the development of healthy eating behaviors in children. To facilitate the use of consistent terminology, the following subconstructs were included in the structure construct: rules and limits, limited/guided choices, monitoring, meal and snack routines, modeling, food availability, food accessibility, food preparation, and unstructured practices.\textsuperscript{17}

Lastly, autonomy support is “promoting psychological autonomy and encouragement of independence.”\textsuperscript{17} Food parenting practices that promote autonomy and encourage independence support the child in making age-appropriate decisions regarding food choices and eating behaviors. The following subconstructs were included in the autonomy support construct: nutrition education, child involvement, encouragement, praise, reasoning, and negotiation.\textsuperscript{17}

The current study targets five food parenting practices: pressure to eat (i.e., pressuring a child to consume more food without regard for hunger and satiety cues),
threats and bribes (i.e., using a favored food as threat or reward), modeling (i.e., role-modeling the consumption of healthy foods), food availability (i.e., making a variety of healthy foods available in the home), and child involvement (i.e., involving a child in meal planning and preparation). These food parenting practices are potentially modifiable, making them important targets for interventions.

Moreover, given that food parenting practices shape a child’s food preferences and eating behaviors early in life, it is important to understand how these practices impact a child’s weight status.

**Impacts of Food Parenting Practices**

Food parenting practices that provide structure and autonomy support encourage autonomous regulation of food intake based on internal hunger and satiety cues. A child’s ability to autonomously regulate food intake has been associated with healthy eating behaviors and optimal weight status. However, some maternal child feeding practices may reduce a child’s ability to autonomously regulate food intake. Coercive controlling food parenting practices, like ‘pressure to eat’ and ‘threats and bribes’, undermine a child’s ability to autonomously regulate food intake based on hunger and satiety cues, and hinder the development of healthy eating behaviors. Although one study associated the use of ‘pressure to eat’ with reductions in a child’s weight status, other studies have associated ‘pressure to eat’ with food avoidance, a reduction in a child’s ability to self-regulate food intake based on hunger and satiety cues, and reductions in the intake of healthy foods. The use of food-based ‘threats and bribes’ (e.g., “You can have your favorite dessert if you finish your dinner.”) have been associated with eating in the absence of hunger and
an increased desire for the food used as a bribe, which may contribute to excess energy intake.\textsuperscript{45} In contrast, food parenting practices that provide structure and support a child’s autonomy, like ‘involvement’ and ‘modeling’ support the development of autonomous regulation and healthy eating behaviors.\textsuperscript{17} For example, parents using ‘involvement’ include the child in meal planning and preparation, giving the child a role in the decision-making process.\textsuperscript{17} Parental ‘modeling’ that includes enthusiastically eating healthy foods with a child have been associated with an increase in a child’s fruit and vegetable intake.\textsuperscript{46} In addition, making a variety of healthy foods (e.g., fruits and vegetables) available has been associated with an increase in a child’s intake of those foods.\textsuperscript{46} Given that these food parenting practices hinder or support the development of a child’s food preferences, eating behaviors, and subsequent weight status,\textsuperscript{12–15} therefore interventions targeting these practices are important.

**Interventions Targeting Food Parenting Practices**

Although some studies have incorporated education on “best feeding practices” within multi-component obesity prevention interventions,\textsuperscript{47,48} few studies have directly attempted to modify food parenting practices.\textsuperscript{49,50} A follow-up from a randomized controlled trial (n=159) that included overweight children between the ages of 5 to 9-years and their parents examined the effects of three distinct treatment groups on food parenting practices at baseline, 6, 12 and 24-months post-intervention.\textsuperscript{49} Group assignments included: 1) a parent-only group including 10, 2-hour weekly didactic courses designed to decrease controlling feeding practices, 2) a child-only group focusing on increasing physical activity, and 3) a combination of the parent and child-
only groups. This study found significant reductions in the use of restriction (a coercive controlling food parenting practice), in the parent-only and combined groups but not in the child-only group at 24-months. This study supports the use of parent-focused interventions to modify coercive controlling food parenting practices, and the persistence of the modifications over time. However, the majority of participants were non-Hispanic white, with moderate socioeconomic status, therefore limiting generalizability in diverse, low-income populations. In addition, children ages 5 to 9-years and their parents were recruited for this study, therefore the effect with parents of preschool-aged children is unknown.

Assessing Food Parenting Practices

Several cross-sectional studies have used direct observation to assess mother-child meal interactions. The use of direct observation in a naturalistic setting (i.e., the home environment) offers a detail-rich window into the emotional climate of the meal, foods served during the meal, and food parenting practices used during the meal. Moreover, the use of direct observation is thought to have less response bias when compared to self-reported measures. Self-report measures may capture intended or idealized food parenting practices, and not what actually occurs during meals. Although previous studies have failed to find significant relationships between self-reported and observed food parenting practices, self-report measures are frequently used to assess food parenting practices.

Although the mother-child meal recordings offer a detail-rich window into what occurs during meals, to our knowledge, no studies have used the meal recording to provide feedback to the mother. Giving mothers an opportunity to view the meal
recording provides feedback and may facilitate a discussion on the emotional climate and food parenting practices used during the meal. Therefore, using mother-child meal recording to provide feedback to mothers regarding their food parenting practices may support behavior change.

III. A Theoretical Framework for Understanding Food Parenting Practices

Few studies have used a theoretical framework to understand how food parenting practices impact eating behaviors in children. As a theory of human motivation, self-determination theory (SDT) provides a framework for how maternal child feeding practices may lead to eating behaviors associated with increased weight status (i.e., overweight and obesity) in children.4,5

An Overview of Self-Determination Theory

Developed by clinical psychologists Richard Ryan and Edward Deci, SDT is a theory of human motivation.5 Fundamental to the theory is the human propensity towards autonomous psychological and behavioral regulation based on intrinsic (i.e., engaging in a task because it is interesting or enjoyable) or extrinsic (i.e., engaging in a task due to external influences) motivation.5 A child’s environment (e.g., their parents) can support or hinder autonomous psychological and behavioral regulation.4,5 For example, coercive controlling food parenting practices are associated with a reduction in child’s ability to autonomously regulate food intake based on hunger and satiety cues.12,14,17 This reduction in a child’s ability to autonomously regulate food intake is associated with unhealthy eating behaviors as well as overweight and obesity.12,14,17 In addition to supporting a child’s autonomy, it
is important for parents to provide structure during meals to encourage the development of healthy eating behaviors.\textsuperscript{14,56,57}

This extrinsic support is integrated by the child to a greater extent when the psychological needs for autonomy (e.g., the need for volition), competence (e.g., the need to feel capable) and relatedness (e.g., the need to feel supported by others) are reinforced by parents.\textsuperscript{54,55} Therefore, maternal food parenting practices that support a child’s ability to autonomously regulate food intake may support the development of healthy eating behaviors.\textsuperscript{54}

\textbf{IV. An Approach for Modifying Food Parenting Practices}

Self-determination theory provides a framework for how maternal food parenting practices lead to eating behaviors associated with overweight and obesity in children.\textsuperscript{54,55} However, it lacks a goal-orientated approach for modifying maternal food parenting practices. As a collaborative, goal-oriented style of communication, MI may enhance motivation and help establish goals for modifying maternal food parenting practices.\textsuperscript{58}

\textbf{An Overview of Motivational Interviewing}

Clinical psychologist William Miller originally developed MI to treat substance abuse disorders.\textsuperscript{59} Motivational interviewing was further developed by William Miller and Steven Rollnick, and in 1991 their original book, “Motivational Interviewing: Preparing People to Change Addictive Behavior” was published.\textsuperscript{60} Since then, MI has been adapted for numerous health-related behaviors including childhood obesity prevention and treatment.\textsuperscript{61,62} Broadly, MI is a collaborative, goal-oriented style of communication with particular attention to the language of change or “change talk”.\textsuperscript{58}
It is designed to strengthen personal motivation for and commitment to a specific goal by eliciting and exploring the person’s own reasons for change within an atmosphere of acceptance and compassion. This collaborative, goal-oriented style of communication actively engages a person in an exploration of the desires, motivation, and goals for behavior change. Moreover, the spirit, guiding principles, and techniques of MI have been used in both clinical and research settings to enhance motivation for behavior change.

**Motivational Interviewing – The Spirit, Guiding Principles, and Techniques**

The spirit or essence of MI is a “way of being” with a person that creates a partnership between the provider and person seeking support for behavior change. The underlying spirit of MI includes four qualities: collaboration, acceptance, compassion, and evocation. Collaboration creates a partnership that honors the person’s expertise and unique perspectives, which builds rapport and facilitates trust. The use of acceptance honors a person’s inherent worth and autonomy as well as acknowledges strengths and efforts made towards behavior change. In addition, compassion is a “deliberate commitment to pursue the welfare and best interest of others.” Lastly, evocation is the acknowledgement that the skills and motivation for change reside within the person seeking support for behavior change. The convergence of these four qualities is the underlying spirit of MI, which sets the tone for the behavior change partnership.

Building on the underlying spirit of MI, four guiding principles are used by providers to support behavior change: expressing empathy, developing discrepancy, supporting self-efficacy, and “rolling with resistance.” Expressing empathy through
reflective listening, allows providers to communicate acceptance and respect for a person’s point of view fostering collaboration. Providers develop discrepancy by exploring how a person’s values and goals align with current behaviors. By developing discrepancy, providers enhance a person’s desire or need for behavior change. Self-efficacy or a person’s belief in their ability to change is an important component of behavior change. By supporting and enhancing a person’s self-efficacy the belief in their ability to change and accomplish goals increases. Lastly, “rolling with resistance” or responding to resistance in a nonjudgmental, empathic manner reduces counterproductive arguments, and supports a person’s autonomy. These four principles serve as guide for the specific techniques used during an MI session to support behavior change.

The specific techniques a provider uses during an MI session are often referred to by the acronym OARS: open-ended questions, affirmations, reflections and summaries. The use of open-ended questions (i.e., questions that cannot be answered with a simple yes or no) provides more information on a person’s thoughts, feelings, and beliefs. Affirmations are statements used to support, encourage and bolster a person’s self-efficacy. In addition, reflections are statements used by the provider to check understanding (i.e., ensuring the provider understood what a person has said by repeating it back to them with or without added meaning). Lastly, summaries are often longer reflections used to tie together components of what the person has said during the MI session. Furthermore, providers use OARS to support behavior change by eliciting reasons for change and a person’s belief in their ability to change or “change talk”.

44
Motivational Interviewing – Individualized Feedback

Although not a specific MI technique, previous research suggests that providing individualized feedback in conjunction with MI may further enhance a person’s motivation for behavior change.\textsuperscript{58,64} Individualized feedback typically includes key information from a previous session or assessment.\textsuperscript{64} Using of individualized feedback offers a glimpse of current behaviors, and provides an opportunity to explore whether current behaviors are congruent with goals, values, and beliefs.

The current study used a mother-child meal recording, filmed during the baseline session, to provide individualized feedback to the mother. The Family Mealtime Coding System (FMCS) was used to code the mother’s use of controlling food parenting practices, and selected segments of the meal recording were shown to the mother during the MI-based feedback session. Although our study was the first to use the mother-child meal recording to provide feedback on food parenting practices, one previous study used a mother-child interaction recording to improve parenting practices.\textsuperscript{65} The study showed significant improvements in parenting practices (e.g., increased reaction to the infants verbal and non-verbal cues) after the mother was shown a recording of her interaction with her child.\textsuperscript{65} Although the study targeted general parenting practices, not food parenting practices, this study provides support for the use of a mother-child meal recording to provide feedback.

Motivational Interviewing and Childhood Obesity Interventions

A review by Borrello et al. examined the effects of six MI interventions targeting the parents of overweight and obese children between the ages of 2 to 11-years.\textsuperscript{61} Of the six interventions included in the review, three demonstrated statistically significant
reductions in child BMI or improvements in obesity-related behaviors (e.g., reductions in calorie consumption or television viewing). These findings suggest that MI interventions targeting parents may be an effective strategy for modifying behaviors associated with childhood overweight and obesity.

A randomized controlled trial by Resnicow et al. targeting the parents of overweight children between the ages of 2 to 8-years examined the effects of three distinct treatment groups on child weight status from baseline to 2-years. Participants were randomized into one of three treatment groups: 1) standard care (i.e., height and weight measurements), 2) standard care plus two MI sessions, or 3) standard care plus six MI session. This study showed statistically significant reductions in child BMI percentile in the two groups receiving MI when compared to the group receiving standard care only. These findings support the use of MI interventions with parents of overweight to reduce child BMI. However, since this study was conducted in primary care provider offices, it is unknown whether similar effects may be seen in home-based interventions.

Although existing research supports the use of parent-targeted MI sessions, little is known about the effects of MI on maternal food parenting practices. Therefore, research is needed to determine the effects of MI on maternal food parenting practices.

Conclusion

Although childhood overweight and obesity prevalence has declined or stabilized in some populations, childhood overweight and obesity prevalence continues to be disproportionately high in low-income and some minority populations. The high overweight and obesity prevalence in these populations underscores the importance of...
developing effective obesity prevention interventions. The etiology of childhood obesity is complex, resulting from both genetic and environmental factors. However, environmental factors (e.g., the family food environment) are modifiable, making these factors important targets for childhood obesity prevention efforts. In most households, mothers maintain the family food environment including the responsibility for child feeding via food parenting practices. Maternal food parenting practices play an important role in the development of a child’s eating behaviors, and subsequent weight status early in life, therefore learning how to modify these practices is essential. Although some studies have incorporated education on “best feeding practices” within multi-component obesity prevention interventions, few studies have directly attempted to modify maternal food parenting practices. Moreover, few studies have used a theoretical framework to understand how food parenting practices lead to food preferences and eating behaviors in preschool-aged children. Self-determination theory provides a framework for how maternal child feeding practices may lead to eating behaviors associated with obesity in children. As a goal-oriented approach to behavior change, MI may be an effective strategy for modifying maternal food parenting practices.

Given the evidence that food parenting practices influence a child’s eating behaviors, and subsequent weight status early in life, the purpose of this study was to examine the feasibility and acceptability of a novel home-based intervention to modify and improve maternal food parenting practices.
References


30. Centers for Disease Control and Prevention (CDC), Division of Nutrition, Physical Activity and Obesity. Pediatric Nutrition Surveillance System (PedNSS), Table 6D; 2011.

31. Centers for Disease Control and Prevention (CDC), Division of Nutrition, Physical Activity and Obesity. Pediatric Nutrition Surveillance System (PedNSS), Table 8D; 2011.


APPENDIX B
EXTENDED METHODS

Study Design

This study examined the feasibility, acceptability, and preliminary outcomes of a novel home-based early childhood obesity prevention intervention designed to modify and improve the food parenting practices of low-income mothers with preschool-aged children. The study included three home-based sessions, and used pretest/posttest measurements to assess changes in maternal food parenting practices. The University of Rhode Island Institutional Review Board approved all study procedures.


The student researcher contacted the Program Coordinator for a Special Supplemental Nutrition Program for Women, Infants and Children (WIC) office at Wood River Health Services (WRHS) in Westerly, Rhode Island. The WIC office provides supplemental foods, nutrition education, and health care referrals for low-income families at risk for nutritional deficiencies, making this office an ideal venue for participant recruitment. After conducting meetings with the Program Coordinator and the Director of Quality Improvement to discuss research and recruitment goals, the student researcher received permission to recruit participants from the WIC office at WRHS.

Participant Recruitment (August 2015 – January 2016)

Participant recruitment began in August 2015, and concluded in January 2016. During the recruitment period, WIC office staff provided interested mother-child dyads with an informational flyer (Appendix F) that included a brief description of the study and the student researcher’s contact information. In addition, the student
researcher was introduced to interested mother-child dyads in the office waiting area immediately following WIC appointments. As time allowed, interested mother-child dyads were screened for eligibility in the office waiting area. Mother-child dyads that expressed interest though lacked time to complete the screening process were contacted by the student researcher, and screened over the phone. In addition, informational flyers that included a brief description of the study and the student researcher’s contact information were posted in the office area.

**Participants**

A total of 25 mother-child dyads expressed interest in participating in the study. However, the student researcher was unable to contact 10 mother-child dyads to complete the screening process. A convenience sample of 15 mother-child dyads completed the screening process, and were recruited to participate in the study. Eligibility criteria included mothers (≥18 years of age) with a biological, adopted or stepchild between 2 to 5-years of age, who resided primarily in the mother’s home. In addition, participants needed to be English speaking, eat a minimum of three evening meals per week with her child, and be willing to have an evening meal video recorded in their home. Participants were ineligible for the study if the child had a diagnosed feeding disorder, dietary restrictions and/or medical conditions that impact maternal food parenting practice or were unable to provide informed consent.

**Procedures**

*Baseline Session.* The baseline session was conducted within 14-days of recruitment in the home of the mother-child dyad during the evening mealtime. Three days prior to the scheduled baseline session, the student researcher contacted the
mother to remind her of the session and the importance of maintaining typical meal functioning (e.g., prepare foods typically consumed by the family). On the day of the baseline session, the student researcher arrived 10-minutes prior to the scheduled evening meal to obtain informed consent and written permission (only if screened for eligibility via phone), provide information on the meal recording, and how to operate the video recording equipment. A Sony Handycam HD AVCHD (Sony Corporation of America, New York, NY) was used to record the evening meal. The student researcher positioned the Sony Handycam to capture the mother (i.e., mother’s upper torso, plate and drink in view) and the target child (i.e., child’s upper torso, plate and drink in view). The mother was instructed to maintain typical meal functioning, and to record until the target child finished his/her meal. Based on previous research, to support typical meal functioning the student researcher left the home during the meal and returned 30-minutes later.2

After the meal recording was completed, the student researcher administered baseline questionnaires including the Comprehensive Feeding Practices Questionnaire (CFPQ) and Demographics Questionnaire (see Appendix H). The mother-child dyads height and weight were measured using standardized procedures, and the video recording equipment collected. In addition, the feedback session was scheduled and remuneration ($30.00 gift card) provided. Childcare was provided (as needed) during the session. The baseline session lasted approximately 55 to 60-minutes.

**Feedback Session.** To allow for sufficient time for the student researcher to review the mother-child evening meal recording, the feedback session was conducted within 14-days of the baseline session. The feedback session was conducted in the home of
the mother-child dyad at a convenient time for the family. Childcare was provided (as needed) during the session.

The feedback session included a 60-minute, semiscripted MI session designed to elicit maternal narratives on food parenting practices, and increase motivation to improve these practices. The feedback session targeted five food parenting practices from the CFPQ: food as reward, environmental, involvement, modeling, and pressure to eat. The session included a review of the mother-child evening meal recording, a discussion on a food parenting practice of the mothers choosing, and the creation of a plan to improve food parenting practices.

During the session, the student researcher watched selected segments of the evening meal recording with the mother. The Family Mealtime Coding System (FMCS) was used to code and select the segments of the evening meal recording to watch with the mother. The feedback session was audio recorded using an Olympus VN-7000 voice recorder (Olympus America, Inc., Southborough, MA). Following the feedback session, the mothers received five handouts on best feeding practices. In addition, the follow-up appointment was scheduled and remuneration ($30.00 gift card) provided. The feedback session lasted approximately 55 to 60-minutes.

*Follow-up Session.* The follow-up session was conducted within 14-days of the feedback session in the home of the mother-child dyad at a convenient time for the family. During the follow-up session, mother’s completed the CFPQ and a Satisfaction Questionnaire. Childcare was provided (as needed). At the conclusion of the session, the student researcher offered the mother an opportunity to ask questions
regarding child feeding, and provided remuneration ($20.00 gift card). The follow-up session lasted approximately 20 to 30-minutes.

Measures

Demographic Questionnaire. The student researcher collected demographic data for the mother-child dyad at baseline. The following data was collected for the mother: age, race/ethnicity, marital status, employment status, total annual household income, highest education level, total number of family members in the household, and number of children in the household. Mothers were asked to provide the following data for their child: age, sex and race/ethnicity. In addition, one item regarding meal functioning, “Was this a typical meal for you and your child.” was included on the questionnaire. This item was scored on a 4-point Likert scale with response options 1 (somewhat typical) to 4 (very typical), with higher scores indicating the evening meal was more typical.

Anthropometrics. The student researcher collected height and weight data using standardized procedures for the mother-child dyad at the baseline session. Standing height was measured in duplicate to the nearest 0.25 inch using a single stadiometer (Seca 213; Seca Corporation, Hanover, Maryland). Weight was measured in duplicate to the nearest 0.1 pound using a single calibrated digital scale (Seca 813; Seca Corporation, Hanover, Maryland). Participants were instructed to wear light clothing and remove footwear. Maternal BMI (weight[kg]/height[m]^2) was calculated using the average of the height and weight measurements and classified into the following categories: underweight (<18.5), normal weight (18.5 to 24.9), overweight (25.0 to 29.9) and obese (≥30.0). Child BMI (weight[kg]/height[m]^2) was calculated using the
average of the height and weight measurements and plotted on the appropriate BMI-for-age growth chart. Growth chart percentiles were classified into the following categories: underweight (< 5th percentile), normal weight (5th to 84th percentile), overweight (85th to 94th percentile) and obese (≥95th percentile).\(^5\)

*Comprehensive Feeding Practices Questionnaire (CFPQ).* The student researcher administered the CFPQ at baseline and follow-up. The CFPQ is a 49-item, validated measure used to understand the feeding practices (i.e., food parenting practices) of parents with children 2 to 8-years of age.\(^6\) The measure includes 12-subscales: 1) child control, 2) emotion regulation, 3) encourage balance and variety, 4) environment, 5) food as reward, 6) involvement, 7) modeling, 8) monitoring, 9) pressure, 10) restriction for health, 11) restriction for weight control, and 12) teaching about nutrition.\(^3\)\(^5\) The CFPQ is scored using two response scales. For items 1 – 13, mothers indicate the frequency that they use each feeding practice on a 5-point Likert scale from 1 (never) to 5 (always). For items 14 – 49, mothers indicate their level of agreement on a 5-point Likert scale from 1 (disagree) to 5 (agree). Items 16, 37 and 42 are reverse coded. Higher subscale scores indicate greater use of that feeding practice. Mean scores were calculated for 5-subscales, and changes in mean scores were assessed pre/post for each participant (Appendix J).

*Family Mealtime Coding System (FMCS).* The student researcher used the FMCS to code the mother-child evening meal recording. The FMCS was developed to assess controlling food parenting practices: pressure (i.e., verbal encouragement to consume more food), physical prompts (i.e., physical encouragement to consume food), restriction (i.e., limiting consumption of foods), and use of incentives or conditions
(i.e., incentives to increase food consumption). The student researcher coded the frequency and time of the observed controlling feeding practices for each evening meal recording. Coding started once food arrived at the table and stopped when the meal ended or after 20-minutes. Only the mother’s food parenting practices with the target child were coded. Coding of the mother-child evening meal recording occurred prior to the feedback session.

*Satisfaction Questionnaire.* The student researcher asked mothers to complete a four item satisfaction questionnaire that included “Was it worth your effort to participate in this study?” and “This session increased your interest in learning how to feed your child in a healthy way?” Items were scored on a 4-point Likert scale from 1 (disagree strongly) to 4 (agree strongly), with higher response scores indicating greater satisfaction. In addition, participants were asked to respond to two open-ended questions about what they liked about the study, and what they would change for future studies.

*Motivational Interviewing Treatment Integrity Code 3.1.1 (MITI 3.1.1).* The MITI 3.1.1 is a behavioral coding system used to monitor MI fidelity. Global scores capture the rater’s overall impression of the session across five dimensions (i.e., evocation, collaboration, direction, autonomy/support and empathy). The five dimensions were individually scored on a 5-point Likert from 1 (low) to 5 (high), with higher scores indicating greater use of that dimension. Behavior counts capture interviewer behaviors during the session using five behavior codes (i.e., giving information, MI adherent, MI non-adherent, questions and reflections. The global scores and behavior
counts were converted to summary scores, which serve as the outcome measure for determining MI fidelity.

The MITI 3.1.1 includes thresholds for two levels of MI fidelity: beginning proficiency and competency. For instance, on the global scales, competency in MI is generally indicated by a score of at least 4.0 on a 5.0 scale. In terms of summary behavior counts, competency in MI is generally indicated by twice as many reflections as questions, 70% open questions (out of total questions), 50% complex reflections (out of total reflections), and 100% MI-adherent utterances (out of the total MI-adherent and non-adherent utterances). A trained rater used the MITI 3.1.1 to code a randomly selected 20-minute segment of five MI sessions conducted during the study. A second trained rater used the MITI 3.1.1 to double-code two of the five selected sessions.

Data Analysis

Descriptive statistics for study variables were calculated including means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Paired samples t-tests were used to determine if there was a statistically significant difference in the mean scores of the CFPQ subscales administered at baseline and follow-up sessions. Statistical analyses were performed using SPSS software (version 23.0, SPSS Inc., Chicago, IL, USA).
References


9. Moyers T, Martin T, Manuel J, Miller W, Ernst D. Revised Global Scales: Motivational Interviewing Treatment Integrity 3.1.1 (MITI 3.1.1); 2010.
APPENDIX C
CONSENT FORM

Consent Form for Participation
THE UNIVERSITY OF RHODE ISLAND

You have been invited to take part in a research project described below. The researcher will explain the project to you in detail. You should feel free to ask questions. If you have more questions later, Dr. Alison Tovar (401) 874-9855, the person mainly responsible for this research project will discuss them with you. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form to keep.

PURPOSE AND BACKGROUND
The purpose of this research project is to see if a one-on-one counseling session can help mothers feed their children in healthy ways. You are being asked to participate because you are at least 18-years old and have a child between the ages of 2 and 5-years old. We are asking you and your child to participate in a family meal video recording session and participate in height and weight measurements. In addition, we are asking you to participate in a one-on-one counseling session and fill out pre and post surveys. Your input will help us understand more about how you feed your child and provide useful information for you and your family.

PROCEDURES
If you agree to be in this study, the following will happen:

• You and your child will participate in a 55 to 60-minute session that will include a video recording of you and your child during an evening family meal. This session will include height and weight measurements for you and your child. Your child’s time in this session will be about 35-minutes. You will be also be asked to complete surveys about how you feed your child and information about your family (including family size, ages for you and your child, income and education level).

• You will participate in a 55 to 60-minute session to review the video recording of your evening meal with your child and discuss your thoughts on feeding your child. This session will be audio recorded.

• You will participate in a 30 to 40-minute session that includes a survey about how you feed your child and your thoughts about the study.

We will set up a convenient time for you to meet with the researcher in your home. In all, it will take about 2 ½ to 3-hours of participation to complete the study.
➢ RISKS
In the unlikely event that some of the survey or interview questions make you uncomfortable or upset, you are always free to decline to answer or to stop your participation at any time. It is possible that some participants may suffer nervousness when weight measurements are recorded. To protect participant privacy and self-esteem, all measurements will be taken in private areas, not said aloud, and will not label anyone as overweight, obese, underweight, too thin, or anorexic. Measurements will be taken along with surveys, so that the importance will not be on weight.

➢ BENEFITS
There will be no direct benefit to you from participating in this study. However, the information that you provide may help us understand how to help mothers feed their children in healthy ways.

➢ CONFIDENTIALITY
All information about you will be kept confidential. Once you agree to participate, you will be given an ID number that will be used as your identification throughout the study. To protect your confidentiality, you will be asked to use first names only and to not discuss personal identifying information during the sessions. Should other family members appear on the video and/or audio recordings, they will not be identified at any point during the study.

All names, personal information as well as video and audio recording will be kept in locked files at the University of Rhode Island Fogarty Hall 119, available only to the principal investigator and appropriate project staff. No one else will have access to your personal information. You can stop participating at any time and you will no longer be contacted. Your name will not be used in any written reports or publications that result from this research. Data will be kept in a locked cabinet for three years after the study is completed (per federal regulations) and then destroyed.

➢ IN CASE THERE IS AN INJURY TO THE PARTICIPANT
You will be offered complementary childcare in your home for your son/daughter during the research project. If your son/daughter is injured while in childcare, you will be notified immediately and you will be responsible for providing care for your son/daughter’s injury. If this study causes your son/daughter any injury, you should call or write the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu at the University of Rhode Island. If you have concerns about your son/daughter’s rights as a research participant, you may also call the office of the Vice President of Research and Economic Development, 70 Lower College Road, Suite 2, University of Rhode Island, Kingston, Rhode Island, telephone: (401) 874-4328.

➢ COMPENSATION
You will receive a $30.00 supermarket gift card for your first and second sessions for your participation. For the third (and last) session, you will receive a $20.00 supermarket gift card for your participation. In total, you will receive $80.00 in supermarket gift cards if you complete all three sessions.
 QUESTIONS
If you have any questions or concerns about your participation in this research project, you may contact the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu or the Student Investigator, Amy Moore: (740) 591-7984 or amy_moore@uri.edu at anytime.

RIGHT TO QUIT AT ANYTIME
The decision to take part in this study is up to you. You do not have to participate. If you decide to take part in the study, you may quit at any time. If you wish to quit, simply inform the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu of your decision.

RIGHTS AND COMPLAINTS
If you are not satisfied with the way this study is performed, you may discuss your complaints with Dr. Alison Tovar: (401) 874-9855, anonymously, if you choose. In addition, if you have questions about your rights as a research participant, you may contact the office of the Vice President of Research and Economic Development, 70 Lower College Road, Suite 2, University of Rhode Island, Kingston, Rhode Island, telephone: (401) 874-4328.

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DOCUMENTATION OF CONSENT
I have read this form and decided that I will participate in the project described above. Its general purposes, what I can expect and possible risks have been explained to my satisfaction. I understand I can withdraw myself and my child at any time.

Your signature on this form means that you understand the information and you agree to participate in this study.

_____________________________  __________________________
Signature of Participant  Signature of Researcher
_____________________________  __________________________
Typed/printed Name  Typed/printed name
_____________________________  __________________________
Date  Date
Your signature below means that you agree to allow the investigator(s) named above to video record you and your child during an evening family meal. You also give permission to have a one-on-one session with you audio recorded.

_____________________________  _________________________
Signature of Participant         Signature of Researcher

_____________________________  _________________________
Typed/printed Name              Typed/printed name

_____________________________  _________________________
Date                            Date

Please sign both consent forms, and keep one for yourself.
APPENDIX D
WRITTEN PERMISSION FORM

THE UNIVERSITY OF RHODE ISLAND

Can motivational interviewing and meal recording modify child feeding practices?:
A feasibility study

Your son/daughter has been invited to take part in the research project described below. My name is Amy Moore, and I am asking for permission to include your son/daughter in this research project. The purpose of this research project is to see if a one-on-one counseling session can help mothers feed their children in healthy ways. We are asking you and your child to participate in an evening meal video recording and participate in height and weight measurements. You are being asked to give permission for your child to take part in this research project so that we can video record him/her during an evening meal and collect his/her height and weight at the first session. If you have more questions, Dr. Alison Tovar (401) 874-9855, the person mainly responsible for the research project will discuss them with you.

WHY IS THIS PROJECT BEING DONE?
There is a need to help mothers learn about healthy ways to feed their children and to learn from mothers about what works for them. We want to help families be healthy and we want to learn how that might influence how children eat and grow.

WHAT IS INVOLVED IN THE PROJECT?
If you give permission for your child to participate, the following will happen:

- You and your child will participate in a 55 to 60-minute session that will include a video recording of you and your child during an evening family meal. This session will include height and weight measurements for you and your child. Your child’s time in this session will be about 35-minutes. You will also be asked to complete surveys about how you feed your child and information about your family (including family size, ages for you and your child, income and education level).

- For the remaining two sessions, your child will not participate but childcare will be available (if needed) for your child during these sessions.

We will set up a convenient time for you and your child to meet with the researcher in your home. In all, your child will participate for 35-minutes.

HOW LONG WILL YOUR CHILD BE IN THE PROJECT?
Your son/daughter will be asked to attend the first session with you so that we can video record your evening meal and take your son/daughter’s height and weight measurements. This will take about 35-minutes.
ARE THERE ANY RISKS?

It is possible that some children may be nervous when weight measurements are recorded. To protect their privacy and self-esteem, all measurements will be taken in private areas, not said aloud, and will not label any child as overweight, obese, underweight, too thin, or anorexic. Measurements will be taken along with parent surveys, so that the importance will not be on weight.

ALTERNATIVES

There are no alternative measurements for height and weight, but you may choose to not have your child’s height and weight measured.

WHAT ARE THE BENEFITS TO TAKING PART IN THE PROJECT?

There will be no direct benefit to you or your child from participating in this research project. However, the information that you provide may help us understand how to help mothers feed their children in healthy ways.

CONFIDENTIALITY

All information about your child will be kept confidential. Once you agree to participate, you and your child will be given a single ID number that will be used as your identification throughout the study. Should other family members appear on the video and/or audio recordings, they will not be identified at any point during the study.

All names, personal information as well as video and audio recording will be kept in locked files at the University of Rhode Island Fogarty Hall 119, available only to the principal investigator and appropriate project staff. No one else will have access to your personal information. You can stop participating at any time and you will no longer be contacted. Your name will not be used in any written reports or publications that result from this research. Data will be kept in a locked cabinet for three years after the research project is completed (per federal regulations) and then destroyed.

IN CASE THERE IS AN INJURY TO THE PARTICIPANT

You will be offered complementary childcare in your home for your son/daughter during the research project. If your son/daughter is injured while in childcare, you will be notified immediately and you will be responsible for providing care for your son/daughter’s injury. If this study causes your son/daughter any injury, you should call or write the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu at the University of Rhode Island. If you have concerns about your son/daughter’s rights as a research participant, you may also call the office of the Vice President of Research and Economic Development, 70 Lower College Road, Suite 2, University of Rhode Island, Kingston, Rhode Island, telephone: (401) 874-4328.

QUESTIONS

If you have any questions or concerns about your participation in this research project, you may contact the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu or the Student Investigator, Amy Moore: (740) 591-7984 or amy_moore@uri.edu at anytime.
RIGHT TO QUIT AT ANYTIME

Taking part in this research project is voluntary. Your child may choose not to participate, or they may leave from the project at any time. If at any time your child decides to leave this study, their name will be taken out from the database; but any data collected before will still be used. If you wish to quit, simply inform the Principal Investigator, Dr. Alison Tovar: (401) 874-9855 or alison_tovar@uri.edu of your decision.

RIGHTS AND COMPLAINTS

If you are not satisfied with the way this study is performed, you may discuss your complaints with Dr. Alison Tovar: (401) 874-9855, anonymously, if you choose. In addition, if you have questions about your rights as a research participant, you may contact the office of the Vice President of Research and Economic Development, 70 Lower College Road, Suite 2, University of Rhode Island, Kingston, Rhode Island, telephone: (401) 874-4328.

CONTACT FOR MORE INFORMATION

Alison Tovar, Ph.D. 
Principal Investigator 
University of Rhode Island 
Department of Nutrition and Food Science 
119 Fogarty Hall 
Kingston, Rhode Island 02881 
Phone: (401) 874-9855 
Email: alison_tovar@uri.edu

Amy Moore 
Student Investigator/Researcher 
University of Rhode Island 
Department of Nutrition and Food Science 
Fogarty Hall 
Kingston, Rhode Island 02881 
Phone: (740) 591-7984 
Email: amy_moore@uri.edu

DOCUMENTATION OF CONSENT

I have read this form and decided that my child will participate in the project described above. Its general purposes, what I can expect and possible risks have been explained to my satisfaction. I understand I can withdraw myself and my child at any time.

Your signature on this form means that you understand the information and you agree for your child to participate in this study.

__________________________________  ____________________________________
Signature of Parent/Guardian           Signature of Researcher

__________________________________  ____________________________________
Typed/printed Name                   Typed/printed Name

__________________________________  ____________________________
Typed/printed Child’s Name           Date

__________________________________
Date

69
Your signature below means that you agree to allow the investigator(s) named above to video record you and your child during an evening family meal.

______________________________  ________________________________
Signature of Parent/Guardian     Signature of Researcher

______________________________  ________________________________
Typed/printed Name              Typed/printed Name

______________________________  ________________________________
Typed/printed Child’s Name      Date

______________________________
Date

Please sign both consent forms, and keep one for yourself.
APPENDIX E
RECRUITMENT FLYER

The University of Rhode Island

Research Study

Dr. Alison Tovar and Amy Moore from the University of Rhode Island are conducting a study for mothers and their child between the ages of 2 - 5 years old.

The study provides an opportunity to talk about how you and your child interact during meal times.

The study includes three home visits – each visit will last about 1 hour. You’ll receive $80.00 for your time!

For more information email or call…

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984

amy_moore@uri.edu
(740) 591-7984
Dear Participant:

My name is Amy Moore and I am a graduate student in the Nutrition and Food Sciences Department at The University of Rhode Island. I am working with Dr. Alison Tovar, the person in charge of the study, for my final research project. As part of my final research project, I am studying if a one-on-one counseling session can help mothers feed their children in healthy ways. Given how important it is for children to eat healthy food for disease prevention, we believe this work is important. Because you are at least 18-years old and have a child between the ages of 2 and 5-years old, I am inviting you to participate in this research study.

If you agree to be in the project, we are asking you to participate in an evening meal video recording session, a one-on-one counseling session, fill out a pre and post survey and participate in height and weight measurements. Additionally, we ask that your child participates in the evening meal video recording with you and have his/her height and weight measured. Your child will be asked to participate in the project for about 35-minutes. In all, it will take about 2 ½ to 3-hours of your time to complete the study. We will set up a convenient time for us to meet in your home for all three sessions. If it is helpful, childcare can be available and complimentary during our sessions. All three sessions will be conducted in your home.

Thank you for your interest in participating in this research project. Your input will help us understand more about how you feed your child and provide useful information for you and your family. I am more than happy to set-up a time to talk more about the project. If you have any questions, you can reach Dr. Alison Tovar at (401) 874-9855 or alison_tovar@uri.edu. I can be reached at (740) 591-7984 or amy_moore@uri.edu. Thank you for your time.

Sincerely,

Amy Moore
Student Investigator/Researcher
The University of Rhode Island
Department of Nutrition
119 Fogarty Hall
Kingston, RI 02881
Phone: (740) 591-7984
Email: amy_moore@uri.edu

Alison Tovar, Ph.D.
Principle Investigator/Researcher
The University of Rhode Island
Department of Nutrition
Fogarty Hall
Kingston, RI 02881
Phone: (401) 874-9855
Email: alison_tovar@uri.edu
The University of Rhode Island
Nutrition and Food Sciences Department

Screening/Recruitment Appointment – Participant Eligibility

Researcher: Please read the following to the participant and fill-in the appropriate answers.

My name is Amy Moore. I am a graduate student at The University of Rhode Island working on a research project to understand how mothers feed their children. The goal of this project is to see if a one-on-one counseling session can help you feed your child in healthy ways. Your time commitment for this research project includes three sessions, which will last about 2 ½ to 3 hours. The first session will include a video recording of you and your child during your evening meal. We will also take you and your child’s height and weight and ask you to answer some questions about your families eating habits. Your child will only participate in the first session – this will take about 35-minutes. The two other sessions will be just you and me. The second session includes a one-on-one counseling session. The third session includes some questions about your family eating habits and your thoughts about the project. You will be given a total of $80 in gift cards for participating. If it’s helpful, complimentary childcare can be available during our sessions. The three sessions will be conducted in your home.

Is this something you would be interested in?

If no, thank the participant for her time.

If yes, proceed below.

Researcher: I’ll just ask you a few questions to see if you are eligible?

1. What is your age? ________

2. Do you have a child (biological or adopted) between 2 to 5-years of age, who lives with you most of the time?
   Yes (If yes, how old is the child? ________)
   No

3. Do you eat at least three evening meals with your child per week?
   Yes
   No

4. Does your child have a diagnosed feeding disorder (e.g., failure to thrive, oral motor skills delay, etc.)?
   Yes
   No
5. Does your child have dietary restrictions or a medical condition that impacts the way you feed him/her (e.g., dysphagia or swallowing disorders, gastrointestinal problems)?
   Yes
   No

6. Are you willing to have a meal (i.e., dinner) recorded in your home. Both you and your child would be in the video.
   Yes
   No

7. Does the participant speak English?
   Yes
   No

If item 1 = ≥18 years, items 2, 3, 6 and 7 = yes and items 4 and 5 = no, the participant is eligible.

**Participant Eligible:**

If **NO**, thank participant for their time.

If **YES**, congratulations you are eligible to participate! Let’s schedule a convenient day and time for your first session.

Baseline Session Date/Time: ____________________________________________
Address: ____________________________________________________________
Contact #: ____________________________________________________________

Do you prefer phone call or a text message (circle one) to remind you of our appointment?

What’s the best time to reach you? ________________________________

Would you like childcare during our sessions?  YES   NO

If yes, what sessions?  BL MI FU  (circle all that apply)

How many children? __________   What ages? __________

**Researcher:** Provide participant with an appointment card with the above information. Say, remember, the session will take place in your home around dinnertime. I’ll arrive about 10- minutes prior to dinnertime to introduce myself and set up the video equipment. Thank you for your time. I look forward to talking with you again.
APPENDIX H

DEMOGRAPHICS QUESTIONNAIRE

The University of Rhode Island
Nutrition and Food Sciences Department

Baseline Appointment – Participant Demographics

Researcher: Please read the following items to the participant and check the appropriate box(es).

1. What is your date of birth? ________ month/__________ day/________ year

2. Do you consider yourself Hispanic or Latino? Please select one.
   Yes
   No

3. How would you best describe your race? Please select all that apply.
   White
   African American or Black
   American Indian or Alaska Native
   Asian
   Pacific Islander or Hawaiian Native
   Other (please specify: ________________)

4. What’s your current marital status? Please select one.
   Married
   Separated
   Divorced
   Widowed
   Single
   Living together

5. What’s your current employment status? Please select one.
   Full-time
   Part-time
   Not employed
   Retired
   Other: ____________________
Participant #: _______

6. What was your household income before taxes during the previous year (e.g., 2014)?
   Please select one.
   - Less than $20,000
   - $20,000 to $29,999
   - $30,000 to $39,999
   - $40,000 to $49,999
   - $50,000 to $59,000
   - $60,000 or more

7. What’s the highest grade level you completed? Please select one.
   - Some high school
   - High school diploma or GED
   - Some college
   - Associates degree or technical school
   - 4-year college degree
   - Graduate degree (e.g., MA, MS, PhD, etc.)

8. Including yourself, how many people live in your household? _______
   8a. How many of the above (say number) are family members/relatives? _______
   8b. How many of the above (say number) are friends? _______

9. How many children under the age of 18 live in your household? _______
   a. What are their ages (in years)?  Child 1: _______ (child in mealtime observation video)
      Date of birth: _______ month/______ day/_______ year
      Child 2: _______
      Child 3: _______
      Child 4: _______
      Child 5: _______

10. What is your child’s (Child 1 above) sex?
    - Male
    - Female
11. Do you consider him/her Hispanic or Latino? Please select one.
   Yes
   No

12. How would you best describe his/her race? Please select all that apply.
   White
   African American or Black
   American Indian or Alaska Native
   Asian
   Pacific Islander or Hawaiian Native
   Other (please specify: _______________)

Mealtime Observation Recording Questions
1. Was this a typical meal for you and your child?
   Not at all typical
   Somewhat typical
   Typical
   Very typical

2. How interested are you in changing how you feed your child?
   I do not plan to change the way I feed my child.
   I plan to change the way I feed my child in the next 6 months.
   I plan to change the way I feed my child in the next 30 days.
   I have changed the way I feed my child for 1-5 months.
   I have changed the way I feed my child for 6 months or more.
   I choose not to answer.
3. What area of feeding your child are you most interested in talking about?
   I want to talk about helping my child eat fruits and vegetables without making them.
   I want to talk about helping my child get enough food without making them eat more.
   I want to talk about how to incorporate my child in meal planning and preparation.
   I want to talk about how to role model healthy eating behaviors for my child.
   I want to talk about something else related to feeding my child. What would you like to talk about: _________________________________.
   Participant #: ________
APPENDIX I

PARTICIPANT ANTHROPOMETRICS

Participant #: ________

The University of Rhode Island
Nutrition and Food Sciences Department

Baseline Appointment – Participant Anthropometrics

Researcher: Please instruct participants to remove heavy clothing (e.g., sweaters, coats, etc.), shoes and top of head ponytails that could impact scale and stadiometer readings. Both height and weight measurements will be taken in duplicate. BMI will be calculated after the session.

Mother’s Anthropometrics

<table>
<thead>
<tr>
<th>Height (measured to nearest 0.25 in.)</th>
<th>________</th>
<th>________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (measured to nearest 0.1 lb.)</td>
<td>________</td>
<td>________</td>
</tr>
</tbody>
</table>

Child’s Anthropometrics

<table>
<thead>
<tr>
<th>Height (measured to nearest 0.25 in.)</th>
<th>________</th>
<th>________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (measured to nearest 0.1 lb.)</td>
<td>________</td>
<td>________</td>
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</tbody>
</table>
**APPENDIX J**

**COMPREHENSIVE FEEDING PRACTICES QUESTIONNAIRE**

**Participant #: __________**

---

### Comprehensive Feeding Practices Questionnaire (CFPQ)

*Explain to the Participant:* Parents take many different approaches to feeding their children and may have different concerns about feeding depending on their child. Please answer the following questions as honestly as possible with this child in mind.

**Researcher:** Place a check in the appropriate response box.

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Mostly</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How much do you keep track of the sweets (candy, ice cream, cake, pies, pastries) that your child eats?</td>
<td></td>
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<tr>
<td>2. How much do you keep track of the snack food (potato chips, Doritos, cheese puffs) that your child eats?</td>
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<tr>
<td>3. How much do you keep track of the high-fat foods that your child eats?</td>
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<tr>
<td>4. How much do you keep track of the sugary drinks (soda/pop, Kool-Aid) that this child drinks?</td>
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<tr>
<td>5. Do you let your child eat whatever s/he wants?</td>
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<tr>
<td>6. At dinner, do you let this child choose the foods s/he wants from what is served?</td>
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<tr>
<td>7. When this child gets fussy, is giving him/her something to eat or drink the first thing you do?</td>
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<tr>
<td>8. Do you give this child something to eat or drink if s/he is bored even if you think s/he is not hungry?</td>
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<tr>
<td>9. Do you give this child something to eat or drink if s/he is upset even if you think s/he is not hungry?</td>
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<tr>
<td>10. If this child does not like what is being served, do you make something else?</td>
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<tr>
<td>11. Do you allow this child to eat snacks whenever s/he wants?</td>
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<tr>
<td>12. Do you allow this child to leave the table when s/he is full, even if your family is not done eating?</td>
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<tr>
<td>13. Do you encourage this child to eat healthy foods before unhealthy ones?</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Question</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neutral</th>
<th>Slightly Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Most of the foods I keep in the house are healthy.</td>
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<tr>
<td>15. I involve my child in planning family meals.</td>
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<tr>
<td>16. I keep a lot of snack food (potato chips, Doritos, cheese puffs) in my house.</td>
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<td>17. My child should always eat all the food on his/her plate.</td>
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<tr>
<td>18. I have to be sure that my child does not eat too many high-fat foods.</td>
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<tr>
<td>19. I offer my child his/her favorite foods in exchange for good behavior.</td>
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<tr>
<td>20. I allow my child to help prepare family meals.</td>
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<tr>
<td>21. If I did not guide or regulate my child’s eating, s/he would eat too much of his/her favorite foods.</td>
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<tr>
<td>22. A variety of healthy foods are available to my child at each meal served at home.</td>
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<tr>
<td>23. I offer sweets (candy, ice cream, cake, pastries) to my child as a reward for good behavior.</td>
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<tr>
<td>24.</td>
<td>I encourage my child to try new foods.</td>
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<tr>
<td>25.</td>
<td>I discuss with my child why it is important to eat healthy foods.</td>
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<tr>
<td>26.</td>
<td>I tell my child that healthy foods taste good.</td>
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<tr>
<td>27.</td>
<td>I encourage my child to eat less so he/she won’t get fat.</td>
<td></td>
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<tr>
<td>28.</td>
<td>If I did not guide or regulate my child’s eating, he/she would eat too many junk foods.</td>
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<tr>
<td>29.</td>
<td>I give my child small helpings at meals to control his/her weight.</td>
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<tr>
<td>30.</td>
<td>If my child says “I’m not hungry,” I try to get him/her to eat anyway.</td>
<td></td>
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<tr>
<td>31.</td>
<td>I discuss with my child the nutritional value of food.</td>
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<td>32.</td>
<td>I encourage my child to participate in grocery shopping.</td>
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<tr>
<td>33.</td>
<td>If my child eats more than usual at one meal, I try to restrict his/her eating at the next meal.</td>
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<tr>
<td>34.</td>
<td>I restrict the food my child eats that might make him/her fat.</td>
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<tr>
<td>35.</td>
<td>There are certain foods my child shouldn’t eat because they will make him/her fat.</td>
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<tr>
<td>36.</td>
<td>I withhold sweets/dessert from my child in response to bad behavior.</td>
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<tr>
<td>37.</td>
<td>I keep a lot of sweets (candy, ice cream, cake, pastries) in my house.</td>
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<tr>
<td>38.</td>
<td>I encourage my child to eat a variety of foods.</td>
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<tr>
<td>39.</td>
<td>If my child eats only a small helping, I try to get him/her to eat more.</td>
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<tr>
<td>40.</td>
<td>I have to be sure that my child does not eat too much of his/her favorite foods.</td>
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<tr>
<td>41.</td>
<td>I don’t allow my child to eat between meals because I don’t want him/her to get fat.</td>
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<tr>
<td>42.</td>
<td>I tell my child what to eat and what not to eat without explanation.</td>
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<tr>
<td>43.</td>
<td>I have to be sure that my child does not eat too many sweets (candy, ice cream, cake or pastries).</td>
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<tr>
<td>44.</td>
<td>I model healthy eating for my child by eating healthy foods myself.</td>
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<tr>
<td>45.</td>
<td>I often put my child on a diet to control his/her weight.</td>
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<tr>
<td>46.</td>
<td>I try to eat healthy foods in front of my child, even if they are not my favorite.</td>
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<tr>
<td>47.</td>
<td>I try to show enthusiasm about eating healthy foods.</td>
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<tr>
<td>48.</td>
<td>I show my child how much I enjoy eating healthy foods.</td>
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<tr>
<td>49.</td>
<td>When he/she says he/she is finished eating, I try to get my child to eat one more (two more, etc.) bite of food.</td>
<td></td>
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</tr>
</tbody>
</table>
Child Control – Parents allow the child control of his/her eating behaviors and parent-child feeding interactions.

5. Do you let your child eat whatever s/he wants?
6. At dinner, do you let this child choose the foods s/he wants from what is served?
10. If this child does not like what is being served, do you make something else?
11. Do you allow this child to eat snacks whenever s/he wants?
12. Do you allow this child to leave the table when s/he is full, even if your family is not done eating?

Emotion Regulation – Parents use food to regulate the child’s emotional states.

7. When this child gets fussy, is giving him/her something to eat or drink the first thing you do?
8. Do you give this child something to eat or drink if s/he is bored even if you think s/he is not hungry?
9. Do you give this child something to eat or drink if s/he is upset even if you think s/he is not hungry?

Encourage Balance and Variety – Parents promote well-balanced food intake, including varied foods and healthy food choices.

13. Do you encourage this child to eat healthy foods before unhealthy ones?
23. I encourage my child to eat healthy foods before unhealthy ones.
24. I encourage my child to try new foods.
25. I encourage my child to eat healthy foods before unhealthy ones.
26. I tell my child that healthy foods taste good.
32. I encourage my child to participate in grocery shopping.
33. I encourage my child to eat healthy foods before unhealthy ones.
34. I encourage my child to try new foods.
35. I encourage my child to eat healthy foods before unhealthy ones.
36. I encourage my child to eat healthy foods before unhealthy ones.
37. I encourage my child to eat healthy foods before unhealthy ones.
38. I encourage my child to eat healthy foods before unhealthy ones.

Environmental – Parents make healthy food available in the home.

14. Most of the foods I keep in the house are healthy.
16. I keep a lot of snack food (potato chips, Doritos, cheese puffs) in my house. R
22. A variety of healthy foods are available to my child at each meal served at home.
37. I keep a lot of sweets (candy, ice cream, cake, pastries) in my house. R

Food as Reward – Parents use food as a reward for child behavior.

23. I offer sweets (candy, ice cream, cake, pastries) to my child as a reward for good behavior.
36. I withhold sweets/dessert from my child in response to bad behavior.
19. I offer my child his/her favorite foods in exchange for good behavior.

Involvement – Parents encourage child’s involvement in meal planning and preparation.

15. I involve my child in planning family meals.
20. I allow my child to help prepare family meals.
32. I encourage my child to participate in grocery shopping.

Modeling – Parents actively demonstrate healthy eating for the child.

44. I model healthy eating for my child by eating healthy foods myself.
46. I try to eat healthy foods in front of my child, even if they are not my favorite.
47. I try to show enthusiasm about eating healthy foods.
48. I show my child how much I enjoy eating healthy foods.
Monitoring – Parents keep track of child’s intake of less healthy foods.
1. How much do you keep track of the sweets (candy, ice cream, cake, pies, pastries) that your child eats?
2. How much do you keep track of the snack food (potato chips, Doritos, cheese puffs) that your child eats?
3. How much do you keep track of the high-fat foods that your child eats?
4. How much do you keep track of the sugary drinks (soda/pop, Kool-Aid) that your child drinks?

Pressure – Parents pressure the child to consume more food at meals.
17. My child should always eat all the food on his/her plate.
30. If my child says “I’m not hungry,” I try to get him/her to eat anyway.
39. If my child eats only a small helping, I try to get him/her to eat more.
49. When he/she says he/she is finished eating, I try to get my child to eat one more (two more) bites of food.

Restriction for Health – Parents control the child’s food intake with the purpose of limiting less healthy foods and sweets.
21. If I did not guide or regulate my child’s eating, s/he would eat too much of his/her favorite foods.
28. If I did not guide or regulate my child’s eating, he/she would eat too many junk foods.
40. I have to be sure that my child does not eat too much of his/her favorite foods.
43. I have to be sure that my child does not eat too many sweets (candy, ice cream, cake or pastries).

Restriction for Weight Control – Parents control the child’s food intake with the purpose of decreasing or maintaining the child’s weight.
18. I have to be sure that my child does not eat too many high-fat foods.
27. I encourage my child to eat less so he/she won’t get fat.
29. I give my child small helpings at meals to control his/her weight.
33. If my child eats more than usual at one meal, I try to restrict his/her eating at the next meal.
34. I restrict the food my child eats that might make him/her fat.
35. There are certain foods my child shouldn’t eat because they will make him/her fat.
41. I don’t allow my child to eat between meals because I don’t want him/her to get fat.
45. I often put my child on a diet to control his/her weight.

Teaching about Nutrition – Parents use explicit didactic techniques to encourage consumption of healthy foods.
25. I discuss with my child why it is important to eat healthy foods.
31. I discuss with my child the nutritional value of food.
42. I tell my child what to eat and what not to eat without explanation. R

Note: Factor names are presented with a brief operational definition of the factor content. Item numbers indicate the order in which they are presented in the survey. Items numbered 1-13 utilize a 5-point response scale “never, rarely, sometimes, mostly, always.” Items numbered 14-49 utilize a 5-point response scale with different anchors “disagree, slightly disagree, neutral, slightly agree, agree.” Items marked with an R are reserve coded.
APPENDIX K

FAMILY MEALTIME CODING SYSTEM

The University of Rhode Island
Nutrition and Food Sciences Department

Baseline Appointment – FMCS Coding

<table>
<thead>
<tr>
<th>Feeding Practices (mother to target child)</th>
<th>Frequency/Count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pressure to eat</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical prompt</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Restriction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Use of incentives/conditions</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environment</th>
<th>1. Target child (TC) selected own portions/served self?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ All foods ○ Some foods ○ Foods portioned by parents and served to child</td>
</tr>
<tr>
<td>2. Did parents serve TC second helpings without being asked for more by the child?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ No ○ Yes, number of times ______</td>
</tr>
<tr>
<td>3. Was food used to control any type of non-eating behavior of the TC?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ No ○ Yes, number of times ______</td>
</tr>
<tr>
<td>4. Did parents talk with the TC about healthy food or topics related to consumption of healthy foods?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ No ○ Yes, number of times ______</td>
</tr>
<tr>
<td>5. Was the TV on during the meal?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ No ○ Yes, observed and heard ○ Yes, heard only</td>
</tr>
<tr>
<td>6. Did parents determine if the TC was full before removing his/her plate?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ No ○ Yes, number of times ______</td>
</tr>
<tr>
<td>7. When TC requests seconds, did parent determine if he/she was still hungry before serving more?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>○ No ○ Yes, mother number of times ______ ○ TC didn’t request seconds</td>
</tr>
</tbody>
</table>
Family Mealtime Coding System (FMSC)

Operational Definitions

Note: All variables are coded separately for the mother and target child (TC). The tone of the mothers’ vocalizations is irrelevant – e.g., if a mother politely requests that her child have another mouthful, it is still coded as pressure to eat.

<table>
<thead>
<tr>
<th>Variable Coded</th>
<th>Recipient</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure to eat</td>
<td>Target child</td>
<td>Parental <strong>verbal</strong> encouragement to consume more food, such as: “eat a little bit more”, “have some peas” or “eat three more mouthfuls. Includes gentle use of coercion, such as: “just eat the meat” or “try a mouthful”.</td>
</tr>
<tr>
<td>Physical prompt</td>
<td>Target child</td>
<td>Parental use of <strong>physical</strong> encouragement to get child to eat, usually by offering food to the child. Includes placing food on the spoon/fork and offering it to the child or putting food on the cutlery ready for the child to pick up and eat.</td>
</tr>
<tr>
<td>Restriction</td>
<td>Target child</td>
<td>Limiting children’s consumption of foods, for example, not letting them have any more cheese or garlic bread or by restricting the amount of biscuits the child is allowed to eat. This can be verbal “you can’t have any more” or physical restriction, such as moving the garlic bread away.</td>
</tr>
<tr>
<td>Use of incentives/</td>
<td>Target child</td>
<td>Verbal use of incentives or bargaining in an attempt to increase children’s food consumption. For example, “Mummy will be so happy if you eat your beans” or “eat this then you can have pudding.”</td>
</tr>
</tbody>
</table>

The frequency of observed behaviors is scored by logging/recording each instance of a particular type of observed control.
The University of Rhode Island
Nutrition and Food Sciences Department

Feedback Session – MI Script

INTRODUCTION/RAPPORT (3 minutes)

Just a reminder, my name is Amy – I am a graduate student at the University of Rhode Island. Thank you for participating in this study and opening your home to me. Your thoughts and experiences are important.

Before we get started, I would like to take a moment to talk about confidentiality or keeping your information private. Everything we discuss and all the questions you answer are private and confidential. I am recording our session to better understand how to improve our sessions, but who you are is not associated with the recording (only your participant number is on the recording). We don’t use your name or your child’s name in our materials. What questions do you have about confidentiality?

The main reason we are meeting today is to review the meal recording of you and your child from our last session and discuss your thoughts about feeding your child. We’ll also discuss if you would like to make any changes to how you feed your child. Whether you make any changes to how you feed your child is totally up to you. I’m not here to judge you or talk you into making any changes. Remember, only you know what works best for you and your child. I am here to give you a chance to talk about your experiences and to see if what your doing now fits with what you want for your child’s future.

What questions do you have? If you have any questions during our talk please feel free to ask me.

FAMILY MEALTIME OVERVIEW (12 minutes)

To get started, you mentioned you have _______ child/ren.

Tell me a little bit about your child/ren? Affirm and reflect.

What does a typical day look like for you and your child/ren? Affirm and reflect statements regarding positive aspects of the participant’s day with her child (children).

What about mealtimes, tell me about a typical meal with your child/ren. Affirm and reflect statements regarding positive aspects of the participant’s meal with her child (children).
If participant is unsure how to answer, Tell me about yesterday’s dinner? or Share with me anything you think is important about meals with your child/ren.

When thinking about a typical meal with your child/ren, what parts of the meal do not work so well? What else? or Tell me more about that. Affirm and reflect.

What parts work well? What else? or Tell me more about that. Affirm and reflect.

What do you think helps make meals work well?

If participant is unsure how to answer, What do you do to make meals successful?

Affirm and reflect self-motivational statements:
- Importance of participants role in creating a healthy environment
- Positive aspects of meals with child/ren
- Confidence that she can make choices about what is right for her family
- Intentions to change the mealtime environment

Summarize the Family Mealtime Overview.

MEALTIME RECORDING REVIEW (18 minutes)

The next section will focus on the target child from the video (not all children).

Now let’s take a few minutes to review the meal recording from our last session.

As a reminder, I’m not here to judge you or how you feed your child. Only you know what’s best for you and your child. I’m here to talk about your thoughts and experiences when feeding your child. Play selected video segments (approx. 5 minutes of segment time).

What sticks out from the video? What surprised you?

What else?

If participant is unable to come up with anything or looks lost then say I’d like to share with you what I noticed if that’s okay? Wait for affirmation, then discuss participant strengths/areas where she demonstrated healthy child feeding practices.
How do you know when your child has had enough to eat or is full? Reflect.

If participant is unable to come up with anything or has misinformation then say If it’s okay with you, I can share ways others have found helpful. Provide information with permission. Illicit participants thoughts on the information presented.

Tell me about the strategies you use to feed your child? Reflect.

What are some of the good things about those strategies? What else? Reflect.

Affirm and reflect self-motivational statements:

- Expression of concerns raised by participant
- Importance of feeding her child in healthy ways
- Confidence in feeding her child
- Optimism that she can change (change talk)

Summarize the Mealtime Recording Review.

IMPORTANCE AND CONFIDENCE (5 minutes)

Now let’s switch gears a little bit. On a scale from 0 to 10, where 0 is the least important and 10 is the most important, how important is it to feed your child in healthy ways.

Why is it an X instead of an X-1? Reflect.

What would it take to get to an X + 1? Reflect.

On a scale from 0 to 10, where 0 is the least confident and 10 is the most confident, what is your confidence level for feeding your child in healthy ways.

Why is it an X instead of an X-1? Reflect.

What would it take to get to an X + 1? Reflect.
FEEDING PRACTICES (8 minutes)

Previously, you mentioned you were interested in learning more about healthy ways to feed your child like say below?

Prior to the session, check the box the participant selected during the baseline session.

- helping your child eat fruits and vegetables without making them.
- helping your child get enough food without making them to eat more.
- role modeling healthy eating behaviors for your child.
- how to incorporate your child in meal planning and preparation.
- something else related to feeding your child, e.g., ___________________________
  _________________________________________

Tell me about what makes this topic interesting to you? What else? Reflect.

What are you currently doing to say above? What else? Affirm and reflect.

What do you find does not work? Reflect.


If participant provides misinformation or struggles to come up with anything then say
If it’s okay with you, I can offer you some information about say above. Provide information with permission. Elicit participant’s thoughts on the information presented.

DEVELOPING A PLAN (12 minutes)

We covered a lot so far regarding meals with your children, your interest in learning more about feeding your child and your importance and confidence in feeding your child in healthy ways.

I’m wondering what you make of this information? Reflect.

How do you see yourself using this information (if you choose)? Reflect.

What changes might you be interested in making? Reflect.
Participant #: ________

Affirm any indication that the participant wants to make a change. Use open-ended questions, affirmations, reflections and summaries to elicit and reinforce any language indicating the participants desire, ability, reason, need or commitment to change feeding practices.

Plans include a specific goal(s), reasons for the plan, potential barriers to completing the plan and some possible solutions (including social supports).

Some mothers decide to make a plan to help them try new ways to feed their child/ren.

Pull out Plan sheet: We use this sheet to help people think about plans they may want to make. Keep in mind that your plan does not have to be a commitment to do something.

It might be a plan to think about allowing your child to decide how much to eat, it might be not telling your child that he/she has to finish everything on their plate or even role modeling eating fruits and vegetables.

It’s up to you to decide whether or not you want to make any changes – only you can make that decision.

If participant decides to make a plan say I can do all the writing so you can concentrate on your plan.

Guide participant with the following parts of the plan:

- What is the plan
- Reasons for the plan/why it is important
- Steps she can take to accomplish the plan
- Barriers to the plan
- Possible solutions to the barriers
- Why she can do the plan

Summarize the plan.

Affirm plan and express optimism about change, I think you have done a great job of coming up with ideas for your plan – I believe this plan can help you achieve the goals you have set for yourself.
CLOSING (2 minutes)

We’ve covered a lot during our session – it has been great talking with you. If it’s okay with you, I would like to take a moment to summarize our session today. Use participant’s words, highlight the major points and affirm commitment to change.

Before we finish, what questions might you have?

Thank you for your time – I appreciate you welcoming me into your home.

Let’s schedule our next appointment.
APPENDIX M

MOTIVATIONAL INTERVIEWING TREATMENT INTEGRITY CODE

The University of Rhode Island
Nutrition and Food Sciences Department

Follow-up Appointment – MITI Coding

Coder: __________________ Date: __________________

Researcher: Use a 20-minute segment of the MI session to code Global Ratings and Behavior Counts. Place an ‘X’ in the corresponding box and calculate the overall scores for both categories.

Global Ratings

<table>
<thead>
<tr>
<th>Scores</th>
<th>1 Low</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaboration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomy/Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empathy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Behavior Counts

<table>
<thead>
<tr>
<th>Category</th>
<th>Behavior Counts</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giving Information</td>
<td>Giving general information</td>
<td></td>
</tr>
<tr>
<td>MI Adherent</td>
<td>Asking permission, affirming, emphasizing control, support</td>
<td></td>
</tr>
<tr>
<td>MI Non-Adherent</td>
<td>Advise, confront, direct</td>
<td></td>
</tr>
<tr>
<td>Questions</td>
<td>Closed Questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open Questions</td>
<td></td>
</tr>
<tr>
<td>Reflections</td>
<td>Simple Reflections</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complex Reflections</td>
<td></td>
</tr>
</tbody>
</table>

Summary Scores

<table>
<thead>
<tr>
<th>Formula</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Spirit Rating = (Evocation + Collaboration + Autonomy Support)/3</td>
<td></td>
</tr>
<tr>
<td>Percent Complex Reflection (%CR) = Rc/Total Reflections</td>
<td></td>
</tr>
<tr>
<td>Percent Open Questions (%OC) = OQ/(OQ + CQ)</td>
<td></td>
</tr>
<tr>
<td>Reflection-to-Question Ratio (R:Q) = Total Reflections/(CQ + OQ)</td>
<td></td>
</tr>
<tr>
<td>Percent MI Adherent (%MiA) = MiA /(MiA + MiNa)</td>
<td></td>
</tr>
</tbody>
</table>

Coding Start Time: ____________ Coding Stop Time: ____________

First Sentence: __________________________________________________________
Follow-up Appointment – Satisfaction Questionnaire

*Researcher:* Please provide questionnaire to participant upon completion of the study. Please ask the participant to place an ‘X’ in the appropriate response boxes.

<table>
<thead>
<tr>
<th>Participant Satisfaction Questionnaire</th>
<th>Disagree Somewhat</th>
<th>Disagree Strongly</th>
<th>Agree Somewhat</th>
<th>Agree Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It worth your effort to participate in this study?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The session increased your interest in understanding how to feed your child in a healthy way?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The study was relevant or meaningful to you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Our discussion was helpful when compared to discussions you’ve had with other professionals regarding feeding your child?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Participant:* We are interested in what you thought about the study. Please take a moment to let us know what you liked about the study and what you would change in the future. Thank you!

| 1. What did you like about this study? |                   |
| 2. What would you change about this study? |                   |