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Development and validation of a mindful food parenting instrument to assess the relationship between parent food practices and children's dietary outcomes

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by

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Abstract

American children's diets are commonly recorded as deficient in nutrient rich foods such as vegetables, fruits, and whole grains. Such diets often exceed amounts of unhealthy items such as added sugars and sweetened beverages. In addition, 23% of children are considered overweight or obese. Mindfulness techniques in parents have been correlated with improved dietary outcomes in children and a healthier family eating environment.

The primary aim of this study was to develop and validate an instrument that reflects the theoretical framework drawn from current models of mindful eating, mindful parenting and mindful food parenting. The instrument is a practical tool that seeks to measure mindful food parenting. The tool is closely related to parental actions that can create an internal and external environment conducive to mindful eating in children ages 4 to 8 years old. The final version of the mindful food parenting instrument (MFPI) includes three components: bringing mindful awareness to eating experience; creating awareness of the hunger and fullness experience; and cultivating awareness of parent and child emotions and reactivity to emotions.

Validation of the instrument consisted of a series of steps and included experts and parents review of questions for clarity and understanding. Content validity and reliability tests involved two sets of parents. Additionally, the current study explored the relationship between the components of the mindful food parenting model and young children's dietary outcomes. Results showed a good content validity and reliability for the instrument. Furthermore, results showed a correlation between mindful food parenting and children's dietary outcomes. In conclusion, results from this study suggest that the MFPI is an adequate tool to measure mindful

food parenting. Additionally this tool has the potential to measure mindful food parenting interventions.

Dedication

I would like to dedicate this dissertation to my son Luke, whose smile pushes me to be the best version of myself. Also to my parents, whose love and support are present every day. Finally, to my sister who works tirelessly to achieve her goals and has been an inspiration and supports during this journey.

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Chapter I: Introduction

American children's diets are commonly recorded as deficient in nutrient rich foods such as vegetables, fruits, and whole grains. Such diets often exceed the amount of unhealthy items such as added sugars and solid fat.[1] In addition, 23% of children are considered overweight or obese. [2] The presence of an elevated BMI percentile in childhood tends to continue into adulthood.[3] Moreover, childhood obesity can lead to adverse physical health consequences during childhood or later in life. Furthermore, obesity early in life can contribute to the onset of psychiatric and psychological disorders, as well as negative effects in the physico-social domain and the overall quality of life.[4]

Beyond providing food, parents' feeding styles and practices, beliefs, and personal emotions all contribute to a child's diet quality, feeding behaviors and weight. A large body of research has looked into the relationship between these factors. Parental feeding styles that have been associated with positive outcomes include: parental modeling,[5-7] responsive feeding,[8] and healthy food availability at home.[5,7] On the opposite hand, feeding practices related to negative outcomes include food restriction,[7,9] permissive/indulgent feeding,[5,9] using food as a reward,[7] and emotional feeding.[10-12]

Home environment plays a key role in the development of healthier eating behaviors in children. For example eating meals as a family,[13] infrequently eating meals in front of the

television,[13] parental modeling/encouragement,[5] and the availability of healthy food at home,[14] has been correlated with increased intake of fruits and vegetables.[13]

Mindfulness techniques in parents have been correlated with improved dietary outcomes in children and a healthier family eating environment.[15-18] In addition, such techniques have been negatively associated with emotional eating and overeating in children and adolescents.[11] However, specific techniques aimed at mindfully parenting around food and mealtimes are mostly unexplored and have the potential to improve dietary outcomes in a sustainable manner.

The main focus of the study was to create and validate an instrument to measure mindfulness when parenting around food. While one tool has been previously developed and validated, the Mindful Food Parenting Questionnaire (MFPQ), only the Present Centered Awareness subscale of the tool has been used in subsequent studies. [18,19] The Mindful Food Parenting Instrument (MFPI) was designed to measure mindful food parenting in a way that can relate to parental actions aimed to create an internal and external environment conducive to mindful eating in small children. Considering that the MFPI was, in part, developed using an intervention model, this instrument has the potential to be used during mindful food parenting interventions. Furthermore, to our knowledge, this was the first tool related to mindful food parenting developed by Registered Dietitians.

Mindfulness

Mindfulness has been defined as awareness to present events and experience, and involves being fully present from moment to moment, with full awareness of one's own emotional state and physical condition, as well as one's surroundings. [20]

Mindful eating in adolescents and adults

Mindful eating generally refers to the application of mindfulness techniques to eating, including nonjudgmental awareness of internal and external cues impacting the desire to eat, and eating in response to those cues. A mindful eater focuses on internal hunger and satiety cues and eats in response to such physiological triggers.[21]

Because mindful eaters are aware of all cues affecting their own eating behaviors and health, this technique can be a useful strategy to influence food consumption to maximize health and prevent diseases.[22]

Mindful parenting

Mindful parenting is the application of mindfulness to parenting. At the core of mindful parenting is the practice of being fully present during parent-child interactions. By being present, parents are able to pause and shift their awareness to focus on the present-moment parenting experience within the context of the long term relationship with their child.[23]

In terms of dietary outcomes mindful parenting interventions have been correlated with improvements in parental stress[16] which has been associated with negative dietary outcomes,[15] emotional eating, and overeating among children and young adolescents.[11] In addition, mindful

parenting was correlated with more adaptive parent-child feeding practices (i.e. lower use of food as a reward, pressure to eat and monitoring).[11] Furthermore, mindful interventions have been successfully associated with parents' creation of healthier eating environments and diet quality for their children.[15]

Mindful food parenting

Just as mindful eating targets mindful and mindless eating, mindful food parenting explores mindless and mindful parent behavior related to children's food intake.[17] Mindful parenting around food or mindful feeding, is a novel concept that has negatively predicted the use of food to regulate a child's emotions and the use of food as a reward. [17]

In terms of dietary outcomes, mindful food parenting positively predicted parental encouragement of a well balanced diet.[17] It was negatively associated with the intake of fast foods, salty snacks, [17] soda, [17,18] and sweetened beverages.[9] Moreover, it was positively associated with parent-reported child intake of fruits, vegetables, and whole grains.

Mindful Food Parenting Measurement Tools

Currently, only one measurement of mindful food parenting exists: the Mindful Food Parenting Questionnaire.[17] The questionnaire contains four subscales, however only the present centered awareness subscale of the tool has been used in subsequent studies [18,19] due to its strong psychometric properties.[19] While this is congruent with the notion that the mindful parenting core is the practice of being fully present during parent-child interactions,[23] a more comprehensive measurement is necessary. The other subscales in Meer's questionnaire are present-centered

awareness, present-centered emotional awareness, and nonjudgmental receptivity. Furthermore, while Meer's questionnaire contains well thought measures of mindful parenting, the measures are abstract rather than specific. Thus, there is a need for an instrument that can better measure mindful food parenting interventions. The tool developed for this study, the MFPI, was designed to measure mindful food parenting in a way that can relate to parental actions aimed to create an external and internal environment for mindful food parenting that better complement interventions.

Problem Statement

The diet of children living in the United States is deficient of important foods that provide essential nutrients such as vegetables, fruits, and exceeds amounts of unhealthy items such as added sugar and solid fat.[1] In addition, 23% of children are considered overweight or obese.[2] Mindfulness techniques in parents have been correlated with improved dietary outcomes in children and a healthier family eating environment.[11,15-18] However, research specifically addressing mindful food parenting is mostly unexplored and it has the potential to improve dietary and mental health.

Research Questions and Hypothesis

Development and Validation of a Mindful Food Parenting Instrument (MFPI)

The first aim of this study was to develop and validate an instrument that reflects the theoretical framework drawn from current models of mindful eating, mindful parenting and

mindful food parenting. The instrument included five components: bringing mindful awareness to eating experience; making mindful food choices based on food preferences and health; creating awareness of the hunger and fullness experience; cultivating awareness of parent and child emotions and reactivity to emotions; and cultivating compassion for self and child.

Mindful Food Parenting and Dietary Outcomes

The second aim of this study was to explore the relationship between the components of mindful food parenting and young children's (4-8 years old) dietary outcomes (inlcuding the intake of vegetables and fruits, whole grains, added sugars, sweetened beverages, restaurant meals with waiter or waitress services, and meals from fast food establishments).

Hypothesis

Mindful food parenting was projected to be negatively associated with children's intakes of added sugars, sweetened beverages, restaurant meals with waiter or waitress services, and meals from fast food establishments. It was also expected to positively predict healthy eating behaviors in children, including greater fruit, vegetables, and whole grain intake. The MFPI was expected to measure if mindful food parenting impacted the dietary outcomes in children.

Research Question

Are the components of the mindful food parenting framework associated with eating behaviors in children, including fruit and vegetable intake, whole grains, added sugar, sugar-sweetened beverage intake, meals from restaurant meals with waiter or waitress services and fast food establishments?

Chapter II: Literature Review

Children's Diet and Weight in the United States

Nutritious eating is essential for growth, development and health during childhood and later in life. Experts agree that parents should aim to provide children with optimal physical and cognitive development, a healthy weight, food enjoyment, and reduced risk of chronic disease through appropriate eating habits and participation in regular physical activity.[24] However, children's daily consumption of fruits, vegetables, and whole grains falls short of the recommended amounts while exceeding energy intake from added sugars and solid fat.[1] It is likely that such elements in children's diets contribute to the current rate of childhood obesity; the rates of which are estimated at 23% among preschool age children. [2] Other eating habits, such as the frequency of eating out in fast-food chains and sit-down restaurants, has also been linked to higher body mass index (BMI).[25]

The presence of an elevated BMI percentile in childhood tends to continue into adulthood.[3] Childhood obesity can lead to adverse physical health consequences during childhood or later in life. Furthermore, obesity early in life can contribute to the onset of psychiatric and psychological disorders, as well as negative effects in the physco-social domain and the overall quality of life.[4] In terms of health consequences, childhood obesity has well documented longitudinal consequences that can start as early as childhood or later in adolescence or adulthood.[26,27] These consequences include: cardiovascular disease,[28,29] , type II diabetes, [30,31] non alcoholic fatty liver disease, [29,32] sleep apnea, [33,34] infertility, [35], asthma, [36,37] and orthopedic complications [28] among others. Meta-analyses on the physiological consequences of childhood

obesity have highlighted the relationship between childhood obesity and depression,[38] negative mood states,[38] poor self-esteem,[29,38] anxiety,[38] ADHD,[38] and overall lower quality of life.[38] Other issues reported in the same study, not often mentioned but related to childhood obesity, are the negative behavioral changes in the child. The traits observed include increased conduct issues (i.e. disruptive aggressive and destructive behavior, disobedience, physical and verbal abuse) conflicts with peers, attention span issues, and emotional symptoms.[38] The strength of the relationship of these symptoms was found to be stronger when obesity starts at a younger age (4-5 years old). Bullying and teasing are also a common finding in obese children. [38] Last, there is also a higher prevalence of eating disorders with early childhood obesity onset when compared to later onset.[39]

Parental Feeding

Beyond providing food, parents' feeding styles and practices, beliefs, and personal emotions all contribute to a child's diet quality, feeding behaviors and weight. A large body of research has looked into the relationship between these factors. Parental feeding styles that have been associated with positive outcomes include: parental modeling,[5-7] responsive feeding, [8] and healthy food availability at home.[5,40] On the opposite hand, feeding practices related to negative outcomes include food restriction,[7,9] permissive/indulgent feeding,[5] using food as a reward,[7] and emotional feeding.[11,12,41,42]

From an early age, children learn what, when and how much to eat based on the transmission of cultural and familial beliefs, attitudes and practices surrounding food and eating.[43] Thus, parental modeling is crucial in the development of eating habits. Positive parental

modeling has been positively correlated with fruit and vegetable intake,[5,6,44] and negatively associated with sugary drinks, less-nutrient dense foods,[6] soda consumption. [45] as well as preference for other high fat and high sugar foods. [40]

Recent guidelines have recognized responsive feeding as a protective measure against childhood obesity.[46] This parental practice encourages the child to eat independently and in response to hunger and satiety cues. Responsive feeding may encourage self-regulation in eating and support cognitive, emotional, and social development in young children.[47]

Additionally, the availability of healthy food at home has been positively associated with fruit/vegetable consumption,[45] and negatively associated with soda,[45] high palatable snack intake,[45] and foods high in fat and sugar. [40]

On the other hand, excessive food restriction has been positively associated with a child's preference for foods high in fat and sugar[7] and elevated BMI z scores.[5] Permissive feeding style is also associated with negative dietary outcomes, and is characterized by a high parental response to a child's requests with few demands to him or her.[48] This feeding style has been associated with higher intake of low nutrient dense foods[48] and elevated BMI z scores. [5]

Moreover, using food as a reward has the potential to undermine the healthy eating habits parents are trying to create in children. The practice has been seen as pervasive by well-respected professional organizations, including the American Academy of Pediatrics, the American Academy of Physicians, and the American Psychological Association as it might adversely affect health, learning, and behavior.[49] When caregivers use candy or non-nutritive foods as a reward, they are likely fostering children's desire for sweets and unhealthy foods.[49] In addition, using

food as a reward has been correlated with a children's preference for foods high in fat and sugar.[7] Studies also suggest that using food to reward success or good behavior results in an increased risk of binge eating and other types of eating disorders.[50] [50]

Lastly, the parents' own emotions can impact the children's diet quality and eating habits. Parental stress and depression have been linked to increased odds of parents engaging in pressure-feeding. This connection negatively impacts the proportion of home-made meals served.[41] Mothers' personal struggles with emotional regulation have been associated with emotional eating in children and adolescents that are overweight or obese.[11] A meta-analysis reported that maternal stress may reduce proactive parenting practices to reduce obesity or prevent weight gain, such as meal preparation or transportation to organized sports. Furthermore, it might decrease children's ability to learn self-regulation skills, such as controlling eating behavior. [12] In addition, higher levels of parental stress were associated with children and adolescents' disordered eating patterns through more controlling feeding strategies.[11] In a specific manner, parental stress has been correlated with the use of food as a reward, food restriction, and pressure to eat. In girls, the use of food as a reward was positively associated with emotional eating, and pressure to eat was negatively associated with overeating among girls in the middle/late stage of adolescence. In boys, overeating in the early stage of adolescence is associated with the food restriction.

Eating Competence

A well-known and respected parental feeding model is the eating competence model by Ellyn Satter.[51] The model is based on the effectiveness of a functional biopsychosocial process:

hunger as it relates to survival; appetite and the need for reward; and the biological propensity to maintain a stable body weight. The goal of this feeding method is to help children to become competent eaters, defined by Satter as one that has "1) positive attitudes about eating and about food, 2) food acceptance skills that support eating and ever-increasing variety of the available food, 3) internal regulation skills that allow intuitively consuming enough food to give energy and stamina and to support stable body weight, and 4) skills and resources for managing the food context and orchestrating family meals." [51] Satter also suggests that to achieve such a type of eater, a division of responsibilities between parent and child must occur. Parents are responsible for when and where the food is served and what is provided. Children are responsible for the amount of food they eat and whether or not to eat. Such a model provides children with structured opportunities to learn about eating in the context of personal autonomy. Division of responsibility has been correlated to a decreased nutrition risk in children measured with the NutriStep score.[52]

Competent eating has been correlated to better diet quality, including greater intake of fiber, vitamin A, vitamin E, vitamin C, most B-vitamins, magnesium, iron, zinc, and potassium.[53] Also, competent eaters have lower BMI, greater body weight satisfaction,[54] better quality of sleep,[55] and decreased risk of cardiovascular disease.[56] Furthermore, competent eaters reported greater parental modeling of healthy eating behaviors during meals as well as fruit and vegetable intake.[57] This eating style aligns well with mindful eating, and the mindful food parenting framework proposed in this study. Both methods aim to create eaters with a long-term positive relationship with food and their bodies in a context of nutritious and healthy eating.

Mindful Eating

Mindful eating generally refers to the application of mindfulness techniques to eating, including nonjudgmental awareness of internal and external cues impacting the desire to eat, and eating in response to those cues. A mindful eater focuses on internal hunger and satiety cues and eats in response to such physiological triggers.[21,58] An essential component of mindful eating includes the practice of being aware of the present moment while eating, focusing on the effect of food on the senses, and the physical and emotional sensations.[21] Mindful eaters create awareness of the process of eating by focusing their attention toward one's olfactory senses, salivary reactions, and the process of eating and chewing food.[59,60] The Center for Mindful Eating (TCME) developed a set of principles for this eating style.The principles state that mindful eaters are aware of the positive and nurturing opportunities that are available through food selection, preparation, and the respect to their inner wisdom. In addition, according to the principles, mindful eating encourages the selection of food that satisfies and nourishes the body while respecting food preferences without judgment. Lastly, mindful eaters identify and respond to hunger and satiety cues.[58]

Because mindful eaters are aware of all cues affecting their own eating behaviors and health, this technique can be a useful strategy to influence food consumption to maximize health and prevent diseases.[22] Mindful eating has been revealed useful in adolescents and adults, including improvements in diet quality and food choice,[61,62] weight management,[21,62] and energy intake.[61,62] Moreover, this technique has shown to be especially significant in the treatment of disordered

eating patterns such as binge, uncontrolled eating and impulsivity.[62-64] Positive findings have also been seen in emotional eating.[62,64]

A core component of mindful eating is the cultivation of awareness to the different internal and external aspects of eating. The components of mindful eating have been conceptualized by Alberts, Thewissen and Raes [21] as 1) Mindful eating (awareness of sensations such as taste); 2) Awareness of physical sensations (hunger, satiety, craving and stress); 3) Awareness of thoughts and feeling related to eating (e.g. inner self-talk, beliefs, judgments, expectations, diet rules, fear, sadness or guilt); 4) Acceptance and non-judgment of sensations, thoughts, feelings, and body; and 5) Awareness and step-by step change of daily patterns and eating habits.

Kristeller and Wolver[60] created a conceptually comprehensive foundation for mindfulness-based eating awareness for eating disorders (MB-EAT) that provides a strong framework applicable to other populations. For example, in one of the few mindful eating interventions in children and their parents, Alyson Wyle[65] reports the use of the MB-EAT to develop the curriculum with positive qualitative results. MB-EAT consists of four components.

Mindful Parenting

Mindfulness has been defined as a receptive attention to and awareness of present events and experience,[66] and involves being fully present from moment to moment,with full awareness of one's own emotional state and physical condition, as well as one's surroundings.[20] Mindful parenting is the application of mindfulness to parenting. At the core of mindful parenting is the practice of being fully present during parent-child interactions. By being present, parents are able

to pause and shift their awareness to focus on the present-moment parenting experience within the context of the long term relationship with their child. In mindful parenting, parents are aware of their own needs as well as the needs of their children, allowing for the possibility of self-regulation and thoughtful choice- making that can lead to the achievement of their parental goals. [23] Additionally, mindful parenting aspects of parental cognitions, attitudes, and affective reactivity in parenting interactions are integrated into one single higher construct.[17]

In order to achieve mindful parenting, Duncan, Coatsworth, and Greenber have proposed a five-dimension model of mindful parentig.[23] The first component of mindful parenting is listening with full attention to the child. This process involves listening to verbal and non-verbal cues (i.e. facial expressions, body language). By doing so, parents are more aware of their child's needs.[23] This component aligns well with the Institute of Medicine Early Childhood Obesity Prevention Policies that urges parents and caregivers to create a healthy eating environment conducive to children's hunger and fullness cues.[46]

The second component is nonjudgmental acceptance of themselves and their child. This component includes an awareness and acceptance of moment-to-moment parent and child interactions and acknowledges that parenting can be challenging at some points.[23]

The third component of mindful parenting is a parent's awareness of their own emotions as well as those of the child. A parent's own emotions can trigger automatic or inadequate behavioral responses.[23] By maintaining awareness and removing the judgment to their own emotions, parents can respond to the child's emotions without immediately reacting to them.[23]

Parenting around food can be extremely stressful. Young children often reject healthy foods. When parents are presented with a crying/emotional young child who refuses to eat nutritiously, parents might have a difficult time dealing with their own emotions and calmly parenting according to their goals.[15] A meta-analysis reported that parental stress may reduce proactive parenting practices that reduce obesity or prevent weight gain. Such practices include meal preparation or transportation to organized sports. Additionally, parental stress might decrease a child's ability to learn self-regulation skills such as controlling eating behavior.[41] Parental stress has also been reported to increase odds of parents engaging in pressure-feeding.[41]

The fourth component of mindful parenting is the greater self-regulation of the parent-child relationship. By bringing greater awareness to the relationship, parents can pause before acting and select a parenting practice that is in greater concordance to their parental goals and values.[23]

The fifth component is parental compassion for self and the child. This practice can alleviate distress. When parents have empathy towards themselves and the child when parenting goals are not achieved, parents can quickly focus their efforts into goal-oriented parenting.[23] It is possible that this component helps to decrease parental stress when parenting goals are not achieved.

Similar models have been proposed by other authors. One model measures mindful parenting in terms of being: more aware and present to their surroundings, physical sensations, and internal mental process; less judgmental; and more descriptive of their moment-to-moment experiences.[16] Another model suggests a six factor framework: listening with full attention,

compassion for child, non-judgmental acceptance of parental functioning, emotional non-reactivity in parenting, emotional awareness of child, and emotional awareness of self.[67]

A more recent model suggests a two-factor measure of mindful parenting. The first factor is parental self-efficacy and includes the following variables: nonreactivity in parenting (i.e. did you consider your feelings before disciplining your child); and parenting awareness (i.e. did you take time to think about your parenting; and goal-focused parenting (i.e did you believe the way you were parenting was consistent with best parenting practices). The second factor is being in the moment with the child and includes present-centered attention (i.e. did you carefully listen and tune into your child when you two were talking), empathic understanding of the child (i.e.did you understand your child's motives for their behavior), and acceptance (i.e. did you have fun and act goofy with your child).[68]

An extensive list of possibilities for the mechanisms underlying mindful parenting include: changes in attention, empathy, dysfunctional automatized interactions, cognitive fusion, insight, synchrony, and transformational changes in parents.[68] However, further research is necessary to determine the best mindful parenting model and/or the mechanism underlying the reported benefits of this parenting style.

In terms of dietary outcomes mindful parenting interventions have been correlated with improvements in parental stress[16] which has been associated with negative dietary outcomes [15], emotional eating, and overeating among children and young adolescents. [11] In addition, mindful parenting was correlated with more adaptive parent-child feeding practices (i.e. lower use of food as a reward, pressure to eat and monitoring).[11] A study among 726 dyads composed of a

mother or a father and their child (7 to 18 years old) examined the relationship between mindful parenting, parental stress, and children's emotional eating. Mindful parenting, or the use of mindfulness techniques when parenting, was negatively associated with children and early adolescent emotional eating through lower levels of parenting stress followed by less frequent use of food as a reward. Mindful parenting was also negatively associated with overeating among children. Furthermore, mindful parenting was correlated with more adaptive parent-child feeding practices (i.e. lower use of food as a reward, pressure to eat and monitoring).[11]

Furthermore, mindful interventions have been successfully associated with parents' creation of a healthier eating environment and diet quality for their children.[15] In general, mindful parenting interventions have reported different positive outcomes such as decrease in anxiety and distress[69], parental stress,[16] greater self-compassion,[16] personal growth over time,[16] and improvements in coparenting.[52,67] Mindful parenting has also been correlated with a more positive parent-child relationship, and greater parental satisfaction following interventions.[11]

Mindful food parenting

Just as mindful eating targets mindful and mindless eating, mindful food parenting explores mindless and mindful parent behavior related to children's food intake.[17] Mindful food parenting has been conceptualized as 1) present-moment awareness in the feeding context, 2) parent awareness of responsive and unresponsive feeding behaviors, 3) increased parental encouragement of children expressing when they are hungry and when they are full, 4) decreased parental emotional and behavioral reactivity in response to the child's requests for food.

Ultimately, mindful food parenting allows parents to feed their children nutritious food while respecting children's hunger and satiety as well as food preferences.[17]

Researchers have used the Kentucky Inventory of Mindfulness Skills to measure mindful food parenting. The subscales in the Kentucky inventory include: non-reactivity, observation, description, acting with awareness, and nonjudgmental acceptance.[17] Furthermore, it has been reported that mindful feeding was positively correlated with all factors of the Interpersonal Parenting Scale including parent-centered emotional awareness, present-centered awareness, nonjudgmental receptivity, and the ability to regulate reactivity. [17,70]

In novel research described in the unpublished dissertation of Molly Meers,[17] mindful food parenting negatively predicts the use of food to regulate a child's emotions and as a reward. In addition, mindful food parenting positively predicted parental encouragement of a well-balanced and varied diet for the child. There is also a correlation between this parenting style and the availability of healthy foods for the child. Moreover, mindful food parenting negatively predicted the consumption of fast foods, soda and salty snacks.[17] A different study among 535 adult parents reported that mindful food parenting was positively associated with parent-reported a child intake of fruits, vegetables, and whole grains. The study also found that mindful parenting was negatively associated with the intake of added sugar and sweetened beverages. In addition, mindful food parenting was correlated with lower parental BMI and greater healthy food availability in the home. However, mindful food parenting was not significantly associated with parent-reported child BMI percentile.[18] This technique may also result in parents paying more attention to their health-oriented feeding goals and associated strategies, leading to more positive

child dietary outcomes. It is also possible that mindful feeding promotes higher quality of parent-child communication and social bonding, which may increase the likelihood that children will be receptive and responsive to a parent's feeding strategies.[70]

A study designed to prevent childhood obesity through a mindfulness-based parent stress intervention with a nutrition and physical activity component, demonstrated that the intervention was significantly associated with the children BMI percentile after accounting for changes in positive and negative parenting. Children BMI in the mindfulness plus nutrition intervention group remained stable during the 8-week intervention period when compared with a control group who had an increase in BMI. The study also demonstrated increased parent involvement and decreased parental emotional eating rating during treatment.[15]

Qualitative research is drawn from Wylie[65] through a study conducted between third to fifth graders and their parents. This research is part of a larger intervention consisting of classes for parents, and classroom activities by trained college students with teachers present in the classroom. Furthermore, take-home assignments were sent home to be completed along with parents. The curriculum was developed based, in part, on principles and components of the Mindfulness-Based Eating Awareness Training.[60,71] For the qualitative data collection of this study, researchers collected monthly parent feedback surveys and information from four focus groups. Authors reported that some parents observed their children using mindful eating practices at home. For example, one parent noted that his child was saying, "I am not hungry" more often than he used to when snacking mindlessly before. Other parents started making an effort to buy and prepare healthier meals at home despite their busy schedules. Teachers reported

that after completing the curriculum, they were more likely to encourage intake of vegetables and fruits. Additionally, many students reported being more interested in mindful eating practices.[65] Preliminary research in the same group reported that mindless eating was significantly correlated with emotional eating, sugar cravings, consumption of sweetened beverages and salty snacks.[72]

In conclusion, mindful food parenting is a mostly unexplored technique. However, this novel feeding technique can increase parents' responsive feeding practices, improving children's dietary quality and long term relationship with food. For example, by focusing on awareness of verbal and non-verbal cues to hunger and fullness, parents can respond to cues appropriately. Moreover, by being aware of children's emotions, parents can avoid providing food when the child is not hungry and respond to the emotional need instead. In addition, non-judgmental acceptance of thoughts and feelings surrounding the child's request for food may decrease parents' reactivity to the request and act according to parental feeding goals. For example, when a child misbehaves because he or she wants an unhealthy snack, parents can pause and choose their actions calmly instead of reacting to the emotional state of the child. Furthermore, a parents' choice to acknowledge their own emotions allows them to pause and act with awareness.

Measurements of Mindful Food Parenting and Mindful Parenting

Currently, only one measurement of mindful food parenting exists-the Mindful Food Parenting Questionnaire (MFPQ)[17] and it targets mindfulness while parenting around food. Similar instruments measure mindful parenting. Considering that this study requires the

development and validation of an instrument to measure mindful food parenting, a detailed description of the mindful food parenting questionnaire and the interpersonal mindfulness in parenting scale are described.

Mindful Food Parenting Questionnaire (MFPQ)

The questionnaire was developed by Molly Meers [17] using the Kentucky Inventory of Mindfulness Skills (KIMS). Items from the four subscales of the inventory include: observing, describing, acting with awareness, and nonjudgmental acceptance. Items representing each component were used to create corresponding subscales in the context of food parenting. Non-reactivity was added to the subscale. Each subscale consisted of five to seven items with response options of never, rarely, sometimes, mostly, or often. Sample items included, "When my child asks for food I pause to think about whether they are actually hungry before immediately reacting." and "I am embarrassed if my child whines for food in public."[17]

To complete the questionnaire, authors added a non-reactive subscale identified by Baer, Smith, Hopkins, Krietemeyer, and Toney.[17] The MFPQ focuses on psychological aspects of mindfulness.

Content Validity for MFPQ items

Content validity of the MFPQ items was conducted by recruiting ten doctoral students in clinical and developmental psychology who were familiar with the topic. Each expert was asked to sort each of the 31 items into one of the five subscales (observing, describing, acting with awareness, nonjudgmental acceptance,or non-reactivity) they thought best represented the item. Standardized instructions that included a description of each subscale were provided. Results

conveyed that, of the original 31 MFPQ items, experts correctly classified the items 70.3% of the time. Six items were removed due to an interrater agreement of less than 60% for the subscale for which it was written. The final questionnaire consisted of 25 items, correctly classified 78.4% of the time. An additional two items were added based on a non-reactivity subscale. As a result, the Exploratory Factor Analysis of the MFPQ included 27 items.[17]

Exploratory Factor Analysis (EFA)

EPA was conducted by recruiting 184 participants through Mechanical Turk, an online resource provided by Amazon that has traditionally been used for "crowdsourcing" labor-intensive tasks. Participants were invited through the MTurk forum via "hits," or invitations to participate. The requirements for participation included being a mother of a 3 to 6 year-old child for whom she had the primary responsibility, speaking English proficiently, and being a citizen of the United States. Once the hit was accepted by the participant, the mother was linked to a letter of consent and study instructions available on an online survey website. If she met the requirements, the mother was included in the study and received $1.00 for her time. The participant was prompted to answer questions about demographic information, the mindful parenting scale, intrapersonal mindfulness, general feeding practices, food intake, and feeding for health.[17]

An exploratory principal components analysis with oblique promax rotation was conducted to determine the factor structure of the proposed MFPQ. Items with factor loadings less than 0.40 or with multiple factor loadings greater than .40 were removed from the final

model. The result was a 14 item questionnaire composed of four factors with eigenvalues greater than one. The four-factor model more closely resembled the factors of interpersonal mindfulness in parenting scale than the factors in the Kentucky Inventory of Mindfulness Questionnaire.[17]

Confirmatory Factor Analysis (CFA)

The aim of this data collection was to determine if the proposed factor structure of the MFPQ was a good fit for the data. One hundred and ninety four participants were recruited through MTurk using the same procedures described above. AMOS and SPSS were used to analyze the data. Mindful food parenting was measured using the adjusted scale developed after the EFA. Cronobach's alphas for this data collection were as follows: overall (0.75), present-centered awareness (0.76), present-centered emotional awareness (0.66), nonreactivity (0.50), and nonjudgmental receptivity (0.34). Mindful parenting, intrapersonal mindfulness, general feeding practices, food intake, and feeding for health were measured in this round of data collection. Results from the CFA suggest that the proposed factor structure of the MFPQ was a poor fit for the data. Because it was a poor fit, subsequent items were dropped from the questionnaire, improving the fit. While the overall CFA revealed that the MFPQ items were not an overall fit for the data, the nonjudgmental receptivity reflected a good fit. In addition, the Cronbach's alphas for the present-centered awareness and present-centered emotional awareness were also good fits. Thus, further analyses were conducted with these three subscales. Finally, follow-up analyses were conducted on the Regulate-Reactivity (non reactivity) subscale given the improvement in the inter-item reliability following the removal of two items.

A subscale of the MFPQ, a four-factor questionnaire was used in two pioneer published studies correlating mindful food parenting (mindful feeding) and children's dietary outcomes [9,19]. The questionnaire measures the parent's mental presence while feeding their child and was one of the subscales developed by Meers. The item included: 1) " I tend to feed my child while I am doing many other things" (Reverse coded); 2) "When I feed my child, I am often distracted by other thoughts" (Reverse coded); 3) "When I am feeding my child, I am completely focused on what I am doing;" and 4) "I rush through meals with my child without really paying attention to them" (Reverse coded). A five-point response scale (1 =never, 5 =often) was used to measure the data. The internal consistency alpha coefficient in the study was 0.75 compared with Meers coefficient of 0.73.[18,19]

Interpersonal Mindfulness in Parenting Scale (IEM-P)

The IEM-P scale was developed in 2015 in an unpublished dissertation and measured three factors in mindful parenting: present-centered awareness and attention (4 items); non-judgmental receptivity (3 items); and non-reactivity (4 items).[73] The first step to validate the IEM-P scale was to examine distributional properties and intercorrelations of the ten scale items. As a result, a new dimension was added to the scale in order to distinguish between cognitive and affective aspects of present-centered awareness and attention. In the next step to test the IEM-P scale a series of confirmatory factor analysis (CFA) models were conducted using a sample size of 375 mothers. As a result of the first CFA more items were removed resulting in better statistical convergence, nonetheless the model was not a good fit for the data. Thus, a third model was constructed including two separate factors for present-centered attention and

emotional awareness. The model still was not a good fit for the data resulting in the removal of additional items. One last CFA was conducted to further assess the validity and reliability of the model solidifying the scale.[73]

Last, although the factor loading provided information about reliability, Cronbach's alpha coefficients along with Person's correlation were conducted for each of the two items subscale.[73]

A review of validation of instruments was conducted as this study seeks to develop and validate a mindful food parenting instrument (MFPI) focused on both psychological and operational aspects of parenting around food. The instrument will be partially based in the Mindful Food Parenting Questionnaire.

Validating Surveys

There are several steps for evaluating new proposed surveys, and while methodology to measure each step might vary, the concepts remain similar. The steps include: content validation by experts, face validation, data preparation, content validity, and content reliability.

Content validation by experts has been defined as "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose."[73] The systematic model used to conduct content validation is composed of six steps: preparing content validation form; selecting a review of panel experts; conducting content validation; reviewing domain and items; providing score for each item and; calculating a content validation index.[74]

During the face validation step, researchers ensure that the respondents' understanding of the question aligns with the study goals.[75] Data preparation determines how the researchers will prevent and/or manage missing data and outliers.

The following step is content validity. The first goal in this step is to identify irrelevant questions by ensuring that the independent variables have a minimum level of correlation with measured dependent variables.The second goal seeks to identify highly correlated independent variables. If there is a high degree of correlation between variables, it might be possible to merge the questions to shorten the length of the questionnaire.[75]

The last step, content reliability, can be conducted by re-testing participants or by calculating the internal consistency. The test can identify variables that may reduce the inter-correlation between the question variables. If possible, such variables should be omitted.[75]

Current Theoretical Models Mindful food parenting model

In an unpublished dissertation by Molly Meers,[17] mindful food parenting (mindful feeding) was conceptualized in four dimensions: present-moment awareness in the feeding context; parent awareness of responsive and unresponsive feeding behaviors; increased parental encouragement of children expressing hunger and fullness; and decreased parental emotional and behavioral reactivity in response to the child's requests for food. Based on this model, researchers developed a mindful food questionnaire encompassing four areas of the Kentucky Inventory of Mindfulness Skills. The questionnaire was used to correlate mindful food parenting and children's dietary behaviors.[17]

Mindful parenting model

Duncan, Coatsworh and Greenberg [23] proposed a mindful parenting model consisting of five dimensions: The first dimension is listening with full attention to the child, which involves parents listening to what the child is verbally saying but also the no-verbal cues (i.e. facial expressions and body language). The second component is a parent's nonjudgmental acceptance of themselves and their child. This component includes an awareness and acceptance of moment-to-moment parent and child interactions and acknowledges that parenting can be challenging at some points. The third component is parental awareness of their own emotions as well as those of the child. A parent's own emotions can trigger automatic or inadequate behavioral responses. When the parent is aware of their own emotions and accept them without judgment, parents can respond to the child's emotions without immediately reacting to them. The fourth component is greater self-regulation of the parent-child relationship. The fifth, and last, component is parental compassion for self and the child. This practice can alleviate distress. When parents have empathy towards themselves and the child when parenting goals are not achieved, parents can quickly focus their efforts on goal-oriented parenting. [23]

According to the authors, the model proposes that parents who can remain aware and accept their child's needs through mindfulness can create a family context that is more conducive to a short and long term satisfaction and enjoyment in the parent-child relationship.[23]

Mindfulness-Based Awareness Training

The Mindfulness-Based Awareness Training (MB-Eat) model has four main components. The first component is cultivating mindfulness, described as the ability or capacity

to direct attention. This component includes the practice of being aware, disengaging reactivity, and encouraging non-judgmental behavior. This practice cultivates the capacity to bring mindfulness into daily experience, including eating. The second component is cultivating mindful eating by bringing awareness to eating experience; taste experience and food enjoyment. This component includes practicing awareness of the hunger experience and fullness experience, making mindful choices based on both preferences and health. Holistically, the second component encourages the non-judgment eating experience. The third component is cultivating emotional balance by creating awareness of emotions and emotional reactivity, managing emotions in a healthy manner. The last component is the cultivation of one's acceptance of their body; recognition of anger in self and others as well as exploring feelings and thoughts toward self and others.[60]

Chapter III: Theoretical framework

This study proposes and elucidates a new model of mindful food parenting. The model draws from previously described frameworks of mindful food parenting, mindful parenting and mindful eating. Table 1 consolidates key theoretical principles and concepts to preface a further explanation of each component.

Table 1: Mindful Food Parenting Theoretical Model

Component	Principles	Practices
Bringing mindful attention and awareness to the eating experience	Cultivate an external environment that leads to mindful eating.	● Age appropriate practices to set the eating environment (i.e. table setting for young children) ● Hand washing to transition children to meal time ● Environmental music ● Removal of all electronic stimuli such as television, tablets and phones. ● Family meals
	Parental present moment awareness	● Focus the attention to the parent-child interaction ● Avoid feeding the child while distracted or doing other things ● Allocate adequate time to eat
Making mindful food choices based on food preferences and health	Parental awareness of food offered to children	● Parents make conscious food choices for their children ● Parents make nutritious food available at home based on family food preferences and health
Awareness of hunger and fullness experience, and awareness	Parental awareness of hunger and satiety cues.	● Parents listen with full attention to the verbal hunger and satiety cues but also the no-verbal cues (i.e. facial expressions, body language) ● Parents are responsible for when, where and what to eat. Children are responsible for

of reactivity to the experience		whether to eat or not and how much.
	Parental awareness of reactivity to the experience	● Parents are aware of how they react to hunger and satiety cues. ● Parents teach and encourage the child to identify and respond to hunger and satiety cues
Cultivate awareness of parents and child emotions and reactivity to such emotions	Parental awareness of their own emotions as well as those of the child	● Parents are aware of how food influences their children's behavior ● Parents are aware of how their own emotions affect when and what they feed their children ● Parents notice how food affects their child's emotions
Cultivate compassion for self and child	Parental awareness and compassion for self and child when parenting around food	● Parents are aware of their distress when parenting around food ● Parents are able to let go of stressful thoughts related to parenting around food and focus on parenting goals

Component 1: Bringing Mindful Awareness to Eating Experiences

Creating an external and internal environment that leads to focused attention to mealtime is essential to achieve parental goals related to children's dietary outcomes. According to the ecSatter perspective, to support adequate nutrition, it is essential to establish a positive, confident, relaxed, comfortable, and flexible attitude about eating. Such attitudes allow to focus the attention on the outer and inner experiences of eating.[51]

Sub-component 1: Create an external environment that leads to mindful food parenting

A physical environment can impact young children during meal times. For example, the presence of television or other electronic distractions during meals have been negatively correlated with the emotional atmosphere of the meal[74] paired with the overall dietary quality[13,75]

In addition, the presence of electronic devices have been positively associated with serving fast food for family meals.[74] Family meals have also been correlated with a higher diet quality in children.[76-78]

Another element of the physical environment is the availability of healthy food, [79] which has been correlated with positive dietary outcomes in children.[78,80]

Thus, it is possible that creating a positive physical environment during mealtimes can focus children's attention on meals. A physical environment could include cooking to alert senses in anticipation of meals, table setting, hand-washing and removal of all electronic stimuli such as television, tablets and phones to create awareness of the meal experience.

Sub-component 2: Parental present moment awareness during mealtimes

Parents who focus their attention and are present in the moment are likely to be able to capture the child's emotions, behaviors, and hunger/satiety cues. As a result, parents are able to react appropriately to such cues. Parental present moment awareness includes listening with full attention to verbal and non-verbal communication with the child, which can help the parents to

be more fully aware of the child's needs.[23] The practice also includes parental full attention during meal time and avoiding feeding the child while distracted by other thoughts or actions.

Component 2: Making mindful food choices based on food preferences and health

Availability of healthy foods at home is one of the parental feeding practices that leads to better diet outcomes in children. Such practices include fruit and vegetable intake.[74,78] Parents who are more aware of the food served at home are more likely to offer healthy food, resulting in better dietary outcomes in children. However, it is important to honor the children's food preferences to balance meals and promote a good environment during mealtimes. It has been reported that parents who respect their children's choices reveal that they had children who were less likely to be food responsive and/or to emotionally overeat.[81] While all foods fit into a well-balanced diet, it is important to distinguish between respecting children's food choices and permissive/indulgent feeding.

Component 3: Creating awareness of the hunger and fullness experience

Most children possess the innate ability to regulate food intake, however this ability is often lost overtime if awareness of physical cues of hunger and fullness are dismissed. Parents, in their desire to meet dietary guidelines or due to their perceived concept of adequate eating, ignore the child's needs. Furthermore, this can lead to children learning to ignore their own needs. Mindful food parenting involves listening with full attention to what the child is saying, paying attention to the non-verbal cues related to hunger/fullness, and responding appropriately. Parents that are mindful, are able to listen to both the content of the conversations as well as the

child's tone of voice, facial expressions, and body language. Such ability enables them to successfully detect their child's needs.[23] This component aligns well with the Institute of Medicine Early Childhood Obesity Prevention Policies that urges parents and caregivers to create a healthy eating environment conducive to children's hunger and fullness cues. [46] Furthermore, parents should help their children understand such cues to help them develop a life-long healthy relationship with food while most likely maintaining a healthy weight and good health.

Component 4: Cultivating awareness of parent and child emotions and reactivity to emotions

Parental emotions can trigger automatic or inadequate parental feeding practices. For example, parental stress and depression has been associated with increased odds of parents engaging in pressure-feeding and has been reported to negatively impact the proportion of home-made meals served.[12] Maternal stress has been reported to decrease proactive parenting practices to reduce obesity or prevent weight gain such as meal preparation or transportation to organized sports. Furthermore, it might decrease a child's ability to learn self-regulation skills such as controlling eating behavior.[12] Mindful parenting was negatively associated with children and early adolescent emotional eating through lower levels of parenting stress followed by less frequent use of food as a reward. Mindful parenting was also negatively associated with overeating among children.[11]

Strong emotions have a powerful influence on igniting cognitive processes and behaviors that negatively affect parental practices. If parents are able to identify their own as well as their child's emotions, they can pause and make a conscious choice about how to respond rather than automatically react.[23]

Moreover, mindful parenting reflects a parent's willingness and ability to tolerate strong emotions through accepting their emotions thus allowing them to be more fully present during their interaction with the child.[23]

Component 5: Cultivating compassion for self and child

When parents have empathy towards themselves and their children and their feeding goals are not achieved, parents can quickly focus their efforts into goal-oriented parenting around food. Through compassion to self and the child, a mindful parent will seek to alleviate their own distress and that of the child. A self-compassionate parent avoids self-blame when parenting goals are not met, which may allow reengagement in pursuit of such parenting goals.[23] Parents who believe they are competent, interact with their children in a manner that promotes effective developmental outcomes.[82] However, parents are often their own harshest critics. A mindful approach to parenting may lead to greater acceptance of their own efforts to achieve desired parental goals rather than focus on outcomes,[23] considering that parenting around food can be extremely stressful. When parents are presented with a crying/emotional young child who refuses to eat nutritiously, parents might have a difficult time dealing with their own emotions

and calmly parenting according to their goals.[15] Healthy eating is a life-long process, and while it is built one meal at the time, it can take many failures before achieving successful outcomes.

Chapter IV: Methods

This study was conducted to develop and validate a MFPI focused on both psychological and operational aspects of parenting around food. A second aim of the study was to use the newly developed tool to measure the correlation between mindful food parenting and children's dietary outcomes. Institutional Review Board (IRB) approval was obtained prior to data collection.

Development and validation of the Mindful Food Parenting Instrument (MFPI)

The MFPI reflected the theoretical framework drawn from current models of mindful eating, mindful parenting and mindful food parenting. The instrument included five components: bringing mindful awareness to eating experience; making mindful food choices based on food preferences and health; creating awareness of the hunger and fullness experience; cultivating awareness of parent and child emotions and reactivity to emotions; and cultivating compassion for self and child.

The instrument developed for this study includes several questions from the tool developed by Molly Meers in an unpublished dissertation.[17] However the overall structure more closely resembled the mindfulness-based awareness training for binge eating disorder (MB-EAT).[60] Additionally, the instrument contained components from a mindful parenting model by Duncan, Coatswork and Greenberg,[23] Additional questions were included to explore all components of the model.

The MFPI measured mindful food parenting on a scale of one to five, with one representing “never”, and two, three, four, and five representing rarely, sometimes, often, and

always, respectively. The Mindful Food Parenting score was calculated by adding up the values corresponding to each question. Four questions (2, 3, 6 and 7) were reverse scored. Refer to appendix A for a copy of the final version of the MFPI.

This study consisted of several steps to validate the MFPI. Such steps included content validation by experts, face validation, content validity, and content reliability.

Content validation by experts

The content validation by experts consisted of six parts: the creation of the content validation form, selection of expert panel, conducting content validation, review domain and items, providing score for each item and calculating scores.[83]

Part 1: Content validation form

A content validation form was developed to provide experts with clear expectations and understanding of the task.[83] Experts reviewed and rated each item on its relevance and clarity using a four-point Likert scale (1–4). Scores on relevance were used to generate a content validity index (CVI) while clarity was used to pinpoint disagreement in the questions.

Part 2: Selection of Expert Panel

Experts were recruited from the Florida Academy of Nutrition and Dietetics, South Florida Academy of Nutrition and Dietetics and personal contacts. All experts were Registered Dietitians with expertise in mindful eating. No other criteria was required. A total of ten surveys were completed. However, two surveys were eliminated as respondents stated that they were not Registered Dietitians or mindful eating experts.

Part 3: Conducting content validation

For this study, the link to the online instrument was sent to experts via email. The survey was anonymously answered using Qualtrics, an online survey system.

Part 4: Review domain and items

The experts were asked to critically review the domain and its items before providing a score on each item. Experts were encouraged to provide comments to improve the relevance of the items to the targeted domain, which are later utilized to evaluate the questions in the MFPI. The degree of relevance was: 1 if the item was not relevant to the measured domain; 2 if the item was somewhat relevant to the measured domain; 3 if the item was quite relevant to the measured domain; and 4 if the item was highly relevant to the measured domain.[83]

Part 5: Providing score for each item

After completing the review of the domain and items, the experts were requested to score each item independently based on the relevant scale.

Part 6: Calculating scores

First, the relevance rating of each item was reviewed. Item content validity index (CVI) scores were calculated and then compared against accepted CVI scores. CVI was calculated for each item (I-CVI) and for scale (S-CVI). By definition, I-CVI is the proportion of experts giving items a relevance rating of 3 or 4 and it was calculated by dividing the agreed item by the number of experts.[83] S-CVI is the average of scores for all items on the scale or the average of proportion relevance judged by all experts. S-CVI was calculated by dividing the sum of I-CVI scores by the number of items. CVI was compared against accepted CVI scores.[83]

Face Validation

To ensure that the parents' understanding of the questions aligned with study goals,[84] a group of parents evaluated the instrument for clarity and understanding.

Characteristics of participants and recruitment method

Inclusion criteria established for the study required being a parent of a 4 to 8 year-old child for whom the parent has the primary responsibility, speaks English proficiently, and resides in the United States. The exclusion criteria included being less than 18 years of age.

Participants were invited through the Mechanical Turk (MTurk) forum, a reliable online survey distributor, via "hits" or invitations to participate. Inclusion criteria was listed in the hit description. To maximize the quality of the participants of the study MTurk was set to require parents to have a high hit acceptance rate and to reside in the United States. Once the hit was accepted, the parent was linked to complete the study in Qualtrics, an online survey service. First, the parents reviewed and acknowledged a letter of consent and pertinent questions to establish eligibility for the study. If the parent met the requirements, he or she was included in the study. The survey was completed in Qualtrics, an online survey service. Participants were compensated for their time.

Procedure

Initially, 13 parents completed the instrument to review each item based on clarity and understanding (Yes or No). The instrument included text boxes for parents to provide reasons for unclear or difficult to understand items. A separate group of 10 parents reviewed the

questions after questions were modified the first time. Item content validity index (CVI) scores were calculated and then compared against accepted CVI scores.

Content validity and reliability

Only one group of parents was necessary to conduct content validity and reliability. However, as a larger data set was available from a second group,therefore this study included two samples.

Characteristics of participants

The inclusion and exclusion criteria was the same throughout the study. The number of parents for the first group was calculated based on the common methodology of using a subject to item ratio.[85] In a meta-analysis reviewing publications about sample size used to validate a scale, 92% of the articles displayed a subject to item ratio equal or greater than two, whereas 25% had a ratio equal or greater than 20. About 90% of the articles had a sample size $\geq$100, whereas 7% had a sample size $\geq$1000 . Sample size was used to validate a scale: a review of publications on newly-developed patient reported outcomes measures. The survey contained 20 questions, and a sample size of 52 was obtained. Participants' inclusion criteria and recruitment method was the same as during face validation.

The number of parents for the second group was determined using the Qualtrics calculator using a confidence level of 95% and an estimated population size of 28 million children, resulting in an estimated sample size of 385 parents. The estimated population was determined based on the number of children 5 to 11 years old in the United States.[86]

A random sample of 402 parents was recruited using the same crowdsourcing platform, Amazon Mechanical Turk (MTurk), described above. Also inclusion and exclusion criteria stayed the same.

Procedure

After the parent accepted the hit, reviewed informed consent and answered eligibility questions, he or she was prompted to answer questions about demographic information and to complete the MFPI. Each question of the instrument was answered using a scale of one to five, with one representing never, and two, three, four, and five representing rarely, sometimes, often, and always, respectively. Parents also completed a dietary screener questionnaire[87] and questions to assess intake of meals away from home.

Due to the nature of data collection used to validate the instrument, this study used construct validity. The individual scores were compared against the score to identify irrelevant questions. The Cronbach alpha test was calculated in SPSS to assess reliability.

Mindful Food Parenting Instrument (MFPI) and Dietary Outcomes

The second aim of this study was to explore the relationship between the components of the MFPI and young children (4-8 years old) and dietary outcomes (intake of vegetables and fruits, whole grains, added sugar, and sweetened drinks, restaurant meals with waiter or waitress services, and meals from fast food establishments.

Characteristics of participants

The inclusion and exclusion criteria reminded me of the same. The number of parents was determined using the Qualtrics calculator using a confidence level of 95% and an estimated population size of 28 million children, resulting in an estimated sample size of 385 parents.

A random sample of 402 parents was recruited using the same crowdsourcing platform, Amazon Mechanical Turk (MTurk), described above. Also inclusion and exclusion criteria stayed the same.

Procedure

This portion of the study used the same recruitment platform and procedure to complete the online survey. Parents completed questions about demographics, the MFPI, a dietary screener questionnaire and questions aimed to determine the frequency of meals in sit-down restaurants and fast food establishments.

Study Design

An observational, cross-sectional, study was conducted to explore the correlation between

mindful food parenting constructs and children's dietary outcomes.

Measuring Instruments

Mindful Food Parenting Instrument (MFPI)

Mindful food parenting was assessed via the instrument developed for this study.

Dietary Outcomes

Diet was measured using the self-administered Dietary Screener Questionnaire (DSQ).[87] The self-administered, short screener asks about the frequency of consumption in the past month of selected foods and drinks to better understand intakes of fruits and vegetables, dairy/calcium, added sugars, whole grains/fiber, red meat and processed meat. The screener asks about the frequency of food consumed in the past 30 days and responses are given as a rate (number of times consumed per time unit-day, week, or month). Based on the response, the screener asks follow up questions about the subtype of foods consumed by the respondent. For example, if the participant responds yes to drinking milk, the screener will ask the type of milk consumed (whole, reduced-fat, low-fat, fat-free, soy or other).[87] DSQ does not include questions about portion sizes. The DSQ has been found to be a useful tool to collect information regarding dietary outcomes and was used to collect data from NHANES 2009-2010 survey. Validation of the tool showed that there were small differences between the screener and multiple 24 hour recalls (24h recall). Differences in mean were less than 2% and differences in prevalence were less than 16%. Some diet components were better estimated than others. For example, screener

estimates of total added sugars and fruits agreed more closely with 24-h recalls than did estimates for other food components, and the reverse was true for fiber and whole grains.[88]

Frequency of Meals from Restaurants and Fast Food Establishments

Frequency of meals away from home was measured by asking additional questions adapted from the National Health and Nutrition Examination Survey Flexible Consumer Behavior Module.[89] The survey included in this study asked parents about the number of restaurant meals with waiter or waitress services, and meals from fast food establishments consumed in the past 30 days.

Data preparation

Surveys with inappropriate answers or completed in under five minutes were not considered for the study. An example of inappropriate answers would be the use of random words in text entry, not pertinent to the question asked.

Missing data

Missing data were prevented by setting up the online survey in which participants were required to enter a response to one question before they could move on to the next, except for questions of weight and height for them and their children.

Parents Body Mass Index (BMI)

BMI was calculated by dividing weight in kilograms by height in meters square.[90] For the BMI of parents, extreme outliers were removed. BMI values were considered extreme if they were less than 16 kg/m^2 or more than 60 kg/m^2. For the validation of the MFPI, 3 observations

were eliminated based on extreme BMI values or missing data. For the second aim of the study, association between MFPI total score and dietary outcomes, a total of 28 observations were excluded.

Children's BMI

Children's height and weight were converted into BMI-for-age percentiles using CDC children's BMI tool for schools. This tool computes the BMI and BMI percentiles for individual children in a group using height and weight measurements, sex, children's age and date of measurement information entered or imported from spreadsheet or data file. Children were classified according to the CDC weight status category of percentile range: underweight, less than 5th percentile; normal or healthy weight, 5th to less than 85th percentile; overweight, between 85th and 95th percentile; and obese 95th percentile or greater.[91]

Parents' reported weight and height for their children were significantly inaccurate. The BMI percentile was calculated for the children and 54% were considered extreme outliers by having BMI percentiles of 1% or less or 99% or over. Considering that the data is not essential to the study, it was not used.

MFPI scores

To compare mindful food parenting scores with dietary outcomes, the MFPI was divided in tertiles as follows: below 48 was considered low mindful food parenting; 48 to 53 medium mindful food parenting; and 54 and above high mindful food parenting. One hundred and thirty three parents were considered to have low mindful food parenting skills, 127 medium, and 117

high. Content reliability and validity were reassessed considering the sample size was larger than in study aim one.

Dietary Outcomes

Frequency of consumption of all food groups was converted into daily equivalents using the calculation provided by the National Cancer Institute.[92] Once daily equivalents were calculated, the number was multiplied by 7 to provide the weekly intake. In addition, food groups were further organized in the following categories: added sugars, added sugars from sweetened beverages, fruits and vegetables, and dairy. These categories were adapted from the dietary factors listed in the same resource. [93]

Data Analysis

Descriptive statistics was conducted using SPSS. Frequencies and percentages were calculated for the parents' characteristics including gender, family race, income levels, education and BMI. Means and standard deviations were calculated for parents' and children's age.

Due to the nature of data collection used to validate the instrument, this study used construct validity. The individual scores were compared, using correlations, against the total score to identify irrelevant questions.

To assess reliability of the MFPI, the Cronbach's alpha test was calculated using SPSS. After calculating the test with all the questions, those questions that lowered the Cronbach score were eliminated and a new Cronbach's alpha test was performed to confirm that the results were closer to an acceptable level. The elimination of questions continued until Cronbach's alpha of at

least 0.70 was achieved. It has been suggested that an acceptable Cronbach's alpha ranges from 0.70 to 0.90. Questions can lower the level due to poor inter-relatedness between items or heterogeneous constructs. On the opposite side, if the alpha is too high, it might suggest that some items are redundant.[94] Considering this study had two samples, this procedure was done for the first sample and using the MFPI developed, data from a second sample was collected. A second reliability test was conducted in the same manner described above.

Bivariate correlation analysis using Spearman's rho was conducted to examine the relationships between MFPI total score and dietary outcomes, including meals in restaurants and fast food establishments. A one-way ANOVA was conducted to compare dietary outcomes by tertiles of MFPI score.

Chapter V: Results

Development of a Mindful Food Parenting Instrument (MFPI)

Content validity by experts

A total of ten experts completed the MFPI. However, two experts were eliminated as respondents stated that they were not Registered Dietitians or mindful eating experts. The relevance rating of each item in the surveys was reviewed. The item content validation score (I-CVI) of all questions was between 0.88 and 1.0, therefore meeting the required score of 0.83, for this number of experts.[83] The scale level CVI (S-CVI) score was 0.93. Twenty questions, from a total of twenty five, had a universal agreement score.

Clarity was used to pinpoint disagreement in the questionnaire structure. Researchers used the degree of clarity, as well as the experts' comments to improve the question structure. One question was eliminated and the language of one question changed. The question eliminated was “Usually, when I have stressful thoughts about how my child is eating, I am able to observe them without reacting.” Other questions were further explained in the questionnaire to improve clarity. The MFPI sent to parents contained 25 questions.

Face Validation

Thirteen parents were recruited from Amazon MTurk for evaluation of instrument clarity and understanding. After comments from parents, questions were modified to improve clarity and make them easier to understand. One question was eliminated as parents found it difficult to understand. The question was “I criticize myself or my child for not achieving my parenting

goals about food." Because this question and the question eliminated during experts review were the only questions in the fifth component "cultivating compassion for self and child", this component was eliminated. An additional ten parents completed the survey. The item content validity index was between 0.82 and 1.0 for both clarity and understanding. No further questions were modified significantly in the second parental review.

Content Validity and Reliability

Participant characteristics

The first set of parents consisted of 52 parents of children aged 4-8 years old who completed the MFPI. The responses of three parents were eliminated for inappropriate or inaccurate answers. The age of the parents ranged in age from 23 years to 47 years (mean = 33; standard deviation = 5.91). The parents mean BMI was 26.7 with a standard deviation of 5.

The parents who participated in the second group ranged in age from 18 years to 65 years (mean=35, standard deviation=7.88). The mean age of children was 5.4. One hundred and eighty five children were female and 194 males. It is worth noting that among parents, gender was 194 females and 185 males while gender in children were 185 females and 194 males. See Table 2 for information on gender, family race, income levels, education and BMI. The mean age of the children was 5.65.

Table 2: Demographic characteristics and BMI of parents who participated in the development of the Mindful Food Parenting Instrument (MFPI)

Variable	Frequency (N)		%	
	Group 1	Group 2	Group 1	Group 2
Race				
White	37	287	75.5	75.3
African American	6	54	12.2	14.2
Hispanic	3	23	6.1	6.0
Asian	3	15	6.1	3.9
Income				
< $15,000	2	5	4.1	1.3
$15,000- $35,000	2	35	4.1	9.3
$35,000-$55,000	13	99	26.5	26.0
$55,000-$75,000	12	114	26.5	29.9
$75,000-$95,000	12	52	24.5	13.6
.> $95,000.	7	2	14.3	< 1
Gender				
Female	22	194	44.9	50.9
Male	27	185	55.1	48.6
Income				
High school graduates or equivalent	5	18	10.4	4.5
Some college	5	38	10.4	10.0
College graduates	28	222	58.3	58.3
Master's degree	9	92	18.7	24.1
Doctorate degree	1	3	2.1	< 1
BMI				
Underweight	2	12	4.2	3.4
Normal weight	17	156	36.2	44.3
Overweight	15	125	31.9	35.5
Obese	11	59	23.4	16.7

Content Reliability

The Cronbach alpha test was calculated in SPSS to assess reliability. The result was 0.591. After deleting three questions (16, “It is okay if my child wants to eat more”; 15,“it is okay if my child refuses to eat”; and 20, “I criticize myself and/or my child if he/she does not eat the way I think is best”) the Cronbach alpha test increased to 0.717.

For the second group, the initial Cronbach alpha was 0.757. Two questions that were questionable in the first aim of the study were deleted (question 9 “I choose meals based only on preference” and question 10 “I choose meals based only on health”). After removal, Cronbach alpha test increased to .797. Cronbach alpha for component one of the scale was 0.766, for component 2 was .733, and component 3 was .733.

Content Validity

Due to the nature of data collection used to validate the instrument, this study used construct validity. The individual scores were compared against the total score to identify irrelevant questions. Except for one, all questions had a significant correlation to the score. Question 9 was: “I select food based only on my family’s preferences.” This question had a correlation of $r = -0.015$ and $p = 0.917$. The question was not deleted as it was part of a group of questions assessing selection of family meals. No further questions were merged or deleted.

Mindful Food Parenting Instrument and Dietary Outcomes

The second aim of this study was to explore the relationship between the components of the mindful food parenting model and young children (4-8 years old) dietary outcomes (intake of vegetables and fruits, whole grains, added sugar, and sugar from sweetened-beverages drinks, meals away from home intake and already prepared meals).

A random sample of 402 parents of children aged four to eight years old completed the MFPI through Amazon Mechanical Turk (MTurk). After removing MFPI who were missing more than one question or had inappropriate answers, a total of 380 were used for this study. The requirements for participation included being a parent of a 4 to 8 year-old child for whom participants have the primary responsibility, speak English proficiently, and are a resident of the United States.

Characteristics of Participants

The parents who participated in the current study ranged in age from 18 years to 65 years (mean=35, standard deviation=7.88). See Table 3 for information on gender, race, income levels, and education.

The children of the parents recruited in the current study ranged in age from 4 years to 8 years (mean = 5.43 and standard deviation=1.4). One hundred and eighty five children were female and 194 males. It is worth noting that among parents, gender was 194 females and 185 males while gender in children were 185 females and 194 males.

Table 3: Demographic characteristics and BMI of parents who participated in the second aim of the study, MFPI and and dietary outcomes

Variable	Frequency (N)	%
Parents Race		
White	287	75.3
African American	54	14.2
Hispanic	23	6.0
Asian	15	3.9
Parents Income		
< $15,000	5	1.3
$15,000- $35,000	35	9.3
$35,000-$55,000	99	26.0
$55,000-$75,000	114	29.9
$75,000-$95,000	52	13.6
.> $95,000.	2	< 1
Parents Gender		
Female	194	50.9
Male	185	48.6
Parents education		
Some high school	2	< 1
High school graduates or equivalent	18	4.5
Some college	38	10.0

College graduates	222	58.3
Master's degree	92	24.1
Doctorate degree	3	< 1
BMI		
Underweight	12	3.4
Normal weight	156	44.3
Overweight	125	35.5
Obese	59	16.7

Frequency of Meals from Restaurants and Fast Food Establishments

The second aim of this study was to explore the relationship between the components of the MFPI and young children's (4-8 years old) dietary outcomes (intake of vegetables and fruits, whole grains, added sugar, and added sugar from sweetened drinks, meals from sit down restaurants and fast food establishments). It was hypothesized that mindful food parenting would be positively associated with desirable dietary outcomes in children such as increased intake of whole grain, vegetables and fruits. In addition, it was hypothesized that there would be an inverse relationship between the MFPI and intake of added sugar, added sugar from sweetened beverages, restaurant meals and fast food. Refer to table 4 for a description of food groups.

Table 4: Description food groups in dietary screener questionnaire.[95]

Food Group	Description
Added sugars	Soda containing sugar Sweetened fruit drinks Chocolate or any other type of candy Doughnuts or any type of sweet bread Cookies, cakes, pies or brownies Frozen desserts
Added sugars from sugar sweetened beverages	Soda containing sugar sweetened fruit drinks
Brown rice	Brown rice or other cooked whole grains, such as bulgur, cracked wheat, or millet
Beans	Refried beans, baked beans, beans in soup, pork and beans or any other type of cooked dried beans
Cheese	All kinds of cheese (including cheese as a snack, cheese on burgers, sandwiches, and cheese in foods such as lasagna, quesadillas, or casseroles. Not including cheese on pizza
Chocolates or any other type of candy	Not including sugar free
Cookies, cake, pie or brownies	Cookies, cake, pie or brownies
Dairy	Milk, cheese and ice cream
Doughnuts or pastries	Doughnuts, sweet rolls, danish, muffins, pan dulce, or pop tarts
Fast food restaurants	Dine in, carry out and delivery (such as McDonald's, Pizza Hut, KFC, Taco Bell, Wendy's)
Fried potatoes	French fries, home fries, or hash browns
Frozen desserts	Ice cream or other frozen desserts
Fruit	Fresh, frozen or canned fruit

Fruit juice	100% pure fruit juices (such as orange, mango, apple, grape and pineapple)
Fruits and vegetables	Fresh, frozen or canned fruit Leafy green or lettuce salad Other vegetables
Hot or cold cereals	Hot or cold cereals
Leafy green or lettuce salad	Leafy green or lettuce salad (with or without other vegetables)
Milk	Regular milk, chocolate or other flavored milks, lactose-free milk, buttermilk
Potatoes	Any other kind of potatoes (such as baked, boiled, mashed, sweet, or potato salad
Milk alternative	Soy milk or milk alternative (such as almond, cashew, oats, or others)
Other vegetables	Other vegetables (not including green salads, potatoes, cooked dried beans)
Pizza	Frozen pizza, fast food pizza, and homemade pizza
Processed meat	Processed meats are those preserved by smoking, curing, or salting, or by the addition of preservatives. Includes bacon, lunch meats, and hot dogs.
Restaurant meals with waiter or waitress services	Dine in, carry out and delivery
Red meat	Beef, pork, ham, or sausage, veal, lamb, and any lunch meat made with these meats
Regular soda or pop containing sugar	Regular soda or pop containing sugar (not including sugar-free sodas)
Sweetened fruit drinks	Sweetened fruit drinks, sports or energy drinks (Kool-Aid, lemonade, Hi-C, cranberry drink,

	Gatorade, Red Bull or Vitamin Water, homemade fruit juices with added sugar)
Tomato sauce	Tomato sauces (such as with spaghetti or noodles or mixed into foods such as lasagna)
Vegetables	Leafy green or lettuce salad Other vegetables
Whole grain bread	Whole wheat, rye, oatmeal and pumpernickel bread.

Correlations

As expected, there was a negative correlation between the MFPI score and regular soda or pop containing sugar, fruit juice, sweetened fruit drinks, fried potatoes, processed meats, pizza; tomato sauce; doughnuts or pastries, and cookies, cakes, pies or brownies. Furthermore there was a negative correlation between MFPI and restaurant meals with waiter or waitress services and fast food restaurants.

When grouped together, there was a significant negative correlation between MFPI total score and added sugars as well as added sugars from added sugar sweetened beverages. There was also a positive correlation between MFPI total score and vegetables (salads and other vegetables). Table 5 shows the correlations between MFPI total scores and dietary outcomes.

Table 5: Correlation between mindful food parenting score and dietary outcomes

Food Group	r	p
Regular soda or pop containing sugar	-.227	.000
Fruit juice	-.111	.030
Sweetened fruit drinks	-.204	.000

Milk	.132	.010
Fruit	.131	.010
Salad	.105	.040
Fried potatoes	-.194	.000
Vegetables	.116	.023
Pizza	-.193	.000
Processed meat	-.146	.004
Chocolates or any other type of candy	-.1081	.035
Doughnuts or any other sweet bread	-.190	.000
Cookies, pies or brownies	-.169	.001
Restaurant meals with waiter or waitress services	-.261	.000
Fast food restaurants	-.280	.000
Added sugars[a]	-.255	.000
Added sugars from sugar sweetened beverages [b]	-.235	.000

a Added sugars include soda containing sugar, sweetened fruit drinks, chocolate or any other type of candy, doughnuts or any type of sweet bread, cookies, cakes, pies or brownies, frozen desserts

b Added sugars from sugar sweetened beverages included: Soda containing sugar and sweetened fruit drinks

A one-way ANOVA was conducted to compare dietary outcomes by tertiles of MFPI score. Data were considered statistically significant at $p < 0.05$. Results show significant effects in several food groups (Table 6).

Table 6: Comparison of tertiles of total mindful food parenting and dietary outcomes

Dietary Variable	Tertiles of MFPI[a]			p[b]
	High ≥ 54 Mean ± SE	Medium (48-53) Mean ± SE	Low (< 48) Mean ± SE	

Added sugars[c] (weekly tps equivalents)	12.11 ± (.14.04)	20.34 ± (23.45)	18.36 ± (17.12)	.002
Added sugars from sweetened beverages[d] (weekly tps equivalents)	3.66 ± (5.54)	7.15 ± (9.35)	6.20 ± (6.90)	.001
Fruits and vegetables[e] (weekly cup equivalents)	17.12 ± (.83)	17.90 ± (.08)	15.90 ± (.79)	.476
Dairy[f] (weekly cup equivalents)	10.24 ± (10.50)	13.10 ± (14.73)	11.10 ± (12.35)	.152
Regular soda or pop containing sugar (weekly cup equivalents)	1.37 ± (2.26)	3.43 ± (5.36)	3.01 ± (2.26)	.000
Sweetened drinks[g] (weekly tsp equivalents)	2.28 ± (4.38)	3.72 ± (5.68)	3.18 ± (3.81)	.055
Leafy green or lettuce salad[h] (weekly cup equivalents)	4.35 ± (3.90)	3.47 ± (3.81)5.01 ± (4.36)		.007
Fried potatoes[i] (weekly cup equivalents)	2.15 ± (2.62)	3.53 ± (2.97)	3.32 ± (2.96)	.002
Pizza (weekly equivalents)	1.67 ± (2.42)	2.55 ± (3.04)	2.88 ± (3.20)	.004
Processed meats (weekly equivalents)	1.88 ± (2.13)	2.97 ± (3.22)	2.95 ± (2.93)	.034
Cookies, cakes, pies or brownies (weekly equivalents)	2.44 ± (2.98)	3.44 ± (3.69)	3.53 ± (3.52)	.023

a All values are shown as mean ± standard error

b P-value for the overall ANOVA test

c Added sugars include soda containing sugar, sweetened fruit drinks, chocolate or any other type of candy, doughnuts or any type of sweet bread, cookies, cakes, pies or brownies, frozen desserts

d Added sugars from sugar sweetened beverages included soda containing sugar and sweetened fruit drinks

e Fruits and vegetables included fresh, frozen or canned fruits; leafy green or lettuce salad and other vegetables

f Dairy included milk, cheese and ice cream

g Sweetened beverages included sweetened fruit drinks, sports or energy drinks (Kool-Aid, lemonade, Hi-C, cranberry drink, Gatorade, Red Bull or Vitamin Water, homemade fruit juices with added sugar)

h Leafy green or lettuce salad and other vegetables

i French fries, home fries, or hash browns

Chapter VI: Discussion

The primary aim of the current study was to develop a measurement tool of mindful food parenting for parents of small children, ranging in age from 4 to 8-years-old. The instrument developed for this study drew from a previously developed mindful food parenting questionnaire (MFPQ)[17] and a mindful parenting model by Duncan, Coatswork and Greenberg.[23] However, the overall structure more closely resembled the mindfulness-based awareness training for binge eating disorder (MB-EAT).[60] In previous literature, beyond the well-known applications in adults, MB-EAT has been used to develop a curriculum to teach mindful eating to third to fifth graders.[65] The elements drawn from the mindful parenting model by Duncan, Coatswork and Greenberg[23] were eliminated during the validation process.

In contrast with the MFPQ,[17] the instrument developed for the current study sought to measure mindful food parenting in a manner that would relate to parental actions aimed to create an internal and external environment conducive to mindful eating in small children. One commonality between the MFPQ and the MFPI is the strength of one of their subcomponents or subscales: the present centered awareness. While the MFPQ consists of a four-factor model,[17] only the present centered awareness subscale has been used in subsequent studies due to strong psychometric properties.[18,19] This subscale include 4 items: “I tend to feed my child while I am doing other things” (reverse coded), “When I am feeding my child, I am often distracted by other thoughts” (reverse coded), “When I am feeding my child, I am completely focused on what I am doing,” and “I rush through meals without really paying attention to them” (reverse coded). Similar to findings by Meers et al,[17] this study also found that the present centered awareness

subscale was one of the strongest of the instrument. However, it should be noted that in comparison with the MFPQ, the MPFI present centered awareness subscale only consisted of two questions. The questions were "My child eats meals while I am doing other things (such as cleaning or making a phone call)" (reverse coded) and "while my child eats meals, I am often distracted by other thoughts (such as things to do, finances and others)" (reverse coded). Other questions were eliminated during the validation process. The strength of the center present awareness subscale in both studies is consistent with the core of mindful parenting: to be present in the interaction between parent and child.[23]

The MFPI was validated using a series of steps. In the first step, registered dietitians with expertise in mindful eating and parents reviewed the tool to ensure that the questions were clear, easy to understand and relevant. After the review, two questions were eliminated leading to the removal of one component. In the next step, content validity and reliability were tested and one more component eliminated. The final version of the MFPI consisted of three components. The first component of the MFPI, bringing mindful attention and awareness to the eating experience, provides elements necessary to cultivate an external and internal environment that allows mindful food parenting. The content reliability of this component was the strongest of the instrument, with Cronbach's alpha of 0.766 compared to 0.733 for the other components. Once parents create routines to help children transition to mealtime, sit for meals as a family, remove electronic stimuli, and are mentally present, they can focus their attention on their children's eating behaviors.

The next component that can help explain the positive correlation between total mindful food parenting scores and positive dietary outcomes is cultivating awareness of parent and child emotions and reactivity to emotions. Parental emotions, such as depression or stress can trigger automatic or inadequate feeding practices. For example, maternal stress has been reported to decrease proactive parenting practices to reduce obesity or prevent weight gain. Proactive parenting to prevent obesity or weight gain includes meal preparation or transportation to organized sports.[12] In addition, parental stress and depression have been associated with increased odds of parents engaging in pressure-feeding and has been reported to negatively impact the proportion of home-made meals served.[12] Thus, it is possible that when parents mindfully feed their children, they engage in feeding practices that promote positive dietary outcomes in children.

The last component of the instrument focuses on the responsiveness of the parent regarding hunger and satiety cues of the child. This component aligns with the mindful eating principle that encourages eating in response to hunger and satiety.[71] While this component was not directly correlated with positive dietary outcomes in this study, the Cronbach's alpha was within an acceptable level ($\alpha = 0.733$). Moreover, awareness of the hunger and fullness experience of the child has been considered an important element to prevent childhood obesity by the Institute of Medicine Early Childhood Obesity Prevention Policies.[46] This parental practice encourages the child to eat independently and in response to hunger and satiety cues. Responsive feeding may also encourage self-regulation in eating and support cognitive, emotional, and social development in young children.[95] Furthermore, it might decrease parental

feeding practices that lessen a child's ability to learn self-regulation skills such as controlling eating behavior.

This study also sought to determine whether the MFPI was correlated with dietary outcomes in children. We found that mindful food parenting was negatively correlated with intake of sweetened beverages (regular soda or pop containing sugar; sweetened fruit beverages, sports or energy drinks); added sugar intake (soda containing sugar; sweetened fruit drinks and sports energy drinks); chocolate or any other type of candy; doughnuts, sweet rolls, danish, muffins, pan dulce, or pop tarts; cookies, pies or brownies; and ice cream or other frozen desserts) and meals away from home (restaurants with or without waiter service and fast food establishments). These findings support the proposed hypothesis.

The pioneer study about mindful food parenting by Meers et al[17] found a negative correlation between mindful food parenting and children's soda consumption, salty snacks and fast food. In addition they found a positive relationship between fruits and vegetables and mindful food parenting. Another study by Emley et al[18] found that mindful feeding was positively correlated with child fruit and vegetable (not including fried potatoes) and whole grain intake. Mindful food parenting was negatively correlated with added sugar and sugar-sweetened beverage intake in children. Thus, the findings of the current study, in congruence with available literature, suggest that mindful food parenting is correlated with positive dietary outcomes.

Conclusion

The Mindful Food Parenting Instrument is a useful tool to measure mindful food parenting. Furthermore, the MFPI has the potential to measure mindful food parenting interventions. In addition, the findings presented correlating MFPI total score and dietary outcomes, provide convincing evidence that mindful food parenting is a theory worthy of further research. While the associations between mindful food parenting and positive dietary outcomes were modest, it is consistent with previous research.

Limitations

Due to the nature of the data collection method, the population in this study was technologically-adept, highly educated, mostly white and were in the higher socioeconomic status. This is consistent with the literature regarding MTurk users.[97] Hispanics, blacks and Asians were underrepresented in this study. It is uncertain if the tool is appropriate for these groups and groups that are less educated or in a lower socioeconomic status. Furthermore, MTurk workers are diligent as the structure of the platform rewards them for their work quality. While the desire to provide quality reponses is beneficial, MTurk workers also score high in social desirability and it appears that they seek to please requesters.[97]

In addition, this study only surveyed parents of children between ages 4 to 8 years old, thus the results are not generalizable to older children. The age range was chosen so that dietary outcomes could be compared to existing research, and also because parents of children in this age group still have a large influence on their children's food availability and timing of meals.

Beyond the limitations already described, the second part of the study used a dietary screener to collect the dietary outcomes data. The screener has been shown useful for rough estimates of dietary intake. However, the retrospective nature can introduce recall bias, leading to an inaccurate estimation of dietary intake. Moreover, the questionnaire does not offer a reliable portion size measurement. Thus, screeners are considered a semi quantitative assessment method and not intended to assess actual intake but rather to rank subjects according to their typical intake.[96] Another limitation of this study is that information was obtained by parents self reported data with possible self-report bias or errors in recall. Underreporting food has been found to be common regardless of the questionnaire used.[97] It is also important to mention that bias of social desirability affects reporting. Individuals are influenced by social norms and values when reporting their dietary intake. Furthermore, the cross-sectional nature prevents a cause and effect relationship.

Implications to Practice

Registered dietitians could use this newly developed instrument (MFPI) to measure mindful food parenting before and after interventions in a variety of settings. In addition, the theoretical framework can be used as a foundation to create an intervention. While this study participants were parents, the MFPI could potentially be used in other groups of caregivers. For example, it could be used to measure mindfulness among caregivers in preschool settings.

Recommendations for Future Research

Future research in mindful food parenting has great potential of improving children's diet by providing parents and caregivers a clear guide about how to provide an environment conducive to healthier eating. In future studies, the MFPI could be tested using a more accurate measurement of dietary outcomes such as a 24 dietary recall. The instrument could also be used to measure mindfulness of other caregivers that guide mealtimes for children such as teachers in early education centers, other family or paid caregivers of children.

The MFPI could also be used as a base for the development of mindful food parenting interventions.

Appendix A

The Mindful Food Parenting Instrument (MFPI)

The instrument will be measured on the scale of always, often, sometimes, rarely and never.

Component 1: Bringing mindful awareness to eating experiences

Subcomponent 1: Cultivating an external environment that leads to mindful food parenting

1. Before sitting at the table, I help transition my child to meal time by performing routines (such as cooking, washing hands or setting the table).
2. My child watches TV while he/she eats meals (breakfast, lunch or dinner). Reverse coding.
3. I use my phone or tablet while my child is eating meals (breakfast, lunch or dinner). Reverse coding.
4. We often sit as a family during meals.

Subcomponent 2: Parental present moment awareness

5. My child eats meals while I am doing other things (such as cleaning or making a phone call). Reverse coded.
6. While my child eats meals, I am often distracted by other thoughts (such as things to do, finances and others). Reverse coded.

Component 2: Creating awareness of the hunger and fullness experience

7. I recognize when my child is hungry.
8. I recognize when my child is full (satisfied).
9. I help my child identify and tell me when he/she is hungry.
10. I help my child identify and tell me when he/she is full (satisfied).

Component 3: C

11. I am aware of how my emotions (anger, sadness, happiness) influence when and what food I serve to my child.
12. I am aware of how my child's emotions influence when and what food I serve to my child.
13. I am aware of how stress impacts on how I interact with my child during meals.
14. When I am stressing about how my child is eating, I think about it before I take action.

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