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ASSOCIATIONS BETWEEN CHILD WEIGHT STATUS AND THE HOME
ENVIRONMENT: AN ANALYSIS OF PARENTAL EATING POLICIES

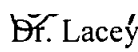
BY
EMILY SMITH

A thesis submitted in partial fulfillment of the requirements for the
Master of Nutrition & Exercise Sciences
Specialization in Nutrition Sciences
South Dakota State University
2017

ASSOCIATIONS BETWEEN CHILD WEIGHT STATUS AND THE HOME
ENVIRONMENT: AN ANALYSIS OF PARENTAL EATING POLICIES

EMILY SMITH


This thesis is approved as a creditable and independent investigation by a candidate for the Master of Nutrition and Exercise Sciences with a Specialization in Nutrition Sciences degree and is acceptable for meeting the thesis requirements for this degree. Acceptance of this does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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I dedicate this thesis to my loving parents, Todd and Patricia Smith.

Thank you for supporting me and believing in me throughout my entire college career.

You both have also taught me the importance of determination, which I will always rely on to help me succeed in all that I do. I love you both so much!

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ABBREVIATIONS

BMI Body Mass Index

CHES Caregiver Comprehensive Home Environment Survey

U.S. United States

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ABSTRACT

ASSOCIATIONS BETWEEN CHILD WEIGHT STATUS AND THE HOME
ENVIRONMENT: AN ANALYSIS OF PARENTAL EATING POLICIES

EMILY SMITH

2017

Background: Childhood obesity is a complex issue common in the U.S. today as it not only is associated with health-threatening comorbidities, but also increases a child's likelihood of becoming overweight or obese during adulthood. Because of its complexity, several factors, including parents and the home environment, must be considered when assessing child weight status and also when aiming to prevent or treat childhood obesity.

Objective: To investigate specific food rules practiced within the home environment that are influencing child weight status and to identify if these rules contrast among children who are normal weight and those who are overweight/obese.

Methods: A cross-sectional sample of home environment data determined by the parents of preschool-aged children (ages 3 to 5) was taken from the larger iGrow Readers dataset to determine if certain food rules were associated with child weight status. Children of any weight status were invited to participate and parents had varying weight statuses, relationship statuses, ethnicities, occupations, education levels, and relationship statuses.

Results: Findings indicate that only a couple of food rules currently being practiced within the home environment are associated with increased chances of child overweight/obesity. However, no other rules were found to be associated with weight status.

Conclusion: The extent to which the home environment impacts child weight status is still unclear. Several aspects of the home environment need to be examined altogether rather than separately when examining child-related outcomes.

CHAPTER 1

REVIEW OF LITERATURE

Introduction

A review of literature was completed to further understand how the home environment, including parental influences, impacts child weight status. This review addressed several topics, which included the prevalence of obesity, impact of various types of childhood obesity interventions, parental influences and modeling, and effects of the home environment on child weight status.

Obesity

Being overweight or obese is best characterized as being of a weight that is higher than what is considered healthy for a given height. While an imbalance of energy intake and expenditure may serve as the main cause of overweight and obesity, there are many other factors that contribute to its complexity and development. Some of these factors include genetics, environment, stress, sleep, diet, and physical activity.¹

Since weight status can be affected by many different factors, it is of no surprise that overweight and obesity are both so prevalent today. According to Ogden and colleagues, the prevalence of obesity and extreme obesity among children and adolescents in the U.S. between 2011 to 2014 was 17% and 5.8%, respectively.² In addition, 21-24% of children and adolescents are overweight.¹ Childhood obesity is a serious epidemic that requires attention because obese children are likely to have one or more obesity-related comorbidities, such as abnormally high blood pressure, dyslipidemia, fatty liver disease, pre-diabetes, diabetes, sleep apnea, and psychosocial problems.³⁻⁵ Further, obesity during childhood can increase an individual's risk of

becoming obese during adulthood. Therefore, prevention of obesity among children is crucial.⁵

The categorization of weight status of children between the ages of 2 and 19 years is based on individual growth and development and is determined by calculating Body Mass Index ⁶ and plotting it on age- and sex-specific BMI reference charts.⁷ Additionally, the four BMI Percentiles are typically utilized to classify the weight status of children of this age group (see Table 1). While weight loss is recommended for adults, weight management strategies for children focus on maintenance of a healthy weight curve and prevention of excessive weight gain while continuing to grow and develop normally.^{8,9}

However, because obesity is a complex disease, it is also important that public health researchers and other health professionals understand the factors that can contribute in different ways and on several levels. The Social Ecological Model clearly explains these factors and their associations.

Social Ecological Model

The Social Ecological Model (SEM) has commonly been used in public health research to explain and identify the etiology and complexity of childhood obesity. The SEM consists of the following five levels: intrapersonal (or individual), interpersonal, institutions, community, and public policy (see Figure 1).¹⁰ The intrapersonal level is comprised of an individual's attributes such as attitudes, behavior, and knowledge while the interpersonal level consists of social support systems such as family and friendship networks.¹⁰ The institutional level is made up of social institutions such as school and work environments while the community

level is made up of the interconnections and relationships between certain organizations, formal networking systems, and institutions found within a certain area, or community.¹⁰ Finally, the public policy level consists of laws and policies found at local, state, and national levels.¹⁰ Past research studies have examined only specific levels of the SEM rather than the collective effects that all levels can contribute to desirable changes in child weight status.¹¹ In other words, all levels of SEM should be utilized in interventions in order to ensure that child weight status is being influenced in more than one way or on more than one level as each level builds onto the next.

For example, the intrapersonal level could impact child obesity through educating children about nutrition through the presentation of a curriculum that aims to build upon current nutrition knowledge and health behaviors. Also, the interpersonal level could impact child obesity through targeting and educating parents and families about proper nutrition and physical activity and how they can help their children adopt those behaviors at home and in overall life in order to reduce unhealthy behaviors and thus, improve their weight status. The institutional level could impact child obesity through the utilization of family or child-focused wellness programs or restructuring the environments of schools, daycares, or worksites to be more supportive of obesity preventive behaviors.

Additionally, the community level could impact child obesity through developing partnerships between organizations and institutions that can help raise awareness about childhood obesity and what can be done to prevent or treat it. Communities interested in impacting childhood obesity should also aim to be more supportive of

preventing or treating it through its built environment, which could mean providing a safe environment for children to be physically active or encouraging local supermarkets or food banks to provide information about purchasing and preparing fresh fruits and vegetables. The public policy level could impact childhood obesity through the development and implementation of policies that promote healthy behaviors to support childhood obesity such as putting a tax on processed foods or sugar sweetened beverages to encourage people to buy and consume healthier foods. Therefore, studies should include multiple components working at multiple levels in order to improve child weight status.

As evidenced by a community-based intervention in Australia conducted by de Silva-Sanigorski and colleagues, environmental or community approaches can help decrease childhood obesity prevalence.¹² In this intervention, the participating community was administered subtle health promotion materials that focused on environmental modifications to increase both active play and healthy eating in childcare educational locations. Additionally, the intervention included encouragement of the following components: daily physical activity, daily water and fewer sugary drinks, daily consumption of fruits and vegetables, and reduced screen time.¹² The main outcome measures of the intervention were BMI, obesity/overweight prevalence, and obesity associated behaviors among children ages 2-3.5 years old. When the intervention was complete, a recognizably lower average weight, BMI, and prevalence of obesity among the 2 and 3.5 year olds were all observed.

The intervention described above was successful because it included multiple components working at different levels to address more than one component of SEM. It is clear that this intervention implemented changes at the intrapersonal, community, and institutional levels as health behaviors and weight status of children were focused upon and solutions to improve them were implemented in both the community and institutional (childcare/school) settings.

School-Based Interventions

Schools have often served as a site for several obesity-focused interventions given that children spend the majority of their day in this setting.¹³ Diet and physical activity can be impacted by participation in the National School Breakfast and/or Lunch Programs and involvement in physical education, after-school programs, or school sports.^{13,14} However, schools can either support or hinder healthy behaviors. For example, schools can choose to provide nutrition and physical education or they can also make serving healthy meals in school cafeterias or attending physical education classes mandatory. Therefore, schools should pay close attention to the approaches that they take and the components they include when it comes to implementing obesity interventions.

According to several meta-analyses, successful school-based interventions incorporate multiple components working at multiple levels of SEM. A meta-analysis by Gonzalez-Suarez and colleagues indicated that successful interventions have utilized both physical activities and classroom nutrition education curricula and have also included various strategies such as incorporating parent involvement and changing the school environment through offering healthier foods in the schools’

cafeterias.¹⁵ A meta-analysis by Katz and colleagues reported similar findings about the inclusion of parental/family involvement and nutrition and physical activities in classrooms as well.¹⁶ However, Katz and colleagues also noted that the following strategies directed toward impacting weight status were also utilized: modifying the schools' physical environment, incorporating skill-strengthening activities, distributing printed educational materials, training teachers, teaching children about self-monitoring, and changing the frequency, length of time, or intensity of activities offered as part of physical education.¹⁶ Therefore, based on this evidence, it can be concluded that multiple components working at multiple levels delivered as part of an intervention can help decrease the prevalence of childhood overweight and obesity.

Finally, a review of reviews found that parental involvement was also an important factor in determining effectiveness.¹⁷ This review of reviews indicated that parent involvement was present in half of the reviewed school-based interventions.¹⁷ One of the included reviews indicated that 11 out of 22 parent-involving trials affected either obesity prevalence or BMI. Another of the included reviews indicated that 8 out of 16 parent-involving trials ended with behavior change.¹⁷ Yet another of the included reviews found that 34 out of 66 trials demonstrated a noticeable effect of parental participation.¹⁷ Further, two other meta-analyses reviewed indicated a similar trend in intervention effectiveness when parental involvement was included.^{16,18}

School-based interventions are important because they are impactful on more than one level of SEM. School-based interventions such as the ones described above include various components working at different levels of SEM to influence changes among students. School-based interventions work not only at the intrapersonal level

of SEM as they aim to improve the health behaviors and weight status of children through the deliverance of several nutrition and physical activity levels, but also they incorporate the interpersonal, institutional, organizational, community, and policy levels of SEM. For example, the interpersonal level is represented through the involvement of parents through take-home educational materials and training of teachers to provide nutrition and physical activity lessons. Additionally, the institutional, organizational, and community levels are represented, as the physical environments of schools were changed to support the obesity intervention goals. Further, the policy level is represented as well as physical education programs and school meals were modified as well to be more supportive and encouraging of healthy behaviors that aim to improve weight status among children.

Also, schools themselves have the capacity to impact school environments through the implementation of certain policies. For example, schools can allow different programs and associations such as the National School Lunch Program and physical education or activity programs to be supportive of the school's decision to become more connected and supportive of regular nutrition and physical activity practiced in schools. Schools also include different communities or age groups of students, their parents, and their teachers to work together to also be supportive of nutrition and physical activity changes implemented in schools. However, while child obesity interventions have been successful, child obesity interventions can be implemented in settings other than schools can be just as effective.

Childcare-Based Interventions

Childcare settings have also been used as sites for implementing child obesity interventions, and may be able to contribute more promising effects in terms of childhood obesity prevention.¹⁹ This is due to the fact that the majority of what a child learns about food and nutrition takes place during his or her first years in life.¹⁹

As in school-based interventions, childcare center based interventions have certain components that can help improve their effectiveness. First, according to a systematic review by Sisson and colleagues which reviewed articles about 71 obesity interventions, at least half of the studies showed that obesity was favorably affected through the implementation of various practices and policies that impacted both the childcare center environments and encouraged healthy eating and physical activity behaviors.²⁰ Overall, the results showed that obesity and related behaviors such as dietary behaviors, screen time, and physical activity, can be affected by health behavior interventions as most of the interventions reviewed were based on strategies that included one or all of these factors.²⁰ Most interventions aimed to focus on physical activity through child participation in lessons that included physical activities led by the teacher or instructor.²⁰ Overall, the majority of those interventions elicited a desirable effect on outcomes for physical activity. Also, 45 out of the 71 interventions reviewed included at least one dietary behavior in their list of outcome measurements.²⁰ Of those 45 interventions, 39 demonstrated a positive change in at least one nutritional outcome.²⁰ Also, two successful interventions reviewed included parental involvement and multi-level components.²⁰

Some of the interventions included environment changes that focused on play areas, practices, and policies. For example, some of the interventions that addressed

play areas renovated these areas or made them more accessible to children for them to use as a place to be physically active and practice motor skills and movement.^{21,22}

Other interventions aimed to promote certain practices and policies within their child care facility to be more influential and supportive of healthy eating, physical activity, and regular movement among children.²³ Additionally, some interventions focused on dietary behaviors by implementing changes to practices and policies of child care centers to be more supportive of healthy eating and physical activity practiced in childcare centers.²³⁻²⁵

Therefore, interventions that are both implemented in the childcare setting and consistent with recommendations for obesity prevention should include multiple components working at different levels. These interventions should also focus on nutrition and physical activity encouraging childcare center environments and policies and practices.²⁰ More interventions should include these aspects and build upon pre-existing materials and effectiveness based upon evidence.²⁰ They should also involve parents and staff in order to help maintain healthy changes for both children and their families over time.²⁰ With that said, parental influences play an important part not only in interventions, but also in child weight status.

Like school-based childhood obesity interventions, childcare center based obesity interventions are important because they also are impactful on more than one level of SEM. Childcare center based interventions such as the ones described above include nutrition, physical activity, and components that aim to improve the health behaviors and weight status of children and therefore, incorporate the intrapersonal level of SEM. Also, parents and instructors or care providers involved in childcare center

based interventions can also help encourage changes on the interpersonal level among children involved being supportive of an environment that encourages positive nutrition and physical activity behaviors by delivering interactive and educational activities in the childcare center. Further, childcare interventions impact the institutional, organizational, and community levels by having the capacity to include different groups or institutions by collectively allowing different programs associated with childcare centers to be supportive of the facility's decision to become more connected and supportive of nutrition and physical activity practiced there. Finally, childcare interventions have the potential capacity to modify policies and practices such as times for physical activity to occur or certain snacks served to be more supportive of proper nutrition and physical activity in the childcare center environment as well.

Several obesity interventions have been implemented in both school and childcare center settings because children spend a lot of time there. Therefore, much is known about their abilities to impact child weight status and related health behaviors. However, children also spend quite a bit of time at home. Unfortunately, few studies have been conducted in the home environment, and therefore, not as much is known. So, in order to fully understand children's health behaviors, and the impact they have on their weight status and overall health, parental influences and modeling within the home environment need to be investigated further.

Parental Influences & Modeling

There is much evidence from current research that supports the idea that parents play an important part in developing not only their children's health behaviors, but

also their health outcomes.²⁶ Parental influences and role modeling can impact child weight status because both are examples of affecting child weight status on the interpersonal level rather than just on the intrapersonal level. In fact, recent research reviews have indicated that parenting style, rules, and modeling are directly related to children's diet and weight status.²⁶ Also, parent modeling especially can be effective in improving child dietary habits and weight status as it gives parents a chance to set an example for their children to live by and encourage them learn healthier living practices so that their weight status can be managed and/or improved effectively.

Faught and colleagues investigated the relationship between parental attitudes toward healthy eating and child dietary quality and weight status.²⁶ This study required 5th grade students ages 10-11 to fill out a food frequency questionnaire (FFQ) and a student survey as well as have their height and weight measured to be used to calculate BMI.²⁶ Also, the parents of the students were required to fill out a survey about their home, which included questions about their beliefs and support toward healthy eating as well as if they encourage their children to consume healthy foods.²⁶ The surveys that the students filled out asked about what they eat on a regular basis in order to assess their diet quality and meeting of recommendations for consumption of fruits and vegetables.²⁶ The results of the study indicated that both increased encouragement and caring about health eating among parents were related to an increased chance of their children meeting recommendations for fruits and vegetables.²⁶ Also, research from this study showed that the highest reported caring and encouragement behaviors among parents benefit children the most.²⁶ Thus, it can be interpreted from this study that health promotion practices that influence parents to

consistently and successfully promote and show interest in healthy eating may help reach both improvement of dietary outcomes among children and reduction of childhood obesity prevalence.²⁶

Another review of several studies was conducted by Gerards and colleagues in 2015 to give an update on existing evidence about the association between child weight outcomes and parental influences.²⁷ One of the key findings of this review was that for 11 studies, parental knowledge about role modeling and nutrition were two of the most commonly used intervention factors.²⁷ Further, educating parents about encouraging healthy lifestyle behaviors and nutrition were found to end in improved child BMI, improved parent and child health behaviors, and improved parental knowledge in these topic areas.²⁷ Also, another systematic review performed by the same authors in 2011 compared seven intervention studies that utilized general parenting as a focal point to prevent childhood obesity. All of these studies had positive effects on a minimum of one outcome measure associated with child weight.

Other research suggests that parenting style and rules practiced at home can also impact child weight status.²⁸ A review of 66 articles was conducted by Ventura and Birch to assess the evidence that supports the idea that parenting can affect children's eating and create a series of strategies that focus on certain factors of parenting, which could potentially aid in child obesity prevention. The studies reviewed mainly focused on the relationship between parenting and child eating behaviors. Also according to Ventura and Birch, some cross-sectional studies have indicated that those children with indulgent parents have higher BMI Z-scores than those children with authoritative parents.^{28,29} Also indicated in this review was the idea that

authoritative parenting styles were associated with increased availability of fruits and vegetables at home.^{28,29}

According to this review, Ventura and Birch were the first to put together and summarize research about the relationship between parenting and child diet and weight status.^{27,28} In fact, the association between parenting and child diet and weight status was uncovered in two out of the four studies that Ventura and Birch reviewed.²⁷ It was also concluded in a review by Gerard and colleagues that it is crucial to understand that parenting is both reactive to and influenced by child characteristics.²⁷ Another important component of parent influences and modeling to consider is the establishment of home food rules by parents.³⁰

Home food rules can also impact weight status. A cohort study was done to investigate the associations between the home food environment (HFE) and weight status among children and their families and one of the main variables measured was the establishment of food rules.³¹ The results of the study indicated that child weight status was associated with many different components of parenting related to child eating practices.³¹ BMI z-score of children was negatively related to pressure to eat from parents as well as parent utilization of food restriction.³¹ Additionally, occurrences of child overweight were lower when parental pressure to eat was higher and were higher when parents practiced food restriction and permissive feeding.³¹ The home food environment as a whole plays a very important role in weight status among children.³¹ More specifically, parenting practices including home food rules have been favorably related to child weight status.³¹

Further, parents have the power to change their home environment to support certain food rules by controlling what foods are available for their children to eat. If children only have access to certain foods in their home, they will only be able to eat those foods as they are unable to eat foods that are unavailable to them.³² Availability actually moderates children's food consumption in the way that homes with access to fresh fruits and vegetables are more likely to influence or motivate child consumption of fruits and vegetables.^{32,33} In other words, if healthy foods are more available than unhealthy foods to children in their homes, they will more likely eat healthy foods, which can help reduce their risk of gaining weight and becoming overweight or obese.

CHAPTER 2

INTRODUCTION

Childhood obesity is a common problem in the U.S. and since it associated with early development of adverse health conditions and increased risk for overweight and obesity during adulthood, its prevention is crucial. Research exists to support the idea that child weight status can be directly impacted by certain factors of the home environment. However, what is unknown is to what extent the home environment does so.

Several childhood obesity prevention measures have been taken in different environments, including schools and childcare centers, and while some studies have focused on the home environment specifically, not enough is known about the extent to which specific factors of the home environment, such as food rules, can impact child weight status. Therefore, the purpose of the present study was to investigate specific food rules within the home environment that are impacting child weight status and to determine if those rules differ among children of different weight statuses (normal vs. overweight/obese). Overall, the present study aims to provide more information about which food rules have more of an impact on child weight status and if home practices regarding parents and food need to be modified in order to be more supportive of healthy child weight outcomes.

CHAPTER 3
MANUSCRIPT

Abstract

Background: Child weight status can be affected by several factors, including certain aspects of the home environment. The home environment has a complexity of its own, which needs to be further investigated in order to fully understand the impact that it has on child weight status.

Objective: The purpose of this study was to investigate specific food rules within the home environment that are impacting child weight status and to determine if those rules differ among children who are normal weight and those who are overweight/obese.

Design: The present study is based upon a cross-sectional data analysis from the larger iGrow Readers study dataset, specifically from the follow-up visit. Children ages 3 to 5 (n=219) and their parents (n=172) from child daycare centers and preschool facilities in the Midwest were included. Children and parents could be of any weight status. Parents also had varying relationship statuses, ethnicities, occupations, education levels, and household incomes.

Statistical Analysis: T-tests, chi-squared tests, and logistic regressions were utilized to assess parent and child demographic variables, score for the Parental Policies to Support Healthy Eating section of CHES overall, and scores for individual questions. T-tests identified and compared parent age and BMI while chi-squared tests identified and compared parent gender role, parent education and income levels, and child age and gender. Logistic regressions were used to assess if child weight status was impacted by overall parent rule score and if child weight status differed by individual questions.

Results: Parent education level, child gender, and parent BMI differed significantly ($p=0.025$; $p=0.003$; $p=0.050$) between overweight/obese and normal weight children.

Overall score for the Parental Policies to Support Healthy Eating section of CHES did not differ significantly between the two weight status groups ($p=0.916$); however, some individual question scores did (Table 3).

Conclusions: The findings of the study suggest that some food rules are more impactful than others in terms of how they affect child weight status. While it is unclear the extent to which the home environment impacts child weight status, multiple aspects of the home environment must be investigated together when examining child-related outcomes.

Introduction

Weight status is complex and can be affected by many different factors and the prevalence of overweight/obesity has plateaued only in recent years. According to Ogden and colleagues, the prevalence of obesity and extreme obesity among children and adolescents in the U.S. is 17% and 5.8%, respectively.¹ Additionally, 21-24% of children and adolescents are overweight.² Obese children are likely to have one or more obesity-related comorbidities, such as abnormally high blood pressure, dyslipidemia, fatty liver disease, pre-diabetes, diabetes, sleep apnea, and psychosocial problems BMI based on height and weight.³⁻⁵ Further, obesity during childhood can increase an individual's risk of becoming obese during adulthood. Therefore, prevention of overweight/obesity among children is crucial.⁵

Like weight status, the home environment is complex, as it has several components and can be impacted in different ways. The home environment can play an important role in shaping dietary behaviors that impact weight status as 68% of calories originate from home food sources and people spend a great deal of time at home.³⁴ In fact, among young children especially, the home environment (and their parents) can be crucial in determining child weight status as several studies have indicated positive effects in terms of intervention on at least one child weight outcome measure.^{27,35-40} Additionally, associations between childhood obesity and the home environment have been explored. For example, some studies have specifically examined parent role modeling and policies within the home environment as well as availability and accessibility of certain foods within the home.^{41,42} Other studies have investigated additional factors including food rules and related parent behaviors. While these studies

have offered informative results, few have investigated more than one or a couple of factors at a time within the home environment and the effects those factors have on both physical activity and diet outcomes.⁴¹

Food rules

A study investigating the associations between the home food environment and weight status among children and their families measured the establishment of food rules “allowing/limiting” certain foods and food-related behaviors within the home.³¹

Researchers found that child weight status was associated with not only food rules, but also with other components of parenting related to child eating practices including feeding practices, frequency of dining out, parental view of costs associated with food, and home food availability.³¹ Also, according to a qualitative study by Holsten and colleagues that was done to determine how children make food choices within the home environment, parents construct food options through the purchase and preparation of foods and indirectly impact child food choices by modeling behaviors, supplying information, and establishing rules.⁴³ In fact, establishing food rules within the home have been associated with improved quality of diet among youth.³¹

A systematic review investigated the impact of home environment factors on child fruit and vegetable consumption.⁴⁴ In this review, family rules (allow/demand) were positively related to child fruit and vegetable consumption and, therefore, improved diet quality.⁴⁴ However, while the establishment of food rules was associated with positive effects in this study, other studies have found the contrary. Birch and colleagues investigated if restrictive feeding practices encouraged eating in the absence of hunger (EAH) among girls and if the weight status of girls mediated the effects that restrictive

feeding practices have on overeating, and therefore, on weight status.⁴⁵ The study design included the following measures: maternal diet restriction (high and low), weight status factors (overweight and not overweight), and three age groups (ages 5, 7, and 9).⁴⁵ The results of the study indicated maternal restriction can encourage overeating and that overweight girls at the age of 5 may be genetically subject to being extremely receptive to cues within her environment.⁴⁵ Therefore, food rules can be either positive or negative in terms of influencing child behaviors that may impact their eating habits and ultimately, weight status. Another important factor of the home environment that has been studied includes parent behaviors, many of which are similar to food rules described above.⁴¹

Parent behaviors

Wang and colleagues investigated the relationship between multiple home environment factors including parent behaviors and food availability and body weight and dietary intake among overweight/obese children in southern Appalachia.⁴² The specific parenting behaviors investigated included parents monitoring child eating, modeling and parental control of child diets, and parental restriction and pressure in feeding.⁴² Findings showed that the home food environment, including parenting behaviors and food availability, is associated with the dietary intakes and weight statuses of overweight/obese children.⁴² Higher levels of parental restriction and pressure in feeding were correlated with increased fruit and vegetable intake among children and that parental monitoring of child eating was correlated with a decreased risk for consuming fat.⁴² Additionally, parental restriction and pressure in feeding, parental feeding responsibility, and parental monitoring were all correlated with improved weight status and behaviors.⁴² However, poor parent modeling was correlated with eating behaviors

that are more negative.⁴² In support of this finding, another research study by Ostbye and colleagues determined that positive parent role modeling may be just as crucial for preventing childhood obesity and than it is for their feeding practices.⁴¹

Further, Couch and colleagues determined indulgent parenting practices related to child eating as well as parent food restriction were unfavorably associated with child BMI z-score while parent modeling, verbal reassurance, and pressure to eat were favorably associated with child BMI z-score.³¹ In other words, BMI z-score was higher with parent utilization of food restriction and pressure and BMI z-scores were lower with parent modeling, verbal reassurance, and pressure to eat.³¹ With these findings in mind, it can be determined that parent behaviors as part of the home environment can also impact child weight status. However, yet another home environment that plays an important role in child weight status and associated eating behaviors is food availability.

Food availability

Parents have the power to change their home environment to support certain food rules by controlling what foods are available for their children to eat. In fact, parents are considered gatekeepers at home in that their children are only able to eat those foods within their home that are provided to them by their parents.³² In other words, if healthy foods are more available than unhealthy foods to children in their homes, they will more likely eat those healthy foods, which can help reduce their risk of gaining weight and becoming overweight or obese. This statement is supported by evidence from Arcan and colleagues who investigated the associations between BMI of young American-Indian children and home environment factors including food availability, physical activity, and dietary intake.⁶ Results from this cross-sectional study indicated that children who are

part of families that have higher availability of vegetables and healthy food also consume vegetables more frequently, and therefore, have increased chances of being a normal weight and decreased chances of being overweight or obese.⁶ In other words, both higher vegetable availability and consumption are associated with lower child BMI.⁶

Wang and colleagues also investigated food availability as a factor of the home environment that could influence both child weight status and diet.⁴² The authors concluded that the availability of foods within the home, unhealthy foods especially, was highly associated with child consumption of unhealthy foods as the consumption of these foods was likely encouraged by their availability within homes.⁴² The authors also concluded that the availability of sweets and chips specifically within a child's home in addition to improper parent modeling of eating was associated with higher risk of child consumption of fats and sweets.⁴² Therefore, the availability of food within the home environment as controlled by parents directly impacts which foods children have access to and can consume within their own homes.

Research indicates that factors within the home environment, including parent behaviors/rules and food availability can impact child diet and ultimately, child weight status as well. Investigating internal home environment factors related to both child overweight and obesity is crucial to understanding the etiology of both conditions and in creating interventions to help prevent childhood obesity.⁶ Components of the home environment including the establishment of food rules, availability of certain foods, and family/parental influences and behaviors, along with the impact these components can have on child weight status within the home environment, have previously been studied. However, while several studies have investigated these factors of the home environment,

gaps in the research regarding specific food rules used within the home and their associations with weight status still exist.

The current study aims to investigate specific food rules within the home environment that are impacting child weight status and to determine if those rules differ among children who are normal weight and those who are overweight/obese. Specifically, scores for food rules indicated by parents of children who are normal weight will be compared with the scores for parents of children who are overweight or obese to determine if certain food rules have a significant impact on child weight status. It is hypothesized that scores for parenting regarding food will be higher for parents of children who are normal weight when compared with parents of children who are overweight/obese. Overall, this investigation will provide information about which food rules have more of an impact on weight status among children and if those practices regarding parents and food rules need to be modified in order to be more supportive of healthy weight outcomes for their children.

Study Design

Study overview

The *iGrow Readers* study is a wait-list control study utilizing an intervention, which was designed to combat overweight/obesity among children through the delivery of various physical activity and nutrition lessons. The *iGrow Readers* curriculum incorporates a variety of these lessons into the reading and discussion of several popular children's books in the classroom as each book has its own unique learning objectives for both nutrition and physical activity. Some of these objectives include being able to

identify various foods that help maintain health and to participate in exercises that increase the heart rate.

The *iGrow Readers* study participants consisted of 249 parents and 291 preschool aged children paired into dyads, triads, or quads, from various child daycare centers and preschool facilities in the following states: South Dakota, Nebraska, and Minnesota. Children of any weight status were invited to participate; however, they were required to be within the age range of three to five years old throughout the entire duration of the study. Parents had varying weight statuses, relationship statuses (single or married), ethnicities, occupations, education levels, and household incomes. Participating locations were provided with the curriculum and instructors received training on how to implement it successfully after pre-data collection. Then, data were collected again after implementation as part of post-data collection and then once more after follow-up, 6 months later. More details about the original study can be found here (reference Methodology manuscript).

Study population

The present study is a cross-sectional data analysis utilizing child weight status and home environment data from the larger *iGrow Readers* study dataset, specifically from the follow-up visit at 18-20 weeks post-baseline. The present study's population consists of 172 parents and 219 children ages 3-5, which reflects the number of participants who attended the follow-up assessment visit.

Study measures

Child weight status was determined from the BMI variables derived from the height and weight values recorded for child participants at follow-up. Weight was

measured in kilograms to the nearest 0.2 kg using a scale and height was measured in centimeters to the nearest 0.2 cm using a Shorr board. The following BMI percentiles for weight status of children and adolescents ages 2-19 were utilized to classify the weight status of children ages 3-5: <5th percentile (Underweight), ≥5th percentile, <85th percentile (Normal Weight), ≥85th percentile, <95th percentile (Overweight), and ≥95th percentile (Obese) (see Table 1).⁷ For our analyses, underweight and normal children were grouped together, as were overweight and obese children.

The child's home environment was assessed by using the Comprehensive Home Environment Survey⁴⁶, which was completed by parents at follow-up. The CHES asks about various elements of the home environment, including parenting regarding food, home food rules, availability of certain food items, and access to various types of physical activity equipment, among others. The CHES was scored according to directions provided by the developer of the tool. The Parental Policies to Support Healthy Eating section of the CHES utilized in this analysis was scored both by individual questions and overall section as a whole to assess parenting regarding food at home (see Appendix A).

Statistical methods

A combination of t-tests, chi-squared tests, and logistic regressions were used to assess parent and child demographic variables, score for the Parental Policies to Support Healthy Eating of CHES overall, and scores for individual questions of the section. T-tests were used to identify and compare parent age and BMI while chi-squared tests were used to identify and compare parent gender role, parent education level, parent income level, child age, and child gender. Additionally, logistic regressions controlling for parent BMI, parent education level, and child gender were used to assess if child weight status

was impacted by overall parent rule score and also if child weight status differed by individual questions. Odds ratios were reported as part of the logistic regressions to determine how much more likely it would be for parents to have an overweight/obese child depending upon how frequently they had rules or parental eating policies set in place for various food-related behaviors. Then, information from the logistic regressions was used to determine whether the overall score for the section as well as the individual questions were statistically significant in terms of child weight status. Responses were considered statistically significant if their p-values were ≤ 0.05 .

Results

Child and parent demographic information is presented in Table 2. The majority of these variables did not differ between overweight/obese children versus normal weight children. Parent education level, child gender, and parent BMI differed significantly ($p=0.025$, $p=0.003$, and $p=0.050$, respectively) and were subsequently included in analyses examining child weight status (normal weight versus overweight/obese) as the outcome.

The overall score for the Parental Policies to Support Healthy Eating section of the CHES did not significantly differ between normal weight and overweight/obese children ($p=0.916$), however, some individual question scores did (see Table 3). Parents are 4.08 times more likely to have an overweight/obese child if they always/frequently have rules set in place for how many snacks their children are allowed to eat ($p=0.047$). Also, parents are 2.89 times more likely to have an overweight/obese child if they always/frequently have rules set in place for when their children should snack ($p=0.019$). Of those parents who responded always/frequently to the question about having rules for

how many snacks their children eat, 20.9% had children who were overweight/obese compared to 9% of parents who responded never/sometimes to the same question.

Similarly, of those parents who answered always/frequently to the question about having rules for when their children can snack, as 21.5% had children who were overweight/obese compared to 7.1% of parents who responded never/sometimes to the same question.

Discussion & Conclusions

The home environment is complex, as it has many components and can be impacted in different ways. It can play an important role in shaping dietary behaviors that impact weight status, as 68% of calories originate from home food sources and people spend a great deal of time at home.³⁴ According to recent research, the home environment (and parents) may be critical in determining child weight status among young children especially, as the home environment is a key setting for the development of weight status and dietary behavior of children.^{27,32} Six studies reviewed by Gerards and Kremers that focused on utilizing general parenting to prevent/treat child obesity among children from the ages of 2 to 13 had positive effects on at least one outcome measure associated with child weight status.²⁷ According to the synthesized results of all six studies, the children in intervention groups experienced a decrease or reduction in the following weight related outcomes: BMI, adjusted BMI, BMI z-score, waist score, weight gain, and weight-related problem behaviors.³⁵⁻⁴⁰ While these studies and the present study both investigated weight status by utilizing it as an outcome measure, their results differ as the present study found that the home environment, parents included, was associated with higher odds of overweight/obesity among children. Therefore, it can be interpreted by the

difference in these results that despite the existing evidence of the home environment favorably impacting child dietary behaviors, there are still some conflicting findings about the impact that the home environment has on child weight outcomes.

The current study aimed to investigate the associations between food rules within the home environment and preschool-aged child weight status. While the overall score for the Parental Policies to Support Healthy Eating section of the CHES was not significantly associated with child weight status ($p=0.916$), specific rules within that section were (see Table 2).

Parents were more likely to have an overweight/obese child if they always/frequently had rules set in place for how many snacks their children are allowed to eat (OR 4.08, $p=0.047$). Additionally, parents were more likely to have an overweight/obese child if they always/frequently had rules set in place for when their children should snack (OR 2.89, $p=0.019$). Due to the cross-sectional nature of this study, it is unclear if the weight status of the child led to the parental establishment of these rules or if the rules led to the child becoming overweight/obese. Despite issues with temporality, we were able to determine that food rules specific to snacking are associated with weight status in children ages 3-5.

While neither the overall score nor other individual questions in the CHES (including those about which snacks and foods children are allowed to eat, how many servings of fruits and vegetables children should eat, portion sizes and second helpings) were significantly associated with child weight status, examining the responses to these questions and comparing them with previous research provides more information about which food rules and parental eating practices specifically are being implemented at

home by parents with children 3-5 years old. Moreover, comparing findings from the present study to those in other studies helps to inform the effectiveness and impact of food rules in younger versus older children.

According to a qualitative study by Holsten and colleagues that aimed to identify how children make food choices within the home environment, parents construct food options through the purchase and preparation of foods and also impact child food choices by modeling behaviors, supplying information, and establishing rules.⁴³ Moreover, establishing food rules within the home has been associated with improved quality of diet among youth.³¹ However, while the establishment of food rules was associated with positive effects in this study, other studies have found the opposite. A study by Birch and colleagues investigated if restrictive feeding practices encouraged eating in the absence of hunger (EAH) among girls and if the weight status of girls mediated the effects that restrictive feeding practices had on overeating, and therefore, on weight status.⁴⁵ The results indicated that maternal restriction can encourage overeating and that overweight girls at the age of 5 may be genetically subject to being extremely receptive to cues within their environment.⁴⁵ Additionally, Birch states that 5 year old girls who were already overweight and susceptible to increased levels of restriction had the greatest amount of overeating at the age of 9.⁴⁵ Taken together, these findings appear to suggest that food rules implemented by parents at home can either have positive or negative effects on eating behaviors, and ultimately on child weight status, depending on what they entail.

Like Birch's research, the present study investigated some of the food rules that parents implement at home. Questions included in the Child Feeding Questionnaire used

by Birch asked about the extent to which mothers control how much, when, and what their girls eat.⁴⁵ These questions are similar to questions in the Parental Eating Policies section of the CHES, which include: when to snack, how many snacks is your child allowed to eat, how many servings of fruits and vegetables should your child eat, which snacks to eat, no second helpings, limited portion sizes, and limitations on certain food items such as dessert, sweet snacks, and fried snacks. Results from Birch and the present study indicate that certain food rules established by parents at home were associated with overweight/obesity among young children, however the findings in the present study were not restricted to girls only. To strengthen the current research and complement the work done by Birch, eating behaviors of children should be examined in addition to weight status.

A study by Holsten and colleagues also investigated the home environment and found that parents construct food options for their children through the purchase and preparation of certain foods.⁴³ Parents impact their children's food choices by modeling certain behaviors, supplying information, and establishing rules while home food availability ultimately has the most influence on child food choices.⁴³ While Holsten and colleagues found that the food choices children make are influenced by several factors including parent behaviors and the physical home environment,⁴³ the present study focused solely on food rules, likely impacting the breadth of findings. Moreover, Holsten researched older children who may be impacted by rules differently than younger children. Additional parent and home factors could be explored in future studies, as it is unclear if findings in older children (like in the Holsten study) can be extrapolated to

younger children. Together, it seems that food rules can influence child eating choices, but it may differ among children of different weight statuses and ages.

Couch and colleagues found that different factors of the home food environment including parent modeling, setting home food rules (allow/limit), and increased availability of healthy foods in the home, were associated with improved child weight status and dietary quality.³¹ More specifically, parent implementation of allow/limit rules about snacking types, places, and sizes was associated with improved child dietary quality.³¹ Additionally, Couch and colleagues identified an association between child weight status and parenting related to child eating and determined that BMI z-score among children was higher with parent utilization of food restriction and pressure and BMI z-scores were lower with parent modeling, verbal reassurance, and pressure to eat.³¹

However, the present study differs from these results as it found that only two food rules were associated with child overweight/obesity and that parents who implemented rules about snacking were more likely to have an overweight/obese child. Also, the other study found that BMI z-scores either decreased or increased depending on specific parent eating policies, while the present study only found an association between food rules and increased odds of child obesity. Differences in these study findings infer that more extensive studies that include more factors of the home environment related to both child weight status and dietary quality may be able to identify which factors (food rules or not) have the most impact on child weight status, dietary quality or both.

Additionally, the results of the present study likely differ from the other because it primarily investigated food rules and did not include components such as parent modeling and availability of food. The present study also included younger children (ages

3 to 5) while the other included children ages 6 to 11. As mentioned above, older children may be more receptive to food rules and may actually understand them better. Therefore, this could be another reason why the two studies had different results. While these two studies had some differences in terms of results and study design, they also had some similarities worth mentioning. Similar analyses methods and evaluation tools were utilized in both studies as logistic regression models were used to measure the odds of child overweight/obesity and nearly identical questions about home food rules such as no second helpings, limited portion sizes at meals, no dessert except fruit, no sweet snacks, and no fried snacks at home were included in their evaluations. Conflicting results may be attributed to the fact that the other study was a bit more extensive and included other factors of the home environment in both the study implementation and analysis.

Previous research has studied components of the home environment including the establishment of food rules, availability of certain foods, and family/parental influences and their impact on child weight status. Information regarding specific food rules used within the home and their associations with weight status is lacking. However, the findings from this study point to the idea that some food rules are more impactful than others in terms of how they affect child weight status. Additionally, while it is unclear the extent to which the home environment impacts the weight status of children, it is evident that multiple aspects of the home environment need to be examined together when looking at child-related outcomes. More research is needed on the impact of the home environment, including food rules paired with other factors, in young children, as they may be more influenced by their surroundings than older children.

Implications

This study is not without limitations. The overall study sample size calculation was based on being able to detect differences in knowledge and behavior among children in the iGrow Readers study. While this is a fairly large sample, a larger sample size may be needed to detect differences in CHES scores between child weight status groups. Due to the cross-sectional nature of the present study, we cannot determine temporality in regards to if the weight status of the child is what influenced the establishment of rules or if the rules were established and led to overweight/obese weight status. Finally, findings from this analysis may not be applicable to other races or age groups of children. Children of different races may vary in terms of practiced cultures, which could impact their eating habits or the food rules that their parents expect them to follow. Also, children of older age groups may be more receptive to food rules and perhaps a stronger association between these food rules and their weight status could be identified.

While this study has some limitations, it also has strengths worth mentioning. First, the percentage of children in this study classified as overweight/obese was 17%, which is similar to the national prevalence of overweight (21-24%) and obesity (17%) among children, indicating that the sample included in this analysis is likely representative of the general population in terms of weight. Another strength is the fact that the larger study included children of different weight statuses rather than just overweight or obese, which also makes the sample more representative of the general population.

Figure 1. Five Levels of the Social Ecological Model (SEM)¹⁰

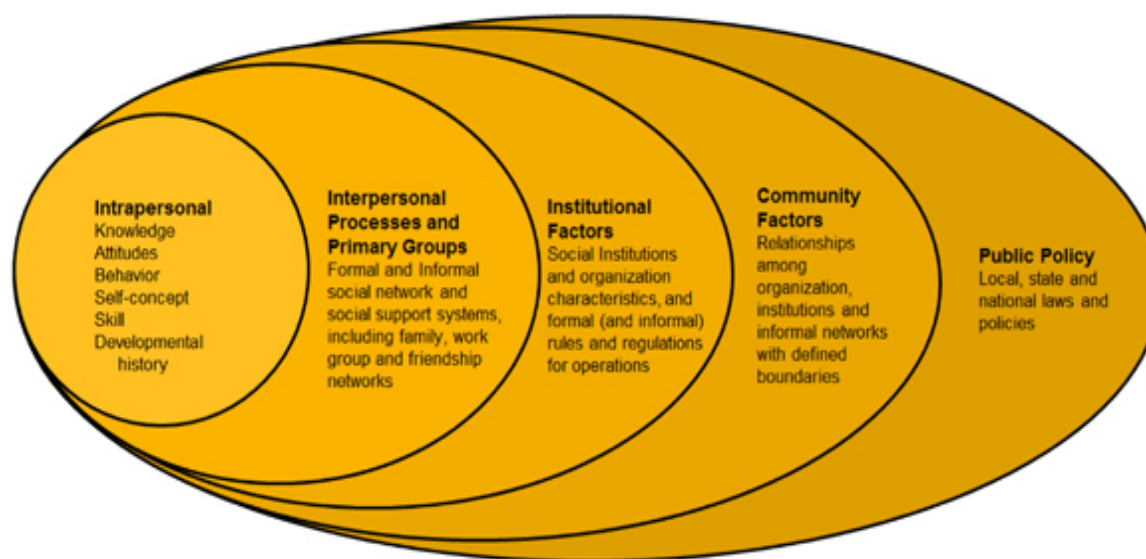


Table 1. Weight Status of Children and Adolescents ages 2-19 as determined by BMI Percentile⁷

Weight Status	BMI Percentile
Underweight	<5 th percentile
Normal Weight	≥5 th percentile, <85 th percentile
Overweight	≥85 th percentile, <95 th percentile
Obese	≥95 th percentile

Table 2. Demographic Characteristics of Parents and Children

Characteristic	Normal Weight Child	Overweight/ Obese Child	Total	P-value
<i>Children</i>				
Gender*				0.003
Female	51.0 (97)	76.92 (30)	55.5 (127)	
Male	48.9 (93)	23.1 (9)	44.5 (102)	
Age (y)*				0.351
3	48.9 (93)	48.7 (19)	48.9 (112)	
4	38.4 (73)	46.1 (18)	39.7 (91)	
5	12.6 (24)	5.1 (2)	11.3 (26)	
<i>Adults</i>				
Gender Role*				0.957
Mother	83.4 (156)	83.8 (31)	83.5 (187)	
Father	16.6 (31)	16.2 (6)	16.5 (37)	
Age (y)**	34.62	33.92		0.563
Education Level*				0.025
High School Diploma	11.9 (21)	29.4 (10)	14.7 (31)	
Associates or Bachelors Degree	53.7 (95)	38.2 (13)	51.2 (108)	
Masters or Doctorate Degree	34.5 (61)	32.3 (11)	34.1 (72)	
Income Level*				0.480
<\$60,000	22.9 (40)	28.6 (10)	23.9 (50)	
\$60,000+	77.0 (134)	71.4 (25)	76.1 (159)	
BMI**	27.95	31.48		0.050

1

¹ *chi-squared test

**t-test

Table 3. Measured Predictors of Overweight/Obese Status of Children within the Home Environment

Questions from Parental Eating Policies Section of CHES	n	Mean \pm Std. Dev.	P-Value	Odds Ratio	95% Confidence Interval
<i>How often did you...</i>					
Avoid going to cafes or restaurants with your children, which sell unhealthy foods?**	193	0.53 \pm 0.27	0.759	0.87	[0.37, 2.05]
Avoid buying sweets and chips or salty snacks and bringing them into the house?**	192	0.52 \pm 0.23	0.543	0.76	[0.31, 1.84]
Not buy foods that you would like because you do not want your children to have them?**	192	0.47 \pm 0.23	0.893	1.06	[0.42, 2.65]
Use food as a reward for your child?**	193	0.62 \pm 0.20	0.779	1.12	[0.49, 2.56]
Use food as a punishment for your child?**	193	0.93 \pm 0.15	-	-	-
Prepare meals with your child?**	193	0.55 \pm 0.18	0.629	0.80	[0.33, 1.95]
Plan meals/menus with your child?**	193	0.45 \pm 0.21	0.099	2.16	[0.86, 5.41]
Offer healthy snacks when your child was hungry?**	193	0.76 \pm 0.14	0.159	0.47	[0.16, 1.34]
Eat breakfast with your child?**	193	0.55 \pm 0.26	0.420	0.69	[0.28, 1.69]
Eat dinner with your child?**	193	0.90 \pm 0.14	-	-	-
Have regularly scheduled meals and snacks with your family?**	193	0.79 \pm 0.20	0.160	0.48	[0.17, 1.33]
Allow your child to eat snacks or sweets without permission?**	193	0.80 \pm 0.19	0.296	1.77	[0.60, 5.18]
Allow your child to take soft drinks whenever he/she wants?**	193	0.97 \pm 0.10	0.839	1.29	[0.10, 16.26]
Give your child soft drinks or snacks if he/she asks?**	193	0.70 \pm 0.25	0.874	1.07	[0.46, 2.51]
Give your child something else if they did not like what was prepared?**	193	0.68 \pm 0.20	0.469	1.35	[0.59, 3.09]
<i>Do you have the following food rules in your home...</i>					
How many servings of fruits & vegetables your child should eat**	193	0.39 \pm 0.50	0.179	1.76	[0.77, 4.03]
How many snacks is your child allowed to eat**	193	0.67 \pm 0.47	0.047	2.89	[1.01, 8.26]

When to snack**	193	0.71 ± 0.45	0.019	4.08	[1.25, 13.27]
Which snacks to eat**	193	0.75 ± 0.44	0.297	1.71	[0.62, 4.69]
No second helpings at meals**	193	0.05 ± 0.22	-	-	-
Limited portion sizes at meals**	193	0.22 ± 0.42	0.653	0.79	[0.30, 2.13]
No dessert except fruit**	193	0.06 ± 0.24	0.996	1.00	[0.19, 5.25]
No sweet snacks**	192	0.09 ± 0.29	0.320	0.44	[0.09, 2.22]
No fried snacks at home (such as potato chips)**	192	0.12 ± 0.32	0.305	0.43	[0.09, 2.14]
Avoid going to cafes or restaurants with your children which sell unhealthy foods**	193	0.24 ± 0.43	0.551	0.73	[0.27, 2.01]
Avoid buying sweets and chips or salty snacks and bringing them into the house**	192	0.27 ± 0.44	0.070	0.37	[0.12, 1.08]
Overall Score for Parental Eating Policies**	193	13.8 ± 2.99	0.916	0.99	[0.86, 1.14]

2

² - no data available

**t-test

Logistic regressions controlling for parent BMI, parent education level, and child gender were used to assess if child weight status was impacted by overall parent rule score and also if child weight status differed by individual questions.

APPENDIX

CHES Section – Parental Policies to Support Healthy Eating:

PART I: Based on the past 30 days, thinking about your food and meal behaviors, please circle the appropriate response for each statement

1. How often did you... (please circle your response)

	Never	Rarely	Sometimes	Frequently	Always
Eat healthy meals or snacks while your child was around? ("healthy" defined as fruits, vegetables, low-fat foods, lean meats, whole grains etc.)	0	1	2	3	4
Eat meals in the living room or TV room?	0	1	2	3	4
Take a second helping during meals?	0	1	2	3	4
Eat unhealthy snacks around your children?	0	1	2	3	4
Drink sugared drinks or non-diet soda around your children?	0	1	2	3	4
Avoid going to cafes or restaurants with your children which sell unhealthy foods?	0	1	2	3	4
Avoid buying sweets and chips or salty snacks and bringing them into the house	0	1	2	3	4
Not buy foods that you would like because you do not want your children to have them?	0	1	2	3	4

PART J: Based on the last 30 days, thinking about your parenting regarding food, please circle your answers.

1. How often did you... (please circle your response)

	Never	Rarely	Sometimes	Frequently	Always
Use food as a reward for your child?	0	1	2	3	4
Use food as a punishment for your child?	0	1	2	3	4
Prepare meals with your child?	0	1	2	3	4
Plan meals/menus with your child?	0	1	2	3	4
Offer healthy snacks when your child was hungry?	0	1	2	3	4
Eat breakfast with your child?	0	1	2	3	4
Eat dinner with your child?	0	1	2	3	4
Have regularly scheduled meals and snacks with your family?	0	1	2	3	4
Allow your child eat snacks or sweets without permission?	0	1	2	3	4
Allow your child to take soft drinks whenever he/she wants	0	1	2	3	4
Give my child soft drinks or snacks if (s)he asks	0	1	2	3	4
Give your child something else if they did not like what was prepared	0	1	2	3	4

2. Do you have the following food rules in your home.... (please circle your response)

How many servings of fruit and vegetables your child should eat	Yes	No
How many snacks is your child allowed to eat	Yes	No
When to snack	Yes	No
Which snacks to eat	Yes	No
No second helpings at meals	Yes	No
Limited portion sizes at meals	Yes	No
No dessert except fruit	Yes	No
No sweet snacks	Yes	No
No fried snacks at home (such as potato chips)	Yes	No
Avoid going to cafes or restaurants with your children which sell unhealthy foods?	Yes	No
Avoid buying sweets and chips or salty snacks and bringing them into the house	Yes	No

3. When it is mealtime and your child is not hungry what would you usually do?
(please circle your response)

Suggest the child sit down at the table but not eat	Suggest the child eat later	Suggest the child sit down at the table but eat less	Convince the child to eat a full meal with the family	It never happens, the child is always hungry
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4. Do you buy food upon your child's request? (please circle your response)

a. Fruits and vegetables:

Not at all Rarely Sometimes Quite A Bit Very Much

b. Snacks or sugary cereal:

Not at all Rarely Sometimes Quite A Bit Very Much

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