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EFFECTS OF SPECIFIC HOME ENVIRONMENT FACTORS ON A CHILD'S
WEIGHT

BY
MOLLY MILLAGE

A thesis submitted in partial fulfillment of the requirements for the

Master of Science

Major in Nutrition/ Exercise Sciences

Specialization in Nutritional Science

South Dakota State University

2018

EFFECTS OF SPECIFIC HOME ENVIRONMENT FACTORS ON A CHILD'S
WEIGHT

MOLLY MILLAGE

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

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ABSTRACT

EFFECTS OF SPECIFIC HOME ENVIRONMENT FACTORS ON A CHILD'S
WEIGHT

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2018

Background: In 2011-2014 8.9% of children 2-5 years old were classified as obese.

Obesity in children predisposes them to negative health and psychological consequences. One of the most significant factors that influences a child is the physical environment the child is exposed to, which includes the home environment.

Objective: The purpose of this study was to examine how the home environment ie. cooking equipment, food preparation/availability, and frequency of family meals eaten at home, contribute to childhood obesity in children 3-5 years old.

Design: This study was a cross-sectional analysis of the iGrow Readers study.

Participants/setting: Total of 229 parent/child dyads but sample size varied for individual analyses depending on available data.

Intervention: The Comprehensive Home Environment Survey (CHES) was assessed at follow-up by the parent and specific categories and questions were taken from the CHES and analyzed.

Statistical analyses performed: T-test and chi-squared analyses were performed using Stata Version 14.

Results: Lack of counter and cupboard space along with decreased frequency of family meals increased the probability of having a child that was overweight or obese. Fruit and vegetable availability decreased the probability of having a child that was overweight or

obese.

Conclusion: Many home environment factors, especially the kitchen environment and family meals, may be contributing to a child's weight status.

INTRODUCTION

Obesity is a vast problem in the United States today. Between 2011 – 2014, 36.5% of adults were classified as obese,¹ quantified as a body mass index (BMI) ≥ 30 .² In 2015, all fifty states had an obesity prevalence of 20% or greater.³ Future projections predict that by 2030 more than 44% of adults in fifty states will be obese and in 13 states, obesity prevalence among adults will exceed 60%.⁴

Obesity does not just affect adults; it also affects many children and adolescents. 17% of youth aged 2-19 years were obese in 2011-2014.¹ Overall, obesity prevalence among preschool-aged children 2-5 years old was 8.9%, school-aged children 6-11 years old was 17.5%, adolescents 12-19 years old was 20.5% in 2011 – 2014.¹ For children, obesity is a BMI equal to or greater than 95th percentile.² Childhood obesity predisposes children to many negative health consequences later in life, such as insulin resistance, type 2 diabetes, hypertension, stroke, hyperlipidemia, liver and kidney diseases, certain types of cancer, and sleep apnea.^{5,6} Obese children are also predisposed to negative psychological affects such as depression, low self-concept, and even negative body image.⁶ It is extremely important to focus research on preventing and reducing obesity in children because obese children are more likely to be overweight/obese as an adult.⁵

Many different factors can influence a child's weight status. One of the most significant factors is the physical environment the child is exposed to.² Different physical environments children are exposed to include school, family/home, and community environments.^{5,6} A child's home environment is thought to be the key influencer of future weight status.⁶ At an early age, children begin to assimilate into the family and home environment including food preparation and eating patterns.⁷ Recent studies have shown

how various family/home factors can directly influence a child's weight. Parental characteristics such as education level, household income, employment status, parental behaviors, and parental weight status are associated with the family and home environment, thus affecting their children.⁶⁻¹⁰

Parental education, income/socioeconomic status (SES), and employment status are all three linked in their association with the family and home environment. Parents that have less education were found to be more likely to have more energy-dense food, such as sports drinks, potato chips, and soft drinks in the home than those parents with a higher education.^{8,11} Data from the National Health and Nutrition Examination Survey (NHANES) indicated that lower SES and less educated households faced many barriers such as time and money, which interfered with their ability to provide a healthful home environment and support healthy eating behaviors.¹² Results from a cross-sectional study of 103 families with children ages 6-13 denoted that lower SES families have limited resources in the home that lead to less healthful eating.¹³

Project EAT was a study done by the University of Minnesota to investigate specific environmental, personal, and behavioral determinants that influence physical activity, nutritional intake, and weight status among a diverse group of socioeconomic and ethnic young individuals studied.⁹ A cross-sectional analysis of data from this study indicated that mothers employed full-time reported having less frequent family meals, more frequent fast food for family meals, spending less time preparing food, and consuming fewer fruits and vegetables when compared to mothers who work part-time or are not employed.⁹ The same study also found that fathers employed full-time spent less time preparing food compared to part-time or unemployed fathers.⁹ In the Project EAT

study, analyses from both mothers and fathers showed that high levels of work-life stress were associated with less healthful family food environments and less healthful dietary patterns.⁹ Education, income, and employment status are not the only factors associated with family and home environment.

Parental behaviors and weight status are also very influential on a child's weight. A review focused on the Ecological Systems Theory (EST) related to predictors of overweight children stated that parents are the role models to their children, thus influencing their child's eating patterns.⁶ That same review also stated that overweight parents presumably increase their child's risk of being overweight from the practices that they themselves have adopted.⁶ Parents or caregivers of children have a strong impact on their child's weight through their control of the home environment through their demographics, behaviors, and lifestyle.

Cooking skills, food preparation, cooking equipment, and frequency of family meals also has a major impact on a child's weight.^{7,12,14-18} In today's society, cooking skills have declined, presenting a barrier to healthy cooking, thus leading to low diet quality and obesity.^{14,15} Compared to the 1960's, Americans spend 40% less time cooking.⁷ One reason for the decline in cooking can be related to the increase in microwave ovens, food processors, and other food preparation equipment that is highly efficient.¹² Other barriers to home cooked meals and decline in cooking is lack of time and limited food preparation supplies, thus decreasing the amount of family meals.^{12,13} A cross-sectional study from the Home Environment Comparison Study (HECS) assessed the access of 41 different food preparation supplies in the home and found that the presence of food preparation supplies in the home were positively associated with family

meal frequency and consumption of home-prepared meals.¹³ The University of Minnesota conducted a randomized control study called Healthy Home Offerings via the Mealtime Environment (HOME) Plus Intervention to increase frequency and healthfulness of family meals and snacks to promote healthy eating and activity behaviors and prevent obesity.¹⁹ Data from the HOME Plus Intervention inferred that 57% of parents claimed they don't prepare home cooked meals/buy prepackaged meals because they don't have time, 33% use prepackaged foods as a convenience, and 22% use prepackaged meals because they do not know what else to make.²⁰ Findings from a cross-sectional analysis of data from Project EAT showed a positive association between quality of dietary intake and the frequency of family meals.¹⁸ These positive associations included higher intakes of fruits, vegetables, grains, proteins, and calcium-rich foods, and a negative association with soft drink intake.¹⁸ Consumption of family meals is associated with a healthier diet including higher intake of fiber, calcium, folate, iron, vitamins B₆, B₁₂, C, and E and decreased intake of saturated and trans fat.^{7,16} A cross-sectional analysis from the HOME Plus study used baseline data and found a significant positive association between a child's mean fruit and vegetable intake and overall dietary quality with family dinner frequency.²¹ Survey data extracted from EAT 2010 and Project F-EAT collected on adolescents and caregivers concluded that better diet quality and eating patterns were found in adolescents who were involved in food preparation for the family meals.¹⁷ Moreover, family meals are also associated with various health benefits such as weight control, reduced risk of eating disorders, increased consumption of fruits and vegetables, less consumption of calorie dense foods, and decreased risk for childhood obesity.^{17,22}

Meals cooked at home are generally lower in fat, saturated fat, cholesterol, and lower in calories.²³ In 1977-78 on average American's consumed 17.7% of calories away from home, while in 2005-08 calories consumed away from home in table service and fast food restaurants increased to 31.6%.²⁴ Restaurant meals have been found to have 55% higher energy content than a home prepared meal.²³ On average eating one meal away from home each week corresponds to an extra 2 pounds gained each year.²⁵ One study found that in children ages 2-11 years old fast-food and full-service restaurant consumption led to a daily increase of 160.49 kcal and in adolescents 12-19 years old a 267.30 - 309.53 kcal daily increase with a higher intake in regular soda and sugar-sweetened beverages.²⁶ This is further evidence that the home environment and home-prepared meals are an important component in maintaining and living a healthy lifestyle to reduce obesity, especially childhood obesity.

While we know parental education, income, employment status, cooking skills, food preparation, and family meal frequency can affect a child's weight status, there is a lack of research making connections with how home cooking equipment, food preparation, and the frequency of family meals together affect a child's weight. Furthermore, the research that has been done on home environment factors has largely been done in adolescents, making it unclear how these home environment factors impact children of younger ages. Therefore, the purpose of this cross-sectional study was to examine how the home environment contributes to childhood obesity. More specifically, this study will be looking at how available cooking equipment, food preparation/food availability, and frequency of family meals eaten at home affect a child's weight. We hypothesize there were be a negative association between a child's weight status and the

availability of cooking equipment, food preparation/food availability, and frequency of family meals eaten at home.

METHODS

Project Background

iGrow Readers is a program developed by SDSU Extension designed to help fight childhood obesity in South Dakota. The program, which consists of an 8-week curriculum, was developed for children pre-k to 3rd grade. The core of the program is taking popular children's books that can be found in a library or at a school and incorporating physical activity and nutrition activities that relate to the story. The resources that go along with the books are free for parents, teachers, and childcare providers. Each storybook has several specific nutrition and physical activities that are designed for a specific age group. The activities can be easily adapted to the population they are being presented to. Overall, the goal is to expose children to new foods, physical activities, and show children that nutrition and physical activity can be fun. For more information, visit: <http://igrow.org/healthy-families/health-and-wellness/igrow-readers/>.

Study design

A research study to examine the efficacy of iGrow Readers in changing diet and physical activity knowledge and behavior took place between July 15, 2014 and June 30, 2016. Participating centers were located in Brookings, South Dakota (SD), Sioux Falls, SD, Omaha Nebraska (NE), and Lincoln, NE. Preschool center directors were connected via email with background information on the iGrow Readers study. Participants were then recruited through the day care/preschool centers that participated in the iGrow Readers curriculum and implementation in the fall of 2014. Children and parents were

informed and recruited of the study through flyers, an informational letter sent home, and an informational email. Parental consent and verbal consent from the child was obtained. All participants that returned consent forms were allowed to participate in the study. A total of 745 individuals participated including children aged 3-5 years, their parents, and their pre-school teachers. Data were collected from September 2014 to May 2015. Data collected came from a pre-intervention, post-intervention, and follow-up assessment 3 months after the post-intervention assessment. For more details about the iGrow Readers study see iGrow Readers Methods paper.

The present study is a cross-sectional analysis of data from the Comprehensive Home Environment Survey (CHES) completed by parents of children enrolled in the iGrow Readers study. This survey was one component of the iGrow Readers study and was assessed at follow-up of the study. More specifically, questions related to home cooking equipment, food preparation/food availability, and frequency of family meals were compared among normal weight children and overweight/obese children.

Participants

A total of 293 parent/child dyads took part in the iGrow Readers study and BMI data were collected for 229 of those children. Sample sizes for individual analyses vary depending on missing data among parents and children.

Procedure

Child height, weight, and body composition was assessed at all 3 study time points, while parent height, weight, and body composition was assessed only at baseline. Height was measured to the nearest 0.1 cm (Adult/Child Shorrboard), weight was measured to the nearest 0.1 kg (Seca Scale 890) and body composition was assessed

(InBody 230 Body Composition Analyzer). Demographic information such as race, employment status, income/SES, and education was collected from the parent at baseline.

Data were collected using the Comprehensive Home Environment Survey (CHES)²⁷, which was administered to parents at follow-up. The CHES was scored using a scoring tool provided by the CHES developer. This tool scores on each of the categories based on the individual questions in those categories. Points are given for positive and/or healthy behaviors, and higher scores are considered better.

This current cross-sectional analysis looked at the following categories of the CHES; fruit, juice, and vegetable availability, fat and sweets availability, family meal time, parental policies to support healthy eating, and kitchen environment. More specifically, questions that relate to these categories were analyzed. These questions pertain to the kitchen environment including space and appliances, fruit and vegetable availability, fruit juice availability, fat and sweets availability, snack availability, frequency of eating dinner together as a family, and meal preparation/planning meals together. For the specific questions in each category go to Appendix A.

Data Analysis/Statistical Analysis

All analyses were conducted using Stata Version 14.²⁸ Initially, total scores between groups in the CHES were compared using a t-test. Individual scores for questions from the CHES were compared using a t-test. Responses between the category groups in the CHES were compared using chi-squared test. A two-sided p-value of 0.05 was used to determine level of significance.

We further examined the impact of child and parent sociodemographic variables on the CHES outcome variables, controlling for those that differed statistically between

groups (normal weight children vs. overweight/obese children). Normal weight was defined using the BMI chart and falling below the 85th percentile for height and weight. Overweight/obese was defined using the BMI chart and falling above the 85th percentile for height and weight. While no difference was seen between groups for child age ($p = 0.35$), parent age ($p = 0.56$), gender ($p = 0.96$), or income ($p = 0.48$), there was significance difference between groups for child gender ($p = 0.003$), parent BMI ($p = 0.05$), and parent education ($p = 0.025$). Ultimately, these three variables were adjusted for in the statistical analysis.

RESULTS

Overall, complete BMI data were collected for 229 children ($n=127$ female).

Child and parent demographic information can be found in Tables 1 and 2.

The overall kitchen environment score was not significantly associated with child weight status (normal weight vs. overweight/obese). When examining questions individually, counter space ($p = 0.023$) and cupboard space ($p = 0.036$) were found to be significantly associated with child weight status (Table 3). The overall fruit, juice, and vegetable availability score was significantly associated with child weight status ($p = 0.003$; Table 3). The overall fat and sweet availability score was not significantly associated with child weight status. When examining questions individually, pretzels ($p = 0.022$) were found to be significantly associated weight child weight status (Table 3). The overall snack availability category score was not significantly associated with child weight status, nor were any of the individual questions in the snack availability category (Table 3).

The category of eating dinner together was combined into two categories, including eating meals together 1-4 days per week or eating meals together 5-7 days per week. Number of meals eaten together was significantly associated with child weight status, such that eating meals together 5-7 days a week was positively associated with child's BMI ($p = 0.004$; Table 3). The overall meal preparation with child score was not significantly associated with child weight status (Table 3). The overall meal planning with child score was not significantly associated with child weight status (Table 3).

DISCUSSION

This cross-sectional analysis examined how the home environment, specifically the kitchen environment, meal preparation, and frequency of family meals, was associated with child weight status (normal weight vs. overweight/obese) among preschool children aged 3-5 years. Findings indicate that some kitchen aspects along with eating family meals together are negatively associated with childhood obesity. These results are in line with the findings of previous studies, such as the Home Environment Comparison Study (HECS).¹³

The most novel finding in this study was the association between counter space, cupboard space, and a child being overweight or obese. There have been few studies that have looked into specific kitchen environment factors relating to obesity. Limited counter space can mean less space to cook and prepare meals and also less space to store appliances used to prepare meals. Limited cupboard space can mean not enough space to store appliances or foods used to prepare home cooked meals. Having limited space to cook, store appliances, and store foods can mean less home prepared meals and more away from home or restaurant meals. Restaurant meals have been found to have 55%

higher energy content than home prepared meals.²³ The cross-sectional analysis of the HECS also found that a lack of appliances in the home lead to less home prepared meals and less frequent family meal times.¹³ One explanation for the lack of these appliances could be the lack of counter and cupboard space. The findings of this current study further emphasize the importance and impact the kitchen environment has on a child's weight status.

Present findings in terms of odds ratios under the category of fat and sweets availability, pretzels within the home were associated with decreased odds of a child being overweight or obese. One reason for this significance can be related to the fact that pretzels are a low-fat and lower in calories when compared to potato chips. Pretzels are also high in fiber making you feel fuller. They are a cheap, non-messy, and convenient snack to give to children, especially children in the age range of 3-5. Previous research has not listed specific snack foods, such as pretzels being related to a child's weight status. But previous studies have found that higher intakes of fruits, vegetables, grains, proteins, and calcium-rich foods were associated with overall greater dietary quality.¹⁸

Eating dinner as a family has been shown to have a significant impact on a child's weight. The current study findings directly align with recent research, however it is one of the first to look at children ages 3-5 years old. The present study found that families that ate 5-7 meals together a week were less likely to have a child that was overweight or obese. Project EAT found a positive association between a high quality dietary intake and family meals for children ages 9 – 14 years old.¹⁸ Together, these findings could indicate that by having more frequent family meals, children receive more nutritious and healthful

foods, such as fruits, vegetables, whole-grains, and proteins. Family meals not only increase diet quality, but also decrease risk for childhood obesity.²²

A strength of the current study was the age group of the children that participated. Prior research has largely focused on adolescents, while studies focusing on younger children are lacking. Another strength of this study was the use of the all-inclusive Comprehensive Home Environment Survey (CHES) tool, which assesses numerous aspects of the home environment, including specific kitchen environment factors. Recent research lacks at looking at the association between the kitchen environment and childhood obesity.

The current study is not without limitations. One limitation of the study was that the Comprehensive Home Environment Survey (CHES) was only assessed in the parents at follow-up. A second limitation is that the current study is a cross-sectional analysis, so temporality cannot be determined. A third limitation is generalizability. This study is limited to children in the Midwest, since this study took place in South Dakota and Nebraska. Also, a majority of the parents had an income of > \$60,000/year and most had a college education.

CONCLUSION

The results of this study have large significance in today's society, since childhood obesity is on the rise. Recent and past research mostly focuses on one aspect such as frequency of family meals or food preparation in the home but many lack in combining home and kitchen environment factors into one study. This study was unique in that more than one home environment factor was considered when looking at its affect on childhood obesity. Being able to show the association between specific kitchen and

home environment factors that lead to an increase in a child's weight status can now help public health officials and researchers focus their attention on these issues. They can create and reorganize programs to focus on easy, simple, healthy recipes for families with limited kitchen space and time. This current study was novel in its significant findings of the impact of counter and cupboard space. The use of CHES made this current study a success in the significance and finding. A follow-up study could look more specifically at counter and cupboard space by assessing what is specifically on everyone's counter and in his or her cupboards. Because of the lack of space they could have more prepackaged ready to eat foods that are not nutrient dense and that could be why there is an association between those two and overweight/obese children.

TABLES

Table 1. Child Demographics

| | Not Overweight/ Obese | Overweight / Obese | p-value |
|-------------------|--------------------------------------|-------------------------------|----------------|
| Gender | | | 0.003 |
| Male, n=102 | 93 | 9 | |
| Female, n=127 | 97 | 30 | |
| | | | |
| Age | | | 0.35 |
| 3 years | 93 | 19 | |
| 4 years | 73 | 18 | |
| 5 years | 24 | 2 | |
| | | | |
| TOTAL | 190 (82.97%) | 39 (17.03%) | |
| | | | |
| Child BMI | 190 | 39 | |
| Parent BMI | 86 | 112 | |
| TOTAL | 276 (64.6%) | 151 (35.4%) | |

* Nine children were underweight but for analysis they were paired with the normal weight children.

Table 2. Parents Demographics based on Child's Weight Status

| | Not Overweight/ Obese | Overweight/ Obese | p-value |
|-----------------------|--------------------------------------|------------------------------|----------------|
| Gender Role | | | 0.96 |
| Father, n = 37 | 31 | 6 | |
| Mother, n = 187 | 156 | 31 | |
| BMI | 160 | 34 | 0.05 |
| Age | 186 | 38 | 0.56 |
| Income | | | 0.48 |
| < \$10,000 - \$60,000 | 40 | 10 | |
| > \$60,000 | 134 | 25 | |
| Education | | | 0.025 |
| High School | 21 | 10 | |
| College | 95 | 13 | |
| Post College | 61 | 11 | |

Table 3. Kitchen Environment, Food Availability, and Family Meal Statistics

| Category | OR (95% CI) | p-value |
|--|-------------------------|----------------|
| Kitchen Environment | 0.73 (0.39 – 1.31) | 0.291 |
| Counter Space | 0.12 (0.19 – 0.74) | 0.023 |
| Refrigerator | 1.02 (0.19 – 0.74) | 0.205 |
| Cupboard Space | 0.15 (0.027 – 0.88) | 0.036 |
| Microwave | 1.02 (0.98 – 1.06) | 0.205 |
| Toaster | 1.02 (0.98 – 1.05) | 0.227 |
| Steamer | 1.11 (0.49 – 2.5) | 0.795 |
| Oven | 1.02 (0.98 – 1.06) | 0.204 |
| | | |
| Fruit, Juice, and Vegetable Availability | 0.87 (0.80 – 0.95) | 0.003 |
| | | |
| Fat and Sweets Availability | 0.86 (0.71 – 1.04) | 0.139 |
| Chips | 0.24 (0.053 – 1.15) | 0.076 |
| Popcorn | 0.99 (0.23 – 4.21) | 0.999 |
| Nuts | 2.81 (0.79 – 9.92) | 0.108 |
| Crackers | 0.48 (0.087 – 2.68) | 0.407 |
| Pretzels | 0.18 (0.042 – 0.77) | 0.022 |
| Sunflower Seeds | 0.32 (0.084 – 1.21) | 0.095 |
| | | |
| Snacks | 0.42 (0.015 – 11.79) | 0.613 |
| Sugar Drinks | 0.46 (0.14 – 1.52) | 0.206 |
| Soft Drinks | 0.83 (0.26 – 2.62) | 0.754 |
| Drinks | 0.47 (0.0072 – 30.57) | 0.724 |
| Candy | 0.28 (0.059 – 1.33) | 0.111 |
| Cookies | 0.29 (0.035 – 2.46) | 0.261 |
| Cake | 0.36 (0.063 – 2.05) | 0.251 |
| Ice Cream | 0.70 (0.16 – 3.01) | 0.633 |
| Chocolate | 0.71 (0.15 – 3.28) | 0.671 |
| Sweets | 3.53 (0.0029 – 4249.64) | 0.727 |
| | | |
| Eating Dinner Together | | |
| 5 - 7 days | 0.26 (0.10 – 0.64) | 0.004 |
| | | |
| Prepare Meal with Child | 0.80 (0.33 – 1.94) | 0.629 |
| | | |
| Plan Meals with Child | 2.16 (0.86 – 5.41) | 0.099 |

APPENDIX A

CHES questions:

Kitchen Environment:

1. In your kitchen do you have...

| | | |
|--|-----|----|
| adequate counter space to prepare food? | Yes | No |
| adequate refrigerator and freezer space? | Yes | No |
| adequate cupboard storage space? | Yes | No |
| a microwave? | Yes | No |
| a toaster? | Yes | No |
| a steamer? | Yes | No |
| a stove Top? | Yes | No |
| an oven? | Yes | No |

Fruit and Vegetable Availability:

1. How often did you have the following fruits (fresh, canned, or frozen) in your house?

| | Never | Rarely | Sometimes | Frequently | Always |
|---------------------------|-------|--------|-----------|------------|--------|
| Apples | 0 | 1 | 2 | 3 | 4 |
| Oranges | 0 | 1 | 2 | 3 | 4 |
| Bananas | 0 | 1 | 2 | 3 | 4 |
| Grapes | 0 | 1 | 2 | 3 | 4 |
| Pears | 0 | 1 | 2 | 3 | 4 |
| Strawberries | 0 | 1 | 2 | 3 | 4 |
| Blueberries/ blackberries | 0 | 1 | 2 | 3 | 4 |
| Kiwi | 0 | 1 | 2 | 3 | 4 |
| Cantaloupe/Melon | 0 | 1 | 2 | 3 | 4 |
| Pineapple | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---------------------|---|---|---|---|---|
| Peaches/ nectarines | 0 | 1 | 2 | 3 | 4 |
| Plum | 0 | 1 | 2 | 3 | 4 |
| Applesauce | 0 | 1 | 2 | 3 | 4 |
| Fruit Salad | 0 | 1 | 2 | 3 | 4 |
| Watermelon | 0 | 1 | 2 | 3 | 4 |
| Mango | 0 | 1 | 2 | 3 | 4 |
| Other: _____ | 0 | 1 | 2 | 3 | 4 |

2. How often did you have the following vegetables (fresh, canned, or frozen) in your house?

| | Never | Rarely | Sometimes | Frequently | Always |
|--|-------|--------|-----------|------------|--------|
| Asparagus | 0 | 1 | 2 | 3 | 4 |
| Beans (baked, lentils, kidney, etc.) | 0 | 1 | 2 | 3 | 4 |
| Beets | 0 | 1 | 2 | 3 | 4 |
| Bell Pepper (red, green, or yellow) | 0 | 1 | 2 | 3 | 4 |
| Broccoli | 0 | 1 | 2 | 3 | 4 |
| Brussel Sprouts | 0 | 1 | 2 | 3 | 4 |
| Cabbage | 0 | 1 | 2 | 3 | 4 |
| Carrots | 0 | 1 | 2 | 3 | 4 |
| Cauliflower | 0 | 1 | 2 | 3 | 4 |
| Celery | 0 | 1 | 2 | 3 | 4 |
| Corn | 0 | 1 | 2 | 3 | 4 |
| Cucumber | 0 | 1 | 2 | 3 | 4 |
| Green Beans | 0 | 1 | 2 | 3 | 4 |
| Greens (mustard, collard, kale, spinach, swiss chard etc.) | 0 | 1 | 2 | 3 | 4 |
| Lettuce | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|-----------------------------------|---|---|---|---|---|
| Mixed vegetables | 0 | 1 | 2 | 3 | 4 |
| Mushroom | 0 | 1 | 2 | 3 | 4 |
| Onion (green, red, white, yellow) | 0 | 1 | 2 | 3 | 4 |
| Peas | 0 | 1 | 2 | 3 | 4 |
| Potatoes | 0 | 1 | 2 | 3 | 4 |
| Squash (acorn, zucchini etc.) | 0 | 1 | 2 | 3 | 4 |
| Sweet Potatoes/ Yams | 0 | 1 | 2 | 3 | 4 |
| Tomatoes | 0 | 1 | 2 | 3 | 4 |
| Other: _____ | 0 | 1 | 2 | 3 | 4 |

Fruit Juice Availability:

3. How often did you have the following juices in your house (fresh, frozen, bottled, or canned)?

| | Never | Rarely | Sometimes | Frequently | Always |
|---|-------|--------|-----------|------------|--------|
| Apple juice | 0 | 1 | 2 | 3 | 4 |
| Grape juice | 0 | 1 | 2 | 3 | 4 |
| Orange juice | 0 | 1 | 2 | 3 | 4 |
| Fruit juice blend | 0 | 1 | 2 | 3 | 4 |
| Vegetable juice (e.g., V8, tomato juice) | 0 | 1 | 2 | 3 | 4 |
| Other: Specify _____ | 0 | 1 | 2 | 3 | 4 |

Fat and Sweets Availability:

4. How often did you have the following snack items in your house?

| | Never | Rarely | Sometimes | Frequently | Always |
|----------------------|-------|--------|-----------|------------|--------|
| Chips | 0 | 1 | 2 | 3 | 4 |
| Popcorn | 0 | 1 | 2 | 3 | 4 |
| Nuts | 0 | 1 | 2 | 3 | 4 |
| Crackers | 0 | 1 | 2 | 3 | 4 |
| Pretzels | 0 | 1 | 2 | 3 | 4 |
| Sunflower Seeds | 0 | 1 | 2 | 3 | 4 |
| Other: Specify _____ | 0 | 1 | 2 | 3 | 4 |

Snack Availability:

5. How often did you keep the following drinks (boxed, canned, powdered) in your house?

| | Never | Rarely | Sometimes | Frequently | Always |
|---|-------|--------|-----------|------------|--------|
| Sugared Drinks (Sports drinks, Kool-aid®, boxed or bottled fruit flavored drinks, sweetened teas) | 0 | 1 | 2 | 3 | 4 |
| Non-diet Soft Drinks (ie. Soda, Carbonated beverages) | 0 | 1 | 2 | 3 | 4 |
| Other: Specify _____ | 0 | 1 | 2 | 3 | 4 |

6. How often did you have the following sweets/dessert foods in your house?

| | Never | Rarely | Sometimes | Frequently | Always |
|-------------------|-------|--------|-----------|------------|--------|
| Candy | 0 | 1 | 2 | 3 | 4 |
| Cookies | 0 | 1 | 2 | 3 | 4 |
| Cakes/Snack cakes | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| Ice Cream, Sherbet, Frozen Yogurt or Sugared Popsicles | 0 | 1 | 2 | 3 | 4 |
| Chocolate/Chocolate bars | 0 | 1 | 2 | 3 | 4 |
| Other: Specify _____ | 0 | 1 | 2 | 3 | 4 |

Eating dinner together:

1. How many days of the week do your family sit at a table and eat dinner together?
This includes when it is just you and your child(ren).

One day
or less 2 days 3 days 4 days 5 days 6 days 7 days

Prepare/plan meals together:

How often did you...

| | Never | Rarely | Sometimes | Frequently | Always |
|-----------------------------------|-------|--------|-----------|------------|--------|
| Prepare meals with your child? | 0 | 1 | 2 | 3 | 4 |
| Plan meals/menus with your child? | 0 | 1 | 2 | 3 | 4 |

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