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An Integrated Approach to Prevention of Obesity in High Risk Families

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AN INTEGRATED APPROACH TO PREVENTION OF OBESITY IN HIGH RISK FAMILIES

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AN INTEGRATED APPROACH TO PREVENTION OF OBESITY IN HIGH RISK FAMILIES

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Childhood obesity has reached epidemic levels in developed countries. In the past 30 years, overweight in children has doubled and it is now estimated that one in five children in the US is overweight (1). Identifying connections between caregiver-child interactions and key behaviors associated with resilience to overweight is viewed as an approach which can lead to interventions which may result in a reduction in overweight and obese children. While children learn eating behaviors from adults and peers (9), there are relatively few studies examining the role of the family in shaping and supporting behaviors leading to weight gain, loss, or maintenance (10). The purpose of this study was to determine if certain feeding and physical activity caregiver/child behaviors can be directly related to the incidence of overweight or obesity in low income children 4-10 years of age. Participants were 30 primary caregivers of children participating in the Nutrition Education Program (NEP) or Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Interviews were conducted with caregivers using a card-sort method containing cards with behavior suggestions about feeding children. Information from interviews was recorded and reviewed for validity by multiple researchers. Of all caregivers in the study 28% were considered “overweight”, 32% were “obese”, and 16% were “morbidly obese”. The mean BMI of children was 19.7 and 45%

had BMIs putting them *"at risk for overweight"* or *"overweight"*. The most commonly followed behaviors included *eat together as a family; eat more fruits, vegetables, and whole grain foods, and decrease intake of sweetened beverages.* Caregivers who reported "always" following ten or more behaviors had a lower average BMI (26.8) then the average BMI of those who followed nine or fewer behaviors (30.9). Although caregiver's indicated they typically followed most behaviors when asked "yes" or "no" candid statements indicated otherwise. There appears to be confusion and misunderstanding concerning key behaviors and it is necessary to educate caregiver's on their meaning so they can be followed and implemented successfully.

INTRODUCTION

Obesity is one of the largest health problems facing Americans, and childhood obesity has reached epidemic levels in developed countries. In the past 30 years, overweight in children has doubled and it is now estimated that one in five children in the US is overweight (1). Obesity occurs when caloric intake exceeds energy expenditure. Genetic predisposition does play a role in obesity along with environmental factors, lifestyle choices, and culture. Although obesity-associated morbidities occur more frequently in adults, significant consequences of obesity as well as the preceding onset of adult disease occur in obese children and adolescents (2). Some theorize that the best place to target the obesity epidemic is childhood due to the young age at which food preferences and lifestyles are shaped, the lifelong complications that childhood obesity can create, and the potential for childhood interventions to be more cost-effective (3). Families currently find themselves living in an obesigenic environment. They are faced with exposure to television advertising, large portions, frequent eating away from home, limited physical activity, and the promotion of soft drinks and other empty and low nutrient dense snacks and foods. Yet none of these behaviors alone can contribute to the overriding cause of obesity. So what makes some families resilient to obesity and others not when living in the same environment? Speakman suggests that when placed in the same environment some people develop obesity because their genetic composition makes them more likely to adopt obesity-conducive behaviors or have low resting metabolic rates that lead them into positive energy balance (4). Yet, regardless of genetic influence, some families make it through this environment without becoming overweight. Identifying connections between caregiver-child interactions and key behaviors

associated with resilience to overweight is viewed as an approach which can lead to interventions which may result in a reduction in overweight and obese children.

REVIEW OF LITERATURE

Overview of Childhood Obesity

Obesity was first declared a public health concern in 1952 (5). Since then billions of dollars have been spent to prevent and intervene with no noticeable effect. Although obesity-associated morbidities occur more frequently in adults, significant consequences of obesity occur in obese children and adolescents (2). Some of the common medical consequences of obesity that occur in adults can also be seen in children. Hyperlipidemia, hypertension, type 2 diabetes, sleep apnea and early puberty are frequent consequences among obese children. As severely overweight children and adolescents become more common, the risks of weight-related complications in adulthood will increase (2). Studies have shown that overweight children followed up for 40 (6) and 55 years (7) were more likely to have cardiovascular and digestive diseases, as compared to those who were lean.

Obesity Framework

It is obvious that both environmental and genetic factors contribute to obesity. Obesity develops when there is a mismatch between energy intake and expenditure that results from behavior (feeding behavior and time spent active) and physiology (resting metabolism and expenditure when active) (4). Instead of assuming obesity causality from either behavior or genes, they should be viewed as different levels of the same

causal framework. Two different aspects are often used to describe the obesity phenomenon: the trend in prevalence of overweight and obese people over time and the differential susceptibility of individuals to obesity (4). The second aspect of the obesity problem is the most interesting, despite living in similar environments, not everyone becomes obese. This can be traced back to both behavior and physiology. Since genetics cannot be changed attention must be focused on behavior modifications and the environment in which obesity occurs.

Caregiver-Child Interactions

It has been theorized that the best starting point for overcoming the obesity epidemic is to treat childhood obesity or prevent it from occurring. Reasons given for focusing on youth include the young age at which food preferences and lifestyles are shaped, the lifelong complications that childhood obesity can create, and the potential for childhood interventions to be more cost-effective (3). Caregivers have a major influence on children's eating behaviors. The family is a provider of food, and the family influences food attitudes, preferences, and values that affect lifetime eating habits (20). While children learn eating behaviors from adults and peers (9), there are relatively few studies examining the role of the family in shaping and supporting behaviors leading to weight gain, loss, or maintenance (10).

Obesity and the Environment

Families currently find themselves living in an obesigenic environment. They are faced with exposure to television advertising, large portions, frequent eating away from home, limited physical activity, etc. Since not all low-income children are overweight, it can be assumed that some families manage to make it through this environment without their children becoming at risk for, or overweight (regardless of genetic influences). What makes some families resilient to obesity and not others, when living in the same environment? Caregiver-child interactions and key behaviors associated with resilience to overweight may provide part of the answer. If differences among families are present, probable interventions can be designed, evaluated, and implemented.

Obesigenic Behaviors

Much has been written about which factors are associated with the development, treatment and prevention of childhood overweight (5, 8). Key behaviors identified as being associated with obesity are an increased consumption of carbonated sugary drinks and other sweetened beverages, decline in milk consumption, decline in physical activity (unlimited television viewing and computer game playing, low participation in sports, increased proportion of children driven to school), restrictive feeding practices of parents, lower intakes of fruit and vegetables, few family meals, frequent eating out, skipping breakfast, large portion sizes, high intake of energy dense, nutrient poor snack foods, and a decrease in food prices (11-15). None of these behaviors alone can be singled out to be

the overriding cause of obesity. However, they are topics targeted for interventions to decrease the prevalence of childhood overweight.

The strength of evidence of the relationship between many of these key targeted behaviors to childhood overweight was examined by a group of researchers commissioned by the American Dietetic Association (http://www.adaevidencelibrary.com/). Behavior relationships to childhood overweight were graded based on the amount of supporting research evidence. Most received a grade of III, supported by limited or weak data. A few behaviors received a grade of II, supported by evidence of fair value. None of these behaviors were given a grade of I, supported by good/strong evidence. These findings confirm the need for more research on obesity prevention behaviors.

Although there is at best only fair evidence to support these key behaviors, they are the topics that are promoted for preventing childhood overweight. There is not much documented information concerning the impact of current community interventions. Community nutrition educators and other health care professionals may already be implementing treatment and prevention strategies targeting these behaviors (8, 18). Yet, we do not know the extent to which they are being effective, if at all. The amount of time, money, and other resources being devoted to these topics; and the extent of the impact of these efforts is still unknown. The family environment needs strong community support for obesity efforts to be effective.

Increased Consumption of Fast Food and Sweetened Beverages

Science states obesity results when energy intake exceeds energy expenditure, so it is no surprise that research has shown children's consumption of soft drinks and fast food has increased over the years along with their body weight. Between 1977 and 1996 the proportion of foods children consumed from fast food establishments increased by nearly 300% and soft drink consumption increased as well (21). It is estimated that soft drinks provide consumers 188 kcal/d more than the energy intake of non-soft drink consumers (21). According to Pierre St-Onge et al., although there is no data currently available showing a causal relationship between fast food and snack consumption and body weight increases, it has been shown that as children age fast food consumption increases.

Borrud et al. compared data from the first year of the USDA's Continuing Survey of Food Intakes by Individuals (CSFII) 1994-1996 results to the 1977-78 survey results to look at changes over the 17 year span. They found that 40% of children 5 and under ate away from home at least once a day in 1994, compared to 26% in 1977-78; and two-thirds of children 6-11 years ate away from home at least once a day (25). Over the 17 years between surveys the proportion of food from fast food establishments increased by 14% and 166% for children 5 years old and under and males 6-19 years old, respectively (25). Lin et al. also reviewed the CSFII surveys and concluded that away from home meals were higher in fat, saturated fat, and sodium and lower in fiber, iron, and calcium than at home meals (26). It is important to note that cross-sectional studies have not found an association between fast food establishment use and body mass index (BMI),

and longitudinal data are not available regarding increased fast food consumption and body weight changes (21).

It has been hypothesized that soft drinks and sugary beverages have replaced the consumption of more nutritious beverages such as milk and 100% fruit juice in the diet of children and adolescents and may lead to excessive energy intake (14). However, there are few studies that have explored this relationship. Harnack et al. looked at dietary intakes of children aged 2-18 years from data collected as part of the 1994 CSFII. They found that for all age groups, energy intake was higher among those in the highest soft drink consumption category compared with non-consumers (14). It was also noted that for all age groups those in the high soft drink consumption category were more likely to consume less than 8 ounces milk and 4 ounces fruit juice per day than non-consumers (14). Nielsen et al. also looked at the CSFII surveys and concluded that sugared beverages were consumed more in the age groups of 2-18 year olds and 19-39 year olds (23).

Intake of Fruits, Vegetables and Whole Grain Foods

It is possible that an increase in the consumption of food eaten away from the home at restaurants and fast food establishments has contributed to a decreased intake of fruits, vegetables and whole grains. When compared to the U.S. Dietary Guidelines, children's intakes fall dramatically short of the recommendations. Brady et al. looked at the dietary intakes of children aged 7-14 years and compared them to the Food Guide Pyramid recommendations from 1992 (24). They found that only 5% of their sample met

daily fruit recommendations, 9% met guidelines for dairy, and discretionary fat and added sugar together accounted for 46% of the total diet (24). According to the recommendation that one-third of total vegetable servings should be dark green-deep yellow, consumption of this food group also fell well below the suggested recommendation (24). With environmental influences such as the changing nature of the food supply, increased reliance on foods consumed away from home, food advertising, marketing, and promotion, and food prices affecting eating behaviors the previous results are not unrealistic (21).

Television and Video Viewing/ Computers and Video Games

Decreasing sedentary behavior has often been evaluated as an opportunity for intervention when dealing with child overweight and obesity. Displacing time spent doing physical activity, increasing the calories consumed in a day due to advertising encouraging high-calorie food consumption, and/or decreasing resting metabolic rate are often given as reasons that television viewing contributes to obesity (27). Television interventions so far have ranged from limiting television viewing time to changing the content of commercials targeting youth. The increased use of computers and video games are also sedentary behaviors that may contribute to obesity for similar reasons.

In a study by Robinson in 1999, 192 third and fourth grade students participated in a study aimed at reducing television usage by learning 18 lessons taught by classroom teachers during the school day. The intervention also included encouragement to have a 10 day television turnoff followed by a 7 hr/wk maximum of viewing hours. At the end

of the 7 month intervention, the intervention group had significant relative decreases in BMI, waist-to-hip ratio, triceps skin fold thickness, and waist circumference compared to the control group (28). Although there were significant reductions in the amount of television viewed, the number of meals eaten in front of the television, and the amount of time spent playing video games found in this study; there were no significant increases in moderate or vigorous intensity activities found.

Taking a different avenue with television viewing interventions, Gorn and Goldberg looked at how the type of television advertisements viewed influenced snack choices of children 5-8 years old (29). Children viewed a 30 minute show containing 4.5 minutes of commercials revolving around 1 of 4 groups: candy; fruit, yogurt, and orange juice; public service announcements about eating a balanced diet and watching sugar intake; or the control with no commercials. After viewing the programs children were allowed to choose their snack for the day from a variety of sweets and fruits. Those who watched the candy commercials choose significantly fewer fruits than those children in all other groups. They also choose orange juice over Kool Aid the least of all groups.

The effects of television viewing on child obesity involve even younger kids aged 2-4 years. Dennison et al. fond in their study examining television viewing and preschool aged kids that 57% of the 4 year old children in their study exceeded the recommended maximum media viewing time of 2 hours per day given by the American Academy of Pediatrics (30-31).

Food Brought into the Home/ Restrictive Feeding Practices

There is a fair amount of evidence supporting the relationship between restrictive feeding practices of parents' and child overweight. The ADA Evidence Analysis Library looked at 10 studies that examined this relationship and concluded that restrictive feeding practices of parents' may promote consumption of forbidden foods leading to overeating and caloric imbalance (15). The fact that most studies were conducted using non-Hispanic, white girls is a limitation of the research since these findings may only be applicable to this population.

Research conducted by Fisher and Birch found that restricting access to foods high in fat and sugar increased children's preference for and intake of that food (16). More recent research by Fisher and Birch also found that parents' restriction of snack foods predicted girls aged 4.6 to 6.4 years snack food intake and negative self-evaluation of eating (11).

Family Meals

The family plays an important role in developing children's beliefs and perceptions about food and eating behaviors which, down the road could impact their weight. Research shows that family meals play an important role in the quality of children's diets (33, 34). A greater frequency of family meals is associated with increased intake of fruits, vegetables, grains, and calcium-rich foods and a lower intake of fried foods and soft drinks (33).

Gable et al. looked at school-aged children ranging from kindergarten to third grade to identify eating and activity factors associated with the onset of overweight and persistent overweight (35). They found that children who watched more television and ate fewer family meals during kindergarten and first grade were more likely to be overweight in the spring of third grade (35). The care-giver role in developing children's eating patterns and behaviors is important as they are primarily purchasing and preparing foods and creating opportunities for activity and sedentary behaviors.

Skipping Breakfast

Over the years there have been studies done to determine if skipping breakfast is associated with weight. It was shown that from 1965 to 1991 breakfast consumption declined in a nationally represented sample of US adolescents aged 1-10 years (36). The decline in breakfast consumption is a concern since eating breakfast has been associated with higher overall diet quality (37). A study by Berkey et al. investigated whether skipping breakfast was associated with changes in body fatness (38). They found that at baseline children who never ate breakfast were heavier than those who ate breakfast nearly every day. BMI change analysis over 3 years suggested that normal weight girls who ate breakfast only 1-2 days/week gained more weight than peers who ate daily. However, overweight boys and girls who skipped breakfast gained less weight than daily eaters (38).

Large Portion Sizes

It has been predicted that an increase in portions sizes in the United States has contributed to child overweight and obesity. In a study by Nielsen et al. trends in food portion sizes consumed in the United States were explored (32). Portion sizes and energy intake of common foods such as salty snacks, desserts, soft drinks, fruit drinks, French fries, hamburgers, cheeseburgers, pizza, and Mexican food were examined. It was found that between 1977 and 1996 portion sizes and energy intake increased for all food groups except pizza. The greatest energy intake and portion size increases were seen in salty snacks which increased from 132 to 225 kcal (1.0 to 1.6 oz), soft drink consumption which increased from 144 to 193 kcal (13.1 to 19.9 fl oz), and cheeseburger intake from 397 to 533 kcal (5.8 to 7.3 oz) (32). Between 1994 and 1998 the largest portion sizes for most foods including salty snacks, soft drinks, fruit drinks, French fries, and Mexican food were found at fast food establishments. However, the largest portion sizes for desserts, hamburgers, and cheeseburgers were found at home. Therefore, portion sizes were found to have increased both inside and outside of the home.

Energy Dense, Nutrient Poor Snack Foods

Although a causal relationship between increased snacking and childhood overweight cannot be assumed it is not unrealistic to think that snack food and soft drink consumption may play a role. Several studies have looked at the increased snacking pattern of children over time. Jahns et al. found that the number of snacking occasions by children (foods consumed within a 15-minute period separate from the meal) increased

by 24-32% from 1977 to 1996 in children aged 2-5, 6-11, and 12-18 years (22). Nielsen et al. also found that from 1977 to 1996 consumption of salty snacks, soft drinks, and pizza increased between 132% and 143% among 2-18 year olds. These food/beverage items contributed to the largest increase in energy consumption among this age group (23). Of these foods the largest increase was seen in salty snacks which increased from 6.3% to 12.3% over 20 years (23).

Logic Model

In an effort to capture the impact of community interventions the Logic Model can be used as a practical method for systematically collecting impact data (17). The Community Nutrition Education Logic Model (CNE Logic Model), a model for nutrition education that illustrates relationships of model components to the health and independence of participants was developed using the original Logic Model as a guide. The use of this model allows for flexibility across multiple nutrition education programs. The goal of the CNE Logic Model is to guide the development and evaluation of nutrition education programs that help people learn how to make healthful food choices consistent with the Dietary Guidelines for Americans and the MyPyramid (17). The application of this model should allow for better documentation of the nutrition education process and could detect the cumulative impact of programming for the first time. This model can be modified for developing and evaluating interventions to prevent childhood obesity in low income families.

Card-Sort Method

Food and activity preferences and behaviors have been assessed using a wide variety of methodologies. Dietary assessment tools include 24-hour recalls, diet records, and food frequency measures (39). Food preferences and behaviors are typically measured using questionnaires or pictures of food (40). A picture-sort can be used by presenting food/drink items as pictures on cards and having respondents sort the cards based on preference and/or consumption (41). Advantages of the picture-sort method include brief administration time, reduced literacy demands, and an engaging process (41).

Future Research

It is certain that more research is essential to address the growing obesity problem in children and adults. The 2004 Strategic Plan for NIH Obesity Research (18) lists four broad themes for NIH obesity research including preventing and treating obesity through lifestyle modification; preventing and treating obesity through pharmacologic, surgical, or other medical approaches; breaking the link between obesity and its associated health conditions; and cross-cutting research topics including focusing on the needs of specific populations, including children, racial/ethnic minorities, persons living in conditions of lower socioeconomic status, women, older adults, and those with disabilities. The 2005 Dietary Guidelines Committee (19) recommended 17 areas related to obesity that require research. These areas range from investigating the relationship between added sugar

intake and obesity to determining how the dietary macronutrient ratio affects management of body weight and nutrient adequacy.

In order for the impacts of community nutrition education interventions involving childhood obesity to be measured, it is necessary to know what changes individuals and families might be able and willing to consider, what is currently being done by practitioners, and what tools practitioners need to successfully accomplish these interventions.

Since the obesity epidemic is still on the rise it is obvious that past attempts at prevention and intervention have been unsuccessful. It is still unclear why low income and minority populations are especially vulnerable to obesity, indicated by the need for further research in these areas. Obesity is not caused by a single behavior; rather it involves complex interactions between behavior and physiology.

Hypothesis

Certain feeding and physical activity caregiver/child behaviors can be directly related to the incidence of overweight or obesity in at risk children 4-10 years of age.

Objectives

1) To determine with caregivers of low income children ages 4-10 years old the awareness, meaning, use, reason for using or not using, and belief in the connection with childhood overweight and common health messages.
2) To determine if there is a connection between the use of these messages and self-reported weights for caregivers and their children.
3) To pilot test the card-sort procedure interview method with low income primary caregivers, to determine its usefulness to assess caregiver-child interactions of children at risk for overweight or obesity aged 4-10 years old.

METHODS

Subjects

Subjects were recruited from the Special Supplemental Nutrition Program for Women, infants, and Children (WIC) in Lancaster County and in cooperation with Douglas County Extension with contact Carrie Schneider-Miller who provided names of Nutrition Education Program (NEP) and WIC clients who volunteered to participate in the study. A majority of subjects were new enrollees in the NEP and WIC programs and varied in their amount of nutrition education exposure. Subjects were contacted by phone to set up an interview time and location. The self-selected participants for this study were 30 primary caregivers of children aged 4-10 years old. After approval from the Institutional Review Board at the University of Nebraska-Lincoln, data collection began. Participants were mailed a $20 stipend after the interview was completed.

Data Collection

Before data collection began, caregivers signed an informed parental consent form and were given an additional form to keep for their records (Appendix A). Fourty five minute to one hour interviews were conducted at a previously determined location by a trained interviewer who followed a written script (Appendix B). Interviews were recorded using either a tape recorder or digital voice recorder.

Caregivers were given thirteen laminated cards previously developed as part of multi-state project W1005 in Nevada with suggestions that nutrition professionals give to parents about feeding their children (Appendix C). Suggestions included: tell children to

eat all of the meal before getting dessert, allow children to eat all foods brought into the home, eat together as a family, watch portion sizes, choose healthful foods when eating out, eat less foods with empty calories, watch less TV and videos, eat breakfast every day, eat more fruits, vegetables, and whole grain foods, eat out less often, decrease intake of sweetened beverages, make wise snacking choices, and spend less time with computers and video games.

Sort #1 Familiar and Unfamiliar

Caregivers were asked to sort through the cards and divide them into two piles: those they had heard about (familiar) and those they had not heard about (unfamiliar). Responses were recorded on recording sheet #1 (Appendix D).

Sort #2 Always, Sometimes, or Never Follow

Suggestions caregivers had heard about (familiar) were then divided again into piles of those they always, sometimes, or never follow. Responses were again recorded on recording sheet #1. For suggestions that were always followed caregivers were asked to explain what made them decide to do this suggestion and why it was a priority for them. Responses were recorded on recording sheet #2 (Appendix E). For suggestions that were sometimes followed caregivers were asked when they followed them and why and how they were followed. Caregivers were then asked to explain why they never followed the remaining suggestions. Both sometimes and never followed suggestion responses were recorded on recording sheet #2. Caregivers were then asked what they thought

about the suggestions they had never heard of and responses were recorded on recording sheet #2.

Sort #3 Easy or Hard for Another Family

Caregivers then sorted through the cards again and indicated whether they thought the suggestion on the card would be easy or hard for another family to do and why. Responses were recorded on recording sheets #1 and #2.

Sort #4 Help Keep a Child from Becoming Overweight

Caregivers sorted the cards a final time indicating if they thought the suggestion would help keep a child from becoming overweight and why. Responses were recorded on recording sheets #1 and #2. Caregivers then went through each suggestion card and indicated what they thought the underlined words on each card meant. Responses were recorded on recording sheet #3 (Appendix F).

Demographic Characteristics

Caregivers were shown pictures of women and children of different race and sizes and asked to indicated which one best corresponds to their body and their child or children's bodies (Appendix G). Caregiver gender, age, ethnicity, race, employment status, educational level, self-reported height and weight, and child age, gender, height, and weight were also collected (Appendix H).

Qualitative Analysis

Each audio recorded interview was transcribed verbatim by a project assistant totaling 226 transcribed pages. Three graduate assistant researchers with experience working in the field of nutrition independently reviewed transcripts of the interviews to identify common themes for each behavior suggestion. Findings were then compared to look for similarities. Validity of the results was established by using triangulation, described by JW Creswell as a systematic process where researchers sort through data to identify common themes and eliminate overlapping areas (42).

RESULTS/DISCUSSION

Demographics of Caregivers

Table 1 provides demographics of all caregivers. There were a total of 30 caregivers who participated in the interviews; all were mothers except for one father. Of the 30 caregivers, 11 were African American, 15 were white or Caucasian, 3 were Hispanic or Latino and 1 was black Indian. The mean age of caregivers was 24.8 years, with a range of 19 to 43 years. On average, 1.7 children aged 4-10 years lived with the caregivers with a range of one to six children. However, this number is not representative of all children who may have been living with caregivers at the time interviews were completed.

The most common level of education achieved by caregivers was *some college or technical school* (50%), followed by *receiving a high school diploma or GED* (40%). Only two caregivers (6.7%) had completed a *4-year degree or more* and one caregiver (3.3%) had *not completed high school.* Parental education level has been shown to be related to obesity in childhood. In a study conducted by Lamerz et al. involving six-year-old children and their parents, a significant relationship was seen between parents' years of education and childhood obesity (43). Specifically, children of parents with nine or fewer years of education had a three-fold higher risk of being obese then children of parents with 13 years of education. In the current study, only one caregiver reported *not completing high school* while 40% of caregivers had *received a high school diploma or GED* as their highest level of education.

Table 1. Caregiver demographics.		
	n	Percent
Sex		
Female	29	96.7%
Male	1	3.3%
Race		
American Indian or Alaska Native	0	0.0%
Asian or Asian American	0	0.0%
Black or African American	11	36.7%
White or Caucasian	15	50.0%
Hispanic or Latino	3	10.0%
Other (Black/Native American)	1	3.3%
Education Level		
Have Not Completed High School	1	3.3%
Received High School Diploma or GED	12	40.0%
Some College or Technical School	15	50.0%
4-Year Degree or More	2	6.7%
Employment Status		
Homemaker	9	30.0%
Not Employed	3	10.0%
Employed Part Time	9	30.0%
Employed Full Time	7	23.3%
Disabled	1	3.3%
Employed Part Time and Full Time	1	3.3%

Current employment, either part or full time, was indicated by approximately 57% of caregivers. Specifically, employment status responses included 9 homemakers, 3 caregivers who were not employed, 9 employed part time, 7 employed full time, 1 disabled, and 1 employed part and full time. Body figure perceptions of caregivers were measured using a progression of seven silhouette images with image one being the thinnest and image seven being the heaviest. The average silhouette image was 3.7 with a

range of 2 to 6.5. There were three caregivers who did not specify a silhouette image and no silhouette was chosen by the father as the images were only of women figures.

Demographics of Children

Children of caregivers participating in the study were between the ages of four and ten years old. Child gender was closely split with 16 males and 17 females. There were also 21 additional children who fell outside the age parameters, with 20 children younger than four and one child older than ten years. Of the 33 children 17 (52%) lived with caregivers of black or African American race, 13 (39%) lived with caregivers of white or Caucasian race, one child lived with Hispanic or Latino caregivers, and two children lived with black/Native American caregivers. Specific race of children was not reported during the interviews.

Subjects Body Mass Index (BMI)

Caregivers

Caregiver's self-reported height and weight was converted to BMI to determine what category they fell in to (Table 2). The average BMI for caregivers was 30.1 with a range of 19 to 55. The BMI for two caregivers was not able to be calculated due to missing height and/or weight information. Three caregivers were pregnant during the time information was collected and their BMI was not included since it would be an inaccurate comparison of BMI's.

The National Center for Health Statistics (NCHS) CDC annual report shows significant differences between race/ethnic group obesity rates in U.S. women. According to this report, non-Hispanic black and Mexican-American women were more likely to be obese when compared to non-Hispanic white women in all age groups (20-39y, 40-59y, 60y and over) (44). In the present study the mean BMI for black/African American caregivers was 31.6 classified as "obese". One black/African American caregiver (10%) was of "normal" weight classification, three (30%) were "overweight", four (40%) were "obese", and two (20%) were classified as morbidly obese with BMI's greater than 40. The BMI of two black/African American caregivers were not included in the data due to pregnancy weights provided. The mean BMI for white/Caucasian caregivers was 30.1 classified as "obese". Five white/Caucasian caregivers (45.4%) were of "normal" weight classification, two (18.2%) were "overweight", two (18.2%) were "obese", and two (18.2%) were morbidly obese. The BMI of four white/Caucasian caregivers were not included in the data due to a missing weight, one caregiver was a father, and two caregivers were pregnant. In summary, the values of the current study indicate that seven (28%) caregivers in the study were considered "overweight", eight (32%) were "obese", and four (16%) were "morbidly obese". Having overweight parents is one of the greatest risk factors for a child becoming obese (45, 46).

Table 2. BMI of caregivers and child participants.		
BMI of Caregivers		
	N=25[a]	Percent
Classification		
< 18.5 Underweight	0	0.0%
18.5-24.9 Normal	6	24.0%
25-29.9 Overweight	7	28.0%
30-39.9 Obesity	8	32.0%
≥ 40 Morbid obesity	4	16.0%
BMI		**Mean**
		30.1
BMI of Child Participants		
	N=20[b]	Percent
BMI Percentiles		
BMI < 85th percentile	11	55.0%
BMI ≥ 85th percentile < 95th percentile	2	10.0%
BMI ≥ 95th percentile	7	35.0%
BMI		**Mean**
		19.7
[a]only 25 of the 30 BMIs were available for caregivers [b]only 20 of the 33 BMIs were available for children		

Children

Children's BMIs were calculated using the reported height and weight given by each caregiver. The mean BMI of children between the ages of 4-10 years was 19.7, with a range of 11 to 35 (Table 2). Only 20 of the 33 children's BMIs were available due to missing heights and weights that were not reported by caregivers. When comparing these BMIs to the CDC Growth Charts (47), approximately 10% (2 children) of children were *"at risk for overweight"* (BMI ≥ 85th percentile but less than the 95th percentile) and 35%

(7 children) were *"overweight"* (BMI ≥ 95th percentile). When combining these percentages almost half (45%) of the children had BMIs putting them *"at risk for overweight"* or *"overweight"*.

Familiar and Unfamiliar Behaviors

Caregivers were shown 13 laminated cards with different behaviors on them and asked to sort them based on those they were familiar with and unfamiliar with (Table 3). At least seventy five percent of caregivers were familiar with ten out of the thirteen behaviors including *decrease intake of sweetened beverages, watch portion sizes, eat out less often, make wise snacking choices, eat breakfast every day, eat more fruits, vegetables, and whole grain foods, choose healthful foods when eating out, eat together as a family, spend less time with computers and video games, and watch less TV and videos.*

All 30 caregivers (100%) were familiar with four of the behaviors which included *make wise snacking choices; eat more fruits, vegetables, and whole grain foods; eat together as a family; and watch less TV and videos*. Only 66% of caregivers were familiar with *eat less foods with empty calories* and when asked the meaning of empty calories many responses were incorrect such as "foods with less calories", "foods with zero calories", and "diet type foods, those with ½ the fat". The behavior most unfamiliar to caregivers was *allow children to eat all foods brought into the home*, with only 50% of caregivers familiar with this behavior which was referring to restrictive feeding practices

of parent's. Restrictive feeding practices of parents' may promote consumption of forbidden foods leading to overeating and caloric imbalance (15).

Table 3. Behavior's familiar and unfamiliar to caregivers.

	Familiar		Unfamiliar	
	n	Percent	n	Percent
Behavior				
Decrease intake of sweetened beverages	29	97.0%	1	3.0%
Watch portion sizes	26	87.0%	4	13.0%
Eat out less often[a]	26	90.0%	3	10.0%
Make wise snacking choices	30	100.0%	0	0.0%
Eat breakfast everyday	28	93.0%	2	7.0%
Eat less empty calorie foods[b]	19	66.0%	10	34.0%
Eat more fruits, vegetables and whole grain foods	30	100.0%	0	0.0%
Allow children to eat all foods brought into the home	15	50.0%	15	50.0%
Choose healthful foods when eating out	27	90.0%	3	10.0%
Tell children to eat all of the meal before getting dessert	22	73.0%	8	27.0%
Eat together as a family	30	100.0%	0	0.0%
Spend less time with computers and video games	26	87.0%	4	13.0%
Watch less TV and videos	30	100.0%	0	0.0%

[a]Only 29 out of 30 responses were available
[b]Only 29 out of 30 responses were available

Perceived Behavior Meanings

Caregiver's were asked to interpret the meaning of underlined words or phrases for 9 out of the 13 behaviors (Table 4). Responses given were interpretations of words and phrases not necessarily practices or behaviors currently being followed by the caregiver. As mentioned earlier *make wise snacking choices and watch less TV and videos* were two of the behaviors most familiar to caregivers (Table 3). This knowledge correlates with the interpretations given for "wise" (make wise snacking choices) and

"videos" (watch less TV and videos). Recurring interpretations for *make wise snacking choices* included "smart, healthy, and fruits and vegetables". "Violent content and lack of exercise or motivation" were common responses for *watch less TV and videos*. Similar responses were also given for *spend less time with computers and video games.* As discussed earlier just over half (66%) of caregiver's were familiar with *eat less foods with empty calories* (Table 3). This is evident by the conflicting interpretations for *eat less foods with empty calories* which include "junk and sweets" as well as "zero calories, water, and carrots/celery". It is apparent that there is confusion and misunderstanding concerning this behavior and it is necessary to educate caregivers on its meaning so it can be followed and implemented successfully.

Table 4. Caregiver responses to meanings of underlined words or phrases.	
Behavior	**Meaning of Underlined Words or Phrases**
Decrease intake of **sweetened** beverages	fat, not good for you, cavities, limit, bad, **candy**, **sugar**, **soda**, diabetes, overweight, energy
Watch potion sizes	calculate, keep track, **know**, monitor, observe, aware, don't over eat, look out, how much, fist size foods
Make **wise** snacking choices	**smart**, **healthy**, **f & v**, cheese, homemade cookies, think, best
Eat less **foods with empty calories**	less calories, **junk**, **sweets**, unhealthy, **zero calories**, no nutrition, diet food w/ 1/2 fat, water, carrots/celery
Allow children to eat all foods brought into the home	**healthy stuff**, variety, **eat whatever**, watch what comes in, clean plate, separate kid from adult food
Choose healthful foods when eating out	decisions, small portions, **healthy**, low calorie, salad/veggies, be aware, less fat/sodium/sugar
Tell children to eat all of the meal before getting dessert	decision, portions, **clean plate**, low cal/high nutrient, all food groups, don't need to clean plate, bribing
Spend less time with computers and **video games**	**violent**/edu. games, **lack of exercise,** fun, waste money, privilege, no video games, ruin eyes, gaming system
Watch less TV and **videos**	**violent**/educational, **lack of exercise/motivation**, movies/cartoons/DVD's
*bold words under meaning indicate recurring responses	

Behaviors Thought to Keep a Child from Becoming Overweight

Caregivers were asked if they thought each individual behavior would help keep a child from becoming overweight if it were followed, response choices included “yes”, “no”, and “unsure” (Table 5). A majority of caregivers (>50%) felt that 12 out of the 13 behaviors, if followed would help keep a child from becoming overweight. The greatest number of “yes” responses was seen for *decrease intake of sweetened beverages* (93.3%),

eat more fruits, vegetables and whole grain foods (96.7%)*, make wise snacking choices* (93.3%)*, and choose healthful foods when eating out* (93.3%). All of these behaviors were also "familiar" to at least 90% of caregiver's (Table 3). Galloway et al., found that when mothers consumed more fruits and vegetables they did not pressure their daughters to eat and their daughters were less picky and consumed more fruits and vegetables (48). Another study found that when African-American parents model healthy eating behaviors it may increase the consumption of fruits and vegetables by children (49). Although eating behaviors of caregivers and their influence on children living in the home were not closely examined in this study future research in this area would be beneficial.

Eat together as a family and tell children to eat all of the meal before getting dessert were two behaviors with mixed results. Eighteen caregiver's (60%) reported that *tell children to eat all of the meal before getting desert* would help keep a child from becoming overweight, while 7 (23.3%) did not think it would, and 5 (16.7%) were unsure. Restrictive feeding practices have been shown to increase a child's preference for forbidden foods and encourage overconsumption when these forbidden foods are made readily available (16). The use of restrictive feeding practices may negatively influence the child's weight status as it promotes overeating and ignoring internal cues of hunger (45). Researchers have found that the relationship a person has with food as a young adult reflects back to parental influences when they were a child (50). Young adults were more likely to stop eating when they were full if they were allowed to as children, and those that were forced to clean their plate were more likely to clean their plate at the time of the survey. The average BMI of those who were sometimes forced to clean their plate was

significantly higher than those who were rarely forced to do so (50). When caregiver's were asked why they would follow this behavior responses included "that's a must it's the rule", "that's how I was taught", and "no eat no treat".

Similar responses were seen for *eat together as a family* with 17 (56.7%) caregiver's stating it would help keep a child from becoming fat, 7 (23.3%) stating it would not, and 6 (20%) were unsure. Studies have shown that eating a family dinner together is associated with greater intakes of foods such as fruits and vegetables and when adults model consumption of these foods it may impact the children's intakes (51, 52). When asked why *eating together as a family* would not keep a child from becoming overweight one caregiver stated " that doesn't have anything to with them being obese, eating together builds family bonds, it doesn't have anything to do with obesity".

Although a majority of caregiver's indicated *spend less time with computers and video games and watch less TV and videos* would help keep a child from becoming fat, 20% (spend less time with computers and video games) and 13% (watch less TV and videos) of caregiver's indicated "no" or "unsure". When asked why they responded this way caregiver statement's included "No, cause what does it have to do with…unless like they're eating or something" and "I don't think you can gain weight by watching TV and playing video games". Results from a study by Diets et al. found that children aged 6-11 years who watched more television experienced a greater prevalence of obesity than children watching less television (13).

The behavior causing the most confusion was *allow children to eat all foods brought into the home*. As mentioned earlier this behavior was also the most unfamiliar to

caregiver's. Seventeen caregiver's (56.7%) stated that this behavior would not keep a child from becoming fat, while eight caregiver's (26.7%) were unsure, and only 5 (16.7%) caregiver's thought it would help. However, since 50% of caregiver's were unfamiliar with this behavior it is possible they didn't understand how to relate the question to the behavior.

Table 5. Behaviors thought by caregivers to keep a child from becoming overweight.

	Yes n (%)	No n (%)	Unsure n (%)
Behavior			
Tell children to eat all of the meal before getting dessert	18 (60.0)	7 (23.3)	5 (16.7)
Allow children to eat all foods brought into the home	5 (16.7)	17 (56.7)	8 (26.7)
Eat together as a family	17 (56.7)	7 (23.3)	6 (20.0)
Eat less foods with empty calories[a]	26 (92.9)	1 (3.6)	1 (3.6)
Eat out less often[b]	25 (86.2)	2 (6.9)	2 (6.9)
Decrease intake of sweetened beverages	28 (93.3)	1 (3.3)	1 (3.3)
Eat more fruits, vegetables, and whole grain foods	29 (96.7)	1 (3.3)	0 (0.0)
Eat breakfast everyday	23 (76.7)	1 (3.3)	6 (20.0)
Make wise snacking choices	28 (93.3)	1 (3.3)	1 (3.3)
Spend less time with computers and video games	24 (80.0)	3 (10.0)	3 (10.0)
Watch less TV and videos	26 (86.7)	3 (10.0)	1 (3.3)
Choose healthful foods when eating out	28 (93.3)	1 (3.3)	1 (3.3)
Watch portion sizes[c]	27 (93.1)	1 (3.4)	1 (3.4)

[a]Only 28 out of 30 responses were available
[b]Only 29 out of 30 responses were available
[c]Only 29 out of 30 responses were available

Themes

In order to establish internal validity with the qualitative results of this study, the data were reviewed by two additional researchers who were graduate students in the Department of Nutrition and Health Science at the University of Nebraska-Lincoln. Of the 13 behaviors evaluated in this study 9 were reviewed by additional researchers to identify major themes. Major themes found by the additional researchers were then compared to the original major themes that were identified (Table 6). The behaviors reviewed included *tell children to eat all the meal before getting dessert, allow children to eat all foods brought into the home, eat less foods with empty calories, decrease intake of sweetened beverages, make wise snacking choices, spend less time with computers and video games, watch less TV and videos, choose healthful foods when eating out, and watch portion sizes.* Behaviors not included were *eat together as a family, eat out less often, eat more fruits, vegetables, and whole grain foods, and eat breakfast every day*.

Table 6. Comparison of major themes derived from common messages delivered to mothers of children at risk for overweight or obesity.		
BEHAVIORS	**THEMES**	
	Original Researcher Themes Identified	**Additional Researcher Themes Identified**
Tell children to eat all the meal before getting dessert	Always get dessert Family history Clean plate Healthy food first	Clean plate Hunger/Satiety cues Bribe/Reward
Allow children to eat all foods brought into the home	Bring home healthy foods Off limit foods Unfamiliar Eat whatever	Parental control No limits/boundaries Healthy options
Eat together as a family	Family history Communication Just do it Unity	
Eat less foods with empty calories	Didn't understand Health complications Junk Sweets Zero calories	Junk food Low/No calorie No nutrition Don't know specific foods
Eat out less often	Cost	
Decrease intake of sweetened beverages	Don't purchase Health complications Misconceptions Candy, sugar, soda	Sugar Specific beverages Unhealthy Sugar and fat
Eat more fruits, vegetables, and whole grain foods	Nutrition High consumption	
Eat breakfast everyday	Most important meal Energizes Affects mood	
Make wise snacking choices	Fruits and vegetables Smart Healthy	Healthy choices Think/decision making Smart
Spend less time with computers and video games	Don't own Violent Lack of exercise	Violent Inactivity Negative Parental control
Watch less TV and videos	Inactivity Violent	Inactivity/laziness Movies/cartoons Family time
Choose healthful foods when eating out	Menu influence	Selecting fruits and vegetables
Watch portion sizes	Self regulation Avoid large portions Know	Observe amount Parental/portion control Awareness of type of food

Tell children to eat all the meal before getting dessert

When comparing themes identified with *tell children to eat all the meal before getting dessert* a common theme found was "clean plate". Since it has been shown that restrictive feeding practices may lead to overeating and an inability to identify feelings of fullness it is concerning that many caregivers are requiring children to clean their plates before getting dessert which is likely something they desire. It is then possible to infer that if a meal is not finished and the child doesn't get dessert they will then develop a preference for that dessert (forbidden food) and overeat it in the future. Since it has also been shown that requiring children to clean their plate can lead to an inability to recognize hunger cues and therefore overeat, it is interesting that 60% of caregiver's thought it would keep a child from becoming overweight (Table 5) corresponding with the dominant theme "clean plate" seen throughout caregiver interviews.

Allow children to eat all foods brought into the home

Two common themes were found among researchers for *allow children to eat all foods brought into the home*. Both groups identified "bringing home healthy options" and having "no limits/boundaries" as major themes. Statements from subjects regarding bringing home healthy options included "I would only bring foods that are healthy", "I try to cook healthy and not to bring in much sweets", "I figure if I don't want my daughter to have pop and candy, I can't bring it home". Statements regarding no limits/boundaries included "It gets her used to all kinds of food, I don't want her to be a picky eater", "We like to offer many different types of food, ethnic foods, flavors,

spices", and "I monitor it more with my younger kids under 4 years, the older kids get their own snacks so if I have Little Debbies or chips they might choose that over healthier foods". This last response is similar to one study that found parental monitoring and control over the child's food choices increased the nutritional value of meals. When the child had independence to choose foods they were often unhealthy choices (53). This behavior also looks at restrictive feeding practices of caregiver's. Results reveal conflicting practices as 56.7% of caregiver's did not think following this behavior would keep a child from becoming overweight (Table 5). One of the dominant themes indicate many caregiver's are letting their children eat whatever comes into the home (not being concerned this behavior will lead to overweight) and the other theme implies many are only bringing in healthy foods (concern for what their child is eating). Themes identified from both review groups that were not similar included parental control, off limit foods, and being unfamiliar with the behavior.

Eat less foods with empty calories

Researchers found multiple similarities among themes for *eat less foods with empty calories* including "junk food", "low/no/zero calorie foods", and "not understanding". Since "low/no/zero calorie foods" is an incorrect response it could be combined with "not understanding", indicating that lack of education and knowledge may be contributing to obesity conducive behaviors. Although a large number of caregiver's did not understand the meaning of foods with empty calories 93% felt that following this behavior would help keep a child from becoming overweight (Table 5). These results may indicate that even though caregiver's can state what behaviors should be followed or

implemented they do not know or understand how to apply them. Although it was not a dominant theme some caregiver's indicated eating foods with empty calories contributed to health complications including diabetes, cavities, and overall health. All caregiver's who mentioned health concerns where black or African American. According to the American Diabetes Association and the National Institutes of Health, African Americans are disproportionately affected by diabetes compared to the general population (54, 55). Other caregivers indicated that the healthier more nutritious foods were too expensive.

Decrease intake of sweetened beverages

A common theme found by researchers for this behavior was "specific beverages/candy/sugar". Subjects listed drinks such as pop, juice, Gatorade, and Kool-aid as beverages they considered sweetened. However, there were some misconceptions regarding sweetened beverages as some subjects listed Kool-aid as a beverage that is good for you. It should be noted that no description of how the Kool-aid was made was given. The American Academy of Pediatrics (AAP) recommends that young children consume 4 to 6 ounces maximum of fruit juice because of the risk of diarrhea, over/undernutrition, and development of dental caries (56). In the present study three caregiver's stated cavities as a reason they decrease intake of sweetened beverages. A majority of caregiver's (97%) were familiar with this behavior and when asked how often they followed it 18 caregiver's stated "always", 10 stated "sometimes", and 1 stated "never". Only one caregiver did not respond as they were unfamiliar with the behavior. When describing how they "decrease intake" of sweetened beverages responses included "we only drink sweet beverages earlier in the day", "they don't like pop and drink a

limited amount of juice and Kool-aid", "we go months without soda and then we'll have months with it, summer is worse", "they get 100% juice and no pop", "we're trying to cut down but it's hard", and "limit intake of pop because it causes you to retain fat". One caregiver stated honestly that "when WIC runs out it's more economical to buy Kool-aid than milk". Although many caregivers felt they were decreasing their intake of sweetened beverages they were still being consumed on a daily basis.

Make wise snacking choices

Both review groups found that "smart and healthy choices" was a common theme for caregiver's regarding *make wise snacking choices*. This theme corresponds with the finding that 100% of caregiver's were familiar with this theme (Table 3). Along those same lines, 28 (93.3%) caregiver's felt following this behavior would help keep a child from becoming overweight (Table 5). Of the two remaining caregiver's one did not think this behavior was related to obesity and the other was unsure. It is interesting to note that the caregiver who did not think this behavior was related to obesity stated they did not feel any of the behaviors discussed would help keep a child from becoming overweight. She reported "her mother was overweight and diabetic, you can watch diets of your kids but they will seek food if they want it". The caregiver who stated they were unsure commented that no matter what you're snacking on it depends on how much of it you're eating.

Although many caregivers indicated needing or wanting to make "smart and healthy choices" was an appropriate response to this behavior, many made statements

that would indicate they don't always follow their own advice. Caregiver statements included "I buy fruits and vegetables but they don't get eaten", "I give rice cakes but with caramel and popcorn but with butter", "just give what she likes fruit snacks, chips, and cheese", and "reward kids with ice cream and junk food". Use of food as a reward for good behavior or performance may enhance the child's preference for that particular food. Birch et al. found that over 60% of mother's in their study used food, such as sweets, as means to calm, reward or punish their children (57).

Spend less time with computers and video games

The two themes found by researchers for *spend less time with computers and video games* were "time limit/parental control" and "lack of exercise/inactivity". The theme "time limit/parental control" is referring to monitoring of time spent on computers and playing video games, " lack of exercise/inactivity" is referring to the lack of energy expended while doing these activities. Although these themes were commonly referred to not all caregiver's responded this way. Almost half (40%) of the caregivers stated they did not own a computer, which may be reflective of a lower income population. Not owning a computer does not eliminate owning another form of gaming system.

A majority of caregivers (80%) did feel that this behavior would help keep a child from becoming overweight (Table 5) yet, six caregivers (20%) said they *never* follow this behavior and six said they only *sometimes* follow this behavior (Table 7). Mendoza et al. found that among children 2-5 years of age computer use > 0 hours/day was associated with higher skinfold thickness (58). As previously mentioned these responses are

demonstrating that caregivers are aware of what behaviors would be healthy and beneficial to their lifestyle and overall health yet they are not applying them to their own lives and families.

Watch less TV and videos

Similar to the previous behavior, the common theme for *watch less TV and videos* was "inactivity/laziness", meaning that the act of watching TV and videos promotes inactivity and laziness. Similar to the previous results, 26 caregiver's (86.7%) felt this behavior would help keep a child from becoming overweight (Table 5), yet 3 caregiver's (10%) said they never follow this behavior and 17 (56.7%) said they *sometimes* follow it (Table 7). Caregiver responses included "the TV stays on all day but we don't watch a lot of it", "we watch a lot of TV", "don't watch TV unless she's eatin", "my son watches a lot after school when I'm not there", it's what we do as a family" and "put videos in for the younger kids while I'm homeschooling the older kids". In their same study, Mendoza et al. found that watching > 2 hours/day of TV/videos was associated with being overweight or at risk for overweight and with higher skinfold thicknesses (58). Again, although a majority of caregivers feel following this behavior would be beneficial to their children, most of them (66.7%) are not routinely following it.

Choose healthful foods when eating out

There were no common themes found among review groups for *choose healthful foods when eating out*. The themes identified included "menu influence" (what the menu has to offer at each restaurant) and "selecting fruits and vegetables". Ninty percent of caregiver's were familiar with this behavior (Table 3) and 93.3% felt this behavior would

help keep a child from becoming overweight (Table 5). However, many responses indicated that caregiver's are not following this behavior, such as "when we eat out it's quick and fast", "usually we go out for chicken nuggets and fries", "we go to Applebee's and have hamburgers and fries", "I work at Taco Bell", "there aren't a lot of places with healthy choices", "work at a pizza place, it's hard to stay away", and "usually in a hurry so don't think about it". One caregiver indicated that this was a behavior that they never followed, stating "eating is for fun, I do it whenever I want". Six caregivers indicated this is a behavior they always follow. Some responses included "eat healthy food to prevent heart disease", "eat healthier to be an example for kids", and "I've talked with a nutritionist". Since caregivers in this study were participating in programs such as WIC which provides education and nutrition counseling it is possible that some caregivers responded to behavior questions based on what they remembered their nutrition professional telling them.

Watch portion sizes

Common themes identified for *watch portion sizes* included "know/awareness of type of food" and "avoid large portions/parental control". Both of these themes focus on caregiver involvement with meals and snacks. It should be considered that there is a fine line between caregivers determining how much their child has to eat (restrictive feeding practices or a clean plate philosophy) and children self regulating their hunger and satiety cues. A majority of caregivers (87%) were familiar with this behavior (Table 3) and 93% felt it would help keep a child from becoming overweight (Table 5). Contrary to previous results, 13 caregivers (43.3%) stated that they always follow this behavior (Table 7).

Responses included “father is overweight and eats large portions, I don’t want that for the kids”, “we’ve been in Head Start for 5 years and a little bit of everything is good”, “we use child size plates and they can have seconds”, and “portion out everything, it should be balanced”. There were four caregivers that stated they never follow this behavior. Responses included “give as much as they can eat and don’t force” and “eat till they’re full and don’t worry about portions”. It appears from these responses that those who are *not* worried about portion sizes may be benefiting their children by allowing them to determine when they are full and how much they want to eat. However, findings by McConahy et al. indicate that food intake behaviors are important predictors of energy intake among preschoolers (59). Their results showed that portion sizes were positively related to both energy intake and body weight and that portion size was the major predictor of variability in energy intake (59). If children have not had good examples of healthy eating they may not self regulate well and overeat if they are given large portions.

Comparison of Mother/Child Obesity and Behaviors Followed

Caregivers were asked if they “always”, “sometimes”, or “never” followed each behavior (Table 7). However, if a caregiver had responded that they were unfamiliar with a behavior they would not have indicated how often they follow it, resulting in total responses that do not add up to thirty. Surprisingly, few caregivers stated that they “never” follow behaviors. *Spend less time with computers and video games* had the greatest number of responses with six caregivers (26.1%) stating they “never” follow this behavior. However, at least two caregivers indicated in interviews that they do not own computers or video games therefore, it is easy for them to be avoided. *Eat out less often,*

make wise snacking choices, and eat breakfast everyday all had zero responses, indicating that all caregiver's either "always" or "sometimes" follow these behaviors. According to the US Census Bureau, moms are more likely than dads to eat breakfast and dinner with their children, even in two parent households (60). In the present study, 29 out of 30 caregivers were female. Only one caregiver stated they "never" *eat together as a family* and zero caregivers said they "never" *eat breakfast every day*. These responses may reflect the female dominant population interviewed. One of the more commonly discussed behaviors *tell children to eat all of the meal before getting dessert* also had only one caregiver response that they "never" followed this behavior. According to focus groups held by the US Department of Agriculture low-income mothers did not believe that their children would or could make responsible choices on their own about what and how much to eat (61). In the present study a majority of caregivers (73.9%) stated that they "always" follow this behavior. Always, following this behavior may indicate that children are required to clean their plate before getting dessert or are pressured to eat what caregivers feel is "enough". Either way, results show that children are not being allowed to make their own decisions on how much they want to eat and when they are full.

Table 7. Behaviors always, sometimes, or never followed by caregiver's.			
	Always n (%)	**Sometimes n (%)**	**Never n (%)**
Behavior			
Decrease intake of sweetened beverages[a]	17 (60.7)	10 (35.7)	1 (3.6)
Watch portion sizes[b]	13 (50.0)	9 (34.6)	4 (15.4)
Eat out less often[b]	12 (46.2)	14 (53.8)	0 (0.0)
Make wise snacking choices[c]	15 (51.7)	14 (48.3)	0 (0.0)
Eat breakfast everyday[c]	28 (96.6)	1 (3.4)	0 (0.0)
Eat less foods with empty calories[d]	8 (40.0)	11 (55.0)	1 (5.0)
Eat more fruits, vegetables, and whole grain foods	21 (70.0)	8 (26.7)	1 (3.3)
Allow children to eat all foods brought into the home[e]	10 (52.6)	8 (42.1)	1 (5.3)
Choose healthful foods when eating out[f]	8 (29.6)	18 (66.7)	1 (3.7)
Tell children to eat all of the meal before getting dessert[g]	17 (73.9)	5 (21.7)	1 (4.3)
Eat together as a family[c]	25 (86.2)	3 (10.3)	1 (3.4)
Spend less time with computers and video games[g]	11 (47.8)	6 (26.1)	6 (26.1)
Watch less TV and videos	10 (33.3)	17 (56.7)	3 (10.0)

[a]Only 28 out of 30 responses were available
[b]Only 26 out of 30 responses were available
[c]Only 29 out of 30 responses were available
[d]Only 20 out of 30 responses were available
[e]Only 19 out of 30 responses were available
[f]Only 27 out of 30 responses were available
[g]Only 23 out of 30 responses were available

Caregivers that "always" followed ten (76.9%) or more behaviors were compared to those who followed nine or fewer behaviors to determine if there was a difference between caregiver or child BMI's (Table 8). There were five caregivers (18.5%) who "always" followed ten or more behaviors and 22 (81.5%) who followed nine or less. Three caregivers were excluded from calculations because they were pregnant at the time of data collection. When compared, caregivers who "always" followed ten or more behaviors had a lower average BMI (26.8, overweight) then the average BMI of those

who followed nine or fewer behaviors (30.9, obesity). Both groups were above the normal BMI range of 18.5 to 24.9. It is difficult to compare BMI's of children as age and sex characteristics also need to be considered. However, there was only a BMI difference of 0.8 between the two groups. These comparisons may have indicated that caregivers who are concerned about their own health and fitness pass on their beliefs and behaviors by role modeling for their children.

Table 8. BMI comparison of caregiver's who always followed ten or more behaviors to caregiver's who followed nine or less.

	BMI[a] ± SD			**BMI[a] ± SD**	
Always Followed n (%)	**Caregiver**	**Child**	**Not Always Followed n (%)**	**Caregiver**	**Child**
5 (18.5)	26.8 ± 4.3	19 ± 8.1	22 (81.5)	30.9[b] ± 9.8	19.8 ± 7.3

[a]BMI's are calculated averages
[b]Only 20 out of 22 BMI's were available

Card-Sort Method

Throughout this study the card-sort method as a means of gathering information on caregiver-child interactions and key behaviors proved useful to an extent. The card-sort was an engaging process which allowed caregivers to be both mentally and physically involved in the interview. However, in situations where caregivers had young children at home with no one else to watch them they seemed distracted and appeared not to put much thought into their sorts, just wanting to get through the process. The card-sort method was also time efficient as most interviews lasted less than one hour with a substantial amount of data collected. Along with the card-sort it was also necessary to use probing questions to gather information as some caregiver's would give only "yes", "no", or brief responses. Probing is a technique that must be learned and different interviewers may probe in unique ways altering the type of information collected. Caregivers appeared to be satisfied with the card-sort method for data collection.

CONCLUSIONS

The first objective of this study was to determine with caregivers of low income children the awareness, use, reason for using or not using, and belief in the connection with childhood overweight and common health messages. At least seventy five percent of caregivers were familiar with ten out of the thirteen behaviors. All 30 caregivers were familiar with four behaviors which included *make wise snacking choices; eat more fruits, vegetables, and whole grain foods; eat together as a family; and watch less TV and videos*. This corresponded with two behaviors that were "always" followed by the most caregiver's, *eat more fruits, vegetables, and whole grain foods* (86.2%) and *eat together as a family* (70%). These results may indicate that understanding and being familiar with a behavior can lead to its implementation. In contrast, the other two familiar behaviors *make wise snacking choices* and *watch less TV and videos* were in the bottom half of behaviors that were always followed. *Watch less TV and videos* was actually the least followed behavior (33.3%) behind *choose healthful foods when eating out* (29.6%). These results may indicate that being familiar with a behavior is only half the battle and how convenient the behavior is may also play a role.

A common behavior targeted for intervention with childhood overweight and obesity is *eat less foods with empty calories*. This study found that only 66% of caregivers were familiar with this behavior and only 40% "always" followed it. It is not surprising then that many incorrect interpretations were given. It is apparent that there is confusion and misunderstanding concerning this behavior and it is necessary to educate caregiver's on its meaning so it can be followed and implemented successfully.

Over half of caregiver's (>50%) felt that 12 out of the 13 behaviors, if followed would help keep a child from becoming overweight. Again, behaviors most familiar to caregiver's, *make wise snacking choices* and *eat more fruits, vegetables, and whole grain foods* were also viewed as mostly likely to keep a child from becoming overweight. Although, *eat together as a family* was familiar to 100% of caregiver's and "always" followed by 86.2%, 43.3% were unsure or did not think following this behavior would help keep a child from becoming overweight. These findings may indicate that some key behaviors are being followed due to family tradition or ways of life and not specifically because they are viewed as positive behaviors for preventing overweight. Again, ways to educate caregivers as to why a behavior is key to obesity prevention and how it can be implemented need to be explored further. The behavior causing the most confusion was *allow children to eat all foods brought into the home*. This behavior was also the most unfamiliar to caregiver's and 56.7% stated that this behavior would not keep a child from becoming overweight. However, since 50% of caregiver's were unfamiliar with this behavior it is possible they didn't understand how to relate the question to the behavior.

"Clean your plate" was a common theme identified with *tell children to eat all the meal before getting dessert*". Since it has been shown that requiring children to clean their plate can lead to an inability to recognize hunger cues and therefore overeat, it is interesting that 60% of caregiver's thought it would keep a child from becoming fat. It must also be noted that with low income families requiring children to "clean their plate" may also be done out of necessity. Caregivers may feel that they are wasting valuable food that may not always be available if it is not all consumed. There were also many

misconceptions regarding *eat less foods with empty calories* and *decrease intake of sweetened beverages* suggesting that lack of education and knowledge may be contributing to obesity conducive behaviors. These results may indicate that even though caregivers can state what behaviors should be followed or implemented they do not know or understand how to apply them. Since many of these caregiver's have received nutrition counseling as part of federally funded programs it is possible they responded to questions based on what they have been told and not by what they actually do.

The second objective was to determine if there is a connection between the use of these messages and self-reported weights for caregivers and their children. When compared, caregivers who "always" followed ten or more behaviors had a lower average BMI (26.8, overweight) then the average BMI of those who followed nine or fewer behaviors (30.9, obesity). However, both groups were above the normal BMI range. These comparisons may show that caregivers who are concerned about their own health and fitness pass on their beliefs and behaviors by role modeling for their children.

The third objective was to pilot test the card-sort procedure interview method with primary caregivers, to determine its usefulness in assessing caregiver-child interactions of children at risk for overweight or obesity aged 4-10 years old. Throughout this study the card-sort method proved to be useful, with some limitations including probing questions being required to obtain complete answers to questions and caregiver's being easily distracted and rushing to sort through the cards.

Limitations

Limitations of this study include that the card-sort method does not allow for in depth assessment of quantity such as food consumed and frequency of activities. Probing techniques which can vary from each interviewer (2 interviewers were used) needed to be utilized to further understand caregiver responses to the card-sort. Heights and weights for BMI calculations of caregiver's and children were self reported by the caregiver and may be inaccurate as caregiver's had difficulty remembering information on their children and may under report information on themselves. Some caregiver's could not remember heights and weights so BMI's were not able to be calculated. There is a possibility that not all questions were understood by caregivers due to culture and/or educational level. There were only 30 caregivers interviewed, which indicates these subjects may not be typical of other low income caregivers and their children. Since the results were based on interviews, it is difficult to determine if caregivers reported the actual answers or if they gave responses that they thought the interviewer expected them to answer, wanted to hear, or they had heard from other nutrition professionals working for federally funded programs.

Applications

Childhood obesity is a multifaceted issue that has been widely targeted as a starting point for obesity prevention and interventions. Researching how family influence, the home environment, caregiver-child interactions, and interpretations of behavior meanings/understanding impact child weight and eating behaviors may be key to addressing and understanding the core causes of obesity. Preventative measures need

to be developed and implemented early on to decrease the risk of children becoming overweight. For interventions to be successful, caregivers need to have correct understanding and knowledge of what behaviors to follow and how they can be implemented. Caregiver's need a strong support system from the community and buy in from themselves and their children for interventions to be successful. Key behavior's associated with childhood overweight and obesity should be addressed as early on as pregnancy and possibly incorporated into birth preparation classes at hospitals and clinics. It also needs to be addressed in daycares, preschools, grade schools, hospitals, clinics, pediatrician's offices etc. to make sure both children and caregiver's are understanding behaviors associated with overweight and lifestyle modifications they can make to ensure success. Caregivers can have a positive influence on the diets of young children and need to understand their role and parental feeding practices. Children also need to learn how to self regulate hunger and eating patterns and engage themselves in physical activity. Further research in this area is needed to increase understanding of caregiver knowledge and beliefs about certain obesity associated behavior's so healthcare professionals can develop effective strategies and programs to prevent the onset of childhood obesity.

Acknowledgements

A sincere thank you, to Dr. Kaye Stanek Krogstrand for serving as chair of my committee and to Dr. Wanda Koszewski and Dr. Nancy Lewis for serving as my committee members. I appreciate your dedication to education and advanced knowledge of health and nutrition. Thank you also to my family and friends for their encouragement, and to my husband Nick who's love and support have helped me through the most difficult times.

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APPENDIX A

Adult and Parental Informed Consent Form

University of Nebraska Lincoln

IRB#2002-07-356 FB
Date Approved: 05/03/07
Valid Until: 08/29/07

COLLEGE OF EDUCATION AND HUMAN SCIENCES
Department of Nutrition and Health Sciences

ADULT AND PARENTAL INFORMED CONSENT FORM

FOOD PROVISION COMPETENCE AND THE PARENTING OF CHILDREN ENROLLED IN THE SPECIAL SUPPLEMENTAL FOOD PROGRAM FOR WOMEN, INFANTS AND CHILDREN (WIC) AND/OR THE NUTRITION EDUCATION PROGRAM (NEP)

You are invited to participate in this research study because your child is a participant in WIC and/or NEP. The following information is provided in order to help you make an informed decision whether or not to participate. If you have any questions please do not hesitate to ask.

In this study we will try to learn about your child's eating habits. To do this we will ask you general questions such as your age, education level, ethnic background, questions about feeding your child, and your beliefs about being able to provide nutritious foods. We will also ask you questions about the family environment and financial stresses in the home. If evidence of abuse is disclosed, per Nebraska State Law, proper authorities will be notified. In order to obtain additional information on your child's diet, we will phone you at home approximately one week after the interview. The information collected may be beneficial in helping your child, and other children, obtain the best nutrition possible.

The interview will take place at this WIC clinic or an NEP location and will take approximately 45 minutes to 1 hour of your time. The follow up phone call will take approximately 15 minutes.

There are no other known risks to the interview questions asked for the research. You may experience very slight discomfort in answering some of the questions. You are free to not answer a question(s), or to discontinue the process at any time. The interview will be tape recorded with the information on the tape identified only by an assigned subject number. The information on the tape will be typed at a later time by a research assistant. The tapes will be stored in a locked cabinet in the main researcher's office and destroyed after three years.

Parent/Legal Guardian's Signature

110 Ruth Leverton Hall / P.O. Box 830806 / Lincoln, NE 68583-0806 / (402) 472-3716 / FAX (402) 472-1587

IRB#2002-07-356 FB
Date Approved: 05/03/07
Valid Until: 08/29/07

As a result of participation in this research, it is possible that the cause(s) of poor nutrition in a child will be determined and then can be corrected. This is important to your child's growth and development. When you complete these procedures, you will receive a total of $20.

Any information obtained during this study that could identify you will be kept strictly confidential. You will receive an ID number that will be used throughout the study. Your name will not appear with the information collected. All data and identifying information will be stored in a locked cabinet in the main researcher's office and will only be seen by the researchers then destroyed three years after the research project is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings, but your identity and your child's identity will be kept strictly confidential.

Your rights as research subjects have been explained to you. If you have any additional questions concerning your rights as a research participant, you may contact the University of Nebraska-Lincoln Institutional Review Board (UNL IRB), telephone (402) 472-6965.

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship or your child's relationship with the investigators, the University of Nebraska-Lincoln, WIC, or NEP. Your decision will not result in any loss of benefits to which you are otherwise entitled.

DOCUMENTATION OF INFORMED CONSENT

YOU ARE VOLUNTARILY MAKING A DECISION WHETHER OR NOT TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE CERTIFIES THAT YOU HAVE DECIDED TO PARTICIPATE HAVING READ AND UNDERSTOOD THE INFORMATION PRESENTED. YOU WILL BE GIVEN A COPY OF THIS CONSENT FORM TO KEEP.

_____ _____

SIGNATURE OF PARENT/LEGAL GUARDIAN **DATE**

IN MY JUDGEMENT THE PARENT/LEGAL GUARDIAN IS VOLUNTARILY AND KNOWINGLY GIVING INFORMED CONSENT TO PARTICIPATE IN THIS RESEARCH STUDY.

Hillary Dietz, RD, LMNT
SIGNATURE OF INVESTIGATOR

DATE

IDENTIFICATION OF INVESTIGATORS

Names and Phone Numbers of Investigators

Kaye Stanek Krogstrand, PhD	Principal Investigator	Office: (402) 472-5285
Sheran Cramer, PhD	Secondary Investigator	Office: (402) 554-2450
Rochelle Dalla, PhD	Secondary Investigator	Office: (402) 554-2356

APPENDIX B

Interview Script

Instructions	Script
Obtain INFORMED CONSENT Have mother sign two copies of the form. Sign the form as the witness. Give one copy to the subject and place one copy in the folder	**Read the consent form to the subject.** Okay, before we begin I am going to give you this bag in appreciation for your time.
Turn on tape-recorder **Never mention subject's name during the interview**	I am going to turn on the recorder now. Thank you for agreeing to help us.
Card Sort Sort #1a (for 10 mothers)	
Take out the message cards and place in front of subject. Read each card aloud.	Okay – the first thing we will do is look through these cards on which there are suggestions that doctors and nutritionists give to parents about feeding children. We know every one may not have heard of all of these. We also know that some of these may not be right for every family.
Place a checkmark in the appropriate column on sheet #1 **Place the stack of unfamiliar suggestions to the side.**	First, please sort through the cards and divide them into 2 piles: those that you have heard about and those which you haven't heard about.
Card Sort Sort #1b (for 5 mothers)	
Take out the topic cards. Read each card aloud. **Place a (+) or (-) sign under the *familiar* column on sheet #1 to indicate if what they say is correct.** **Now change to the message stack of cards and follow instructions for Sort #1a above.**	Okay – tell me what you have heard about this topic.

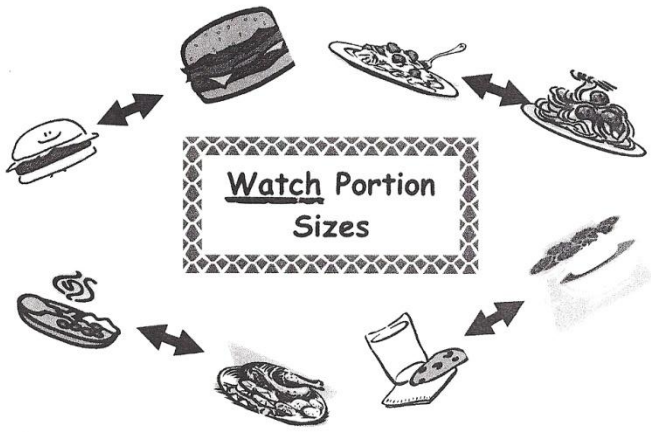
Sort #2 **Record answers on sheet #1. Place a checkmark in the appropriate column.**	Okay, now for each suggestion you have heard about, divide the cards again. This time make 3 piles: ones you always or usually follow; ones you sometimes follow; and ones you seldom or never follow. Great – remember no one is going to judge you no matter what you do or don't do.
Place the stack of suggestions that are rarely followed to the side. **Record significant words on sheet #2**	Let's look at the suggestions you *always* or usually follow. Can you explain what made you decide to do this? What makes this a priority for you and your family? *PROBES*: How does this work for you – is it easy for you to do or hard for you to do? What happens if someone in your family objects?
Record significant words on sheet #2	For the ones you *sometimes* do, can you tell me when you follow these? Again, why and how do you do these? *PROBES*: (see above)
Go back to the *rarely* followed stack. Record significant words on sheet #2	Okay – this pile contains suggestions you *do not* follow. Can you tell me why?
Go back to the unfamiliar stack of cards **Record significant words on sheet #2**	Now, let's go back to the stack of cards that are suggestions you have never heard about. Tell me, what do you think about them? *PROBES*: How would they work for your family? How would you go about making the suggestion happen? How do you think your family would react if you started to follow this suggestion?
Sort #3 **Put all cards together in the order listed on the recording sheet. Record answers on sheet #1**	Terrific. Let's put all the cards back together again. As you go through each card, tell me if you think other families would find these hard or easy to do.
Record significant words on sheet #2	Why do you think that?

Sort #4 **Record answers on sheet #1** **Record significant words on sheet #2**	Tell me, as you go through each card, do you think the suggestion would help keep a child from becoming fat? Could you explain why you said yes or no or unsure?
Record answers on sheet #3	Okay, we are just about done with the cards. What do the underlined words mean – how would you explain them? *PROBES*: How would you tell another mother like yourself about this suggestion? What ideas might you give to her to help her make these suggestions work for her family?
	Okay – we are finished with the card sort.

Silhouettes **Record answers on demographic sheet.**	Now I would like to show you some pictures. This first page has women of different sizes. Which one best corresponds to your body? Okay, now look at the page related to your child. Which one best corresponds to your child's body?
Demographics **Record answers on demographic sheet**	The last thing we will do is complete this sheet that describes you and your family. I will record your answers on this sheet.
End of Interview	Turn off recorder. Ask the mother if there is anything else they wish to tell you. Thank mother.

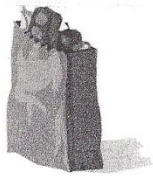
APPENDIX C

Card-Sort Behavior Cards



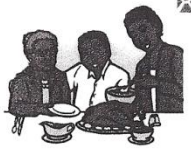
Watch Portion Sizes

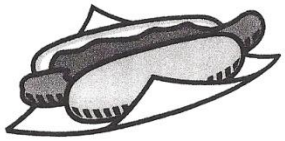
Tell Children to Eat All of the Meal Before Getting Dessert

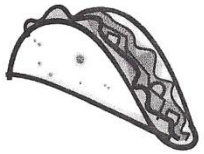


Allow Children to Eat All Foods Brought Into the Home

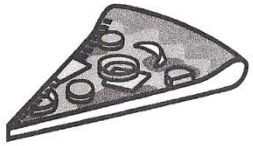
Eat Together as a Family



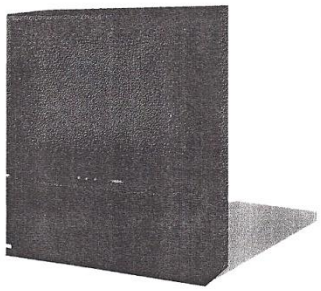


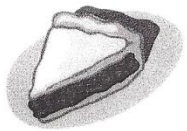


Choose Healthful Foods When Eating Out



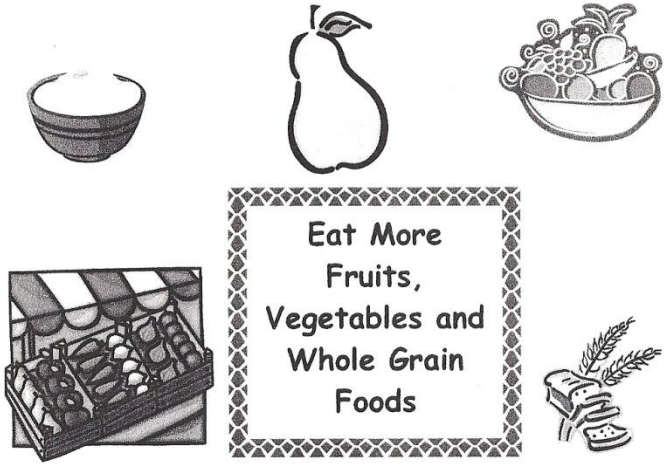
Watch Less TV and Videos



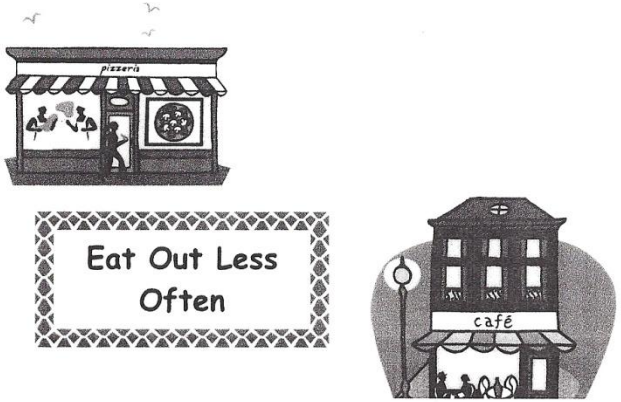


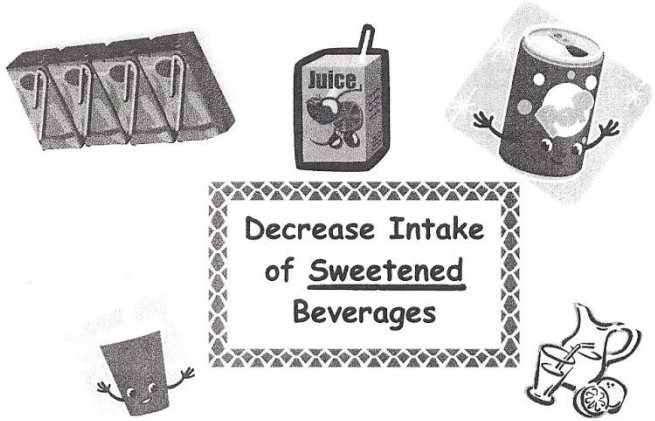
Eat Less Foods With Empty Calories

Eat Breakfast Everyday

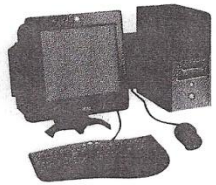

Eat More
Fruits,
Vegetables and
Whole Grain
Foods

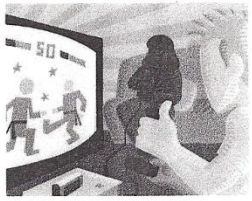

Make Wise
Snacking Choices
NUTS


pizzeria
Eat Out Less
Often
café


Juice
Decrease Intake
of Sweetened
Beverages

Spend Less Time
With Computers
and Video Games





Familiar

Unfamiliar

Always or
Usually

Never

Sometimes

Easy to do

Hard to do

Yes

Unsure

No

APPENDIX D

Card Sort Recording Sheet #1

Interviewer Initials _____ State _____

Date of Interview _____ Family Number _____

Card Sort Recording Sheet #1

Interviewer instructions: write down significant words or phrases

Behavior	Sort One		Sort Two			Sort Three	
	Familiar	Unfamiliar	Always	Sometimes	Never	Easy	Hard
Decrease intake of sweetened beverages							
Watch portion sizes							
Eat out less often							
Make wise snacking choices							
Eat breakfast everyday							
Eat less empty calorie foods							
Eat more fruits, vegetables and whole grain foods							
Allow children to eat all foods brought into the home							
Choose healthful foods when eating out							
Tell children to finish the meal before getting dessert							
Eat together as a family							
Spend less time with computers and video games							
Watch less TV and videos							

APPENDIX E

Card Sort Recording Sheet #2

Interviewer Initials _____ State _____

Date of interview _____ Family Number: _____

Card Sort Recording Sheet #2

Interviewer instructions: Check the appropriate box as the participant sorts cards for each sort number.

Behavior	Sort Two	Sort Three	Sort 4
Decrease intake of sweetened beverages			
Watch portion sizes			
Eat out less often			
Make wise snacking choices			
Eat breakfast everyday			
Eat less foods with empty calories			
Eat more fruits, vegetables and whole grain foods			
Allow children to eat all foods brought into the home			
Choose healthful foods when eating out			
Allow children to have dessert even if they did not finish their meal			
Eat together as a family			
Spend less time with computers and video games			
Watch less TV and videos			

APPENDIX F

Card Sort Recording Sheet #3

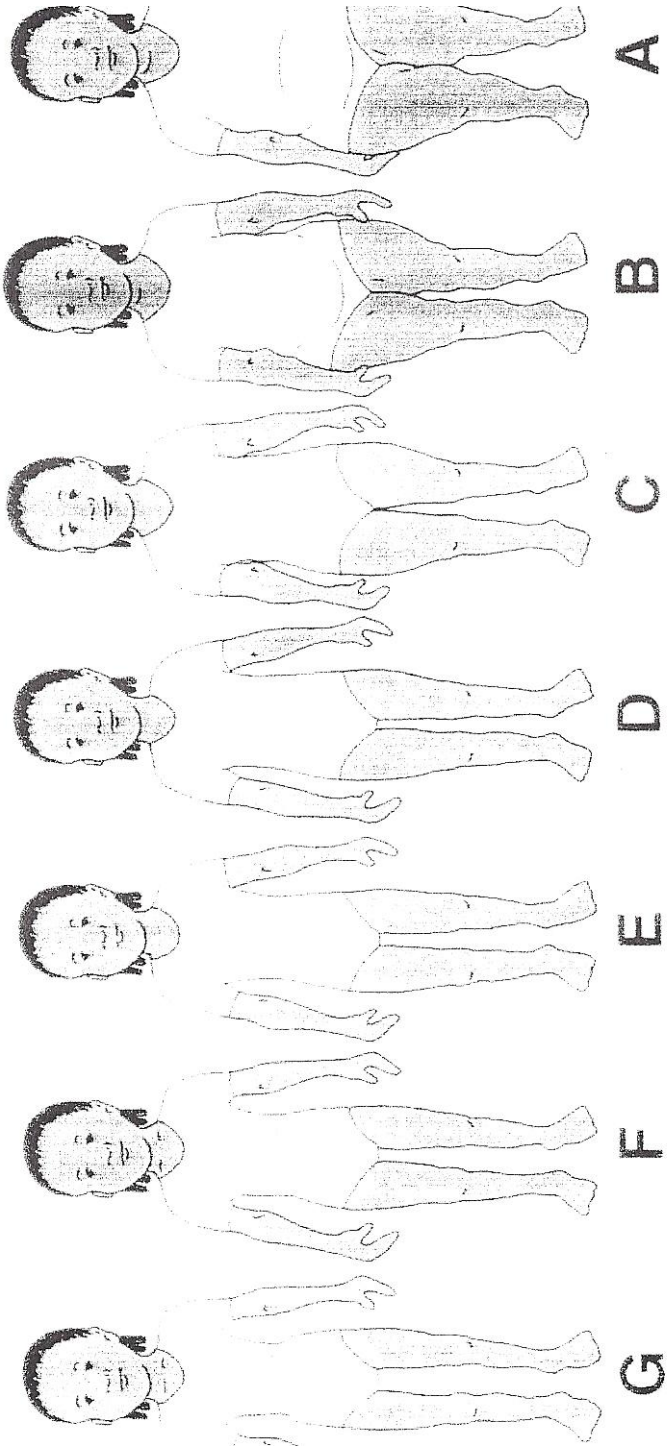
Behavior	Meaning of Underlined Words or Phrases
Decrease intake of sweetened beverages	
Watch portion sizes	
Eat out less often	
Make wise snacking choices	
Eat breakfast everyday	
Eat less foods with empty calories	
Eat more fruits, vegetables and whole grain foods	
Allow children to eat all foods brought into the home	
Choose healthful foods when eating out	
Allow children to have dessert even if they did not finish their meal	
Eat together as a family	
Spend less time with computers and video games	
Watch less TV and videos	

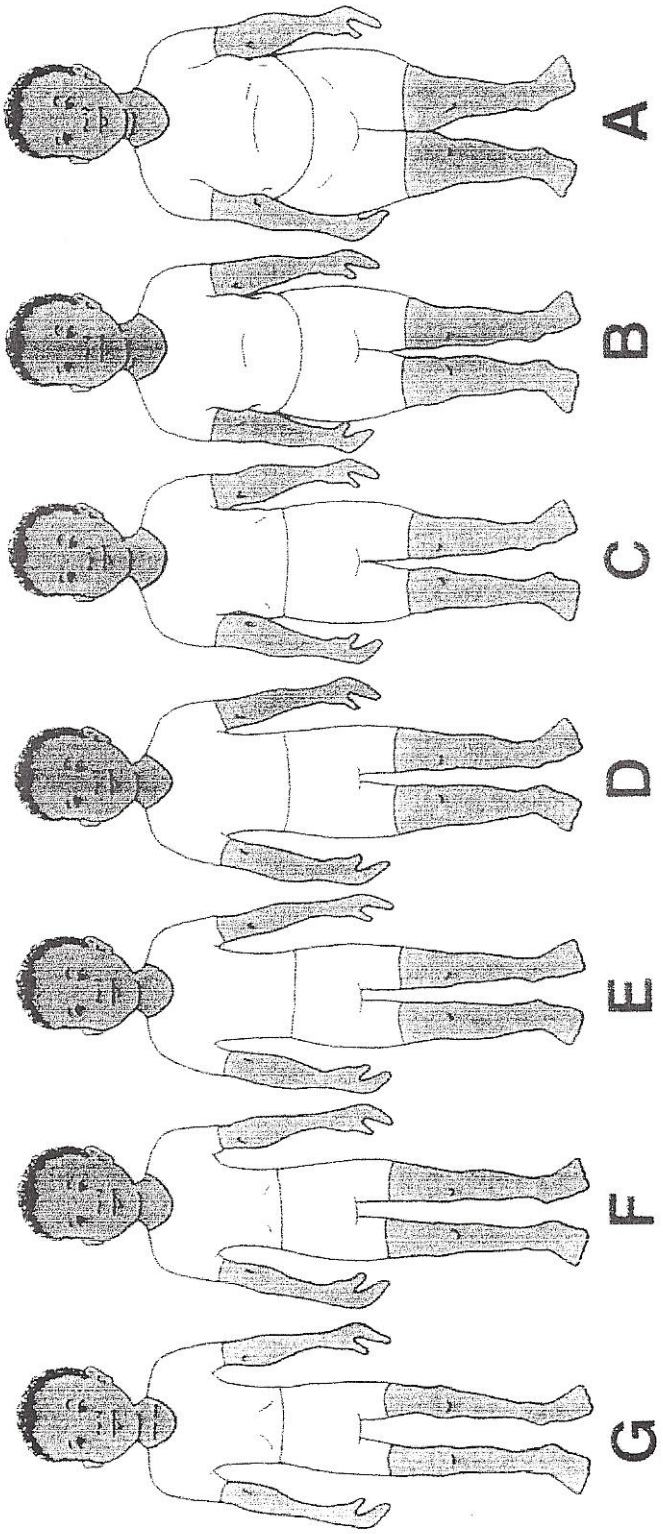
APPENDIX G

Body Figure Perceptions

Body Figure Perceptions

Adult - Female


A
B
C
D
E
F
G


A
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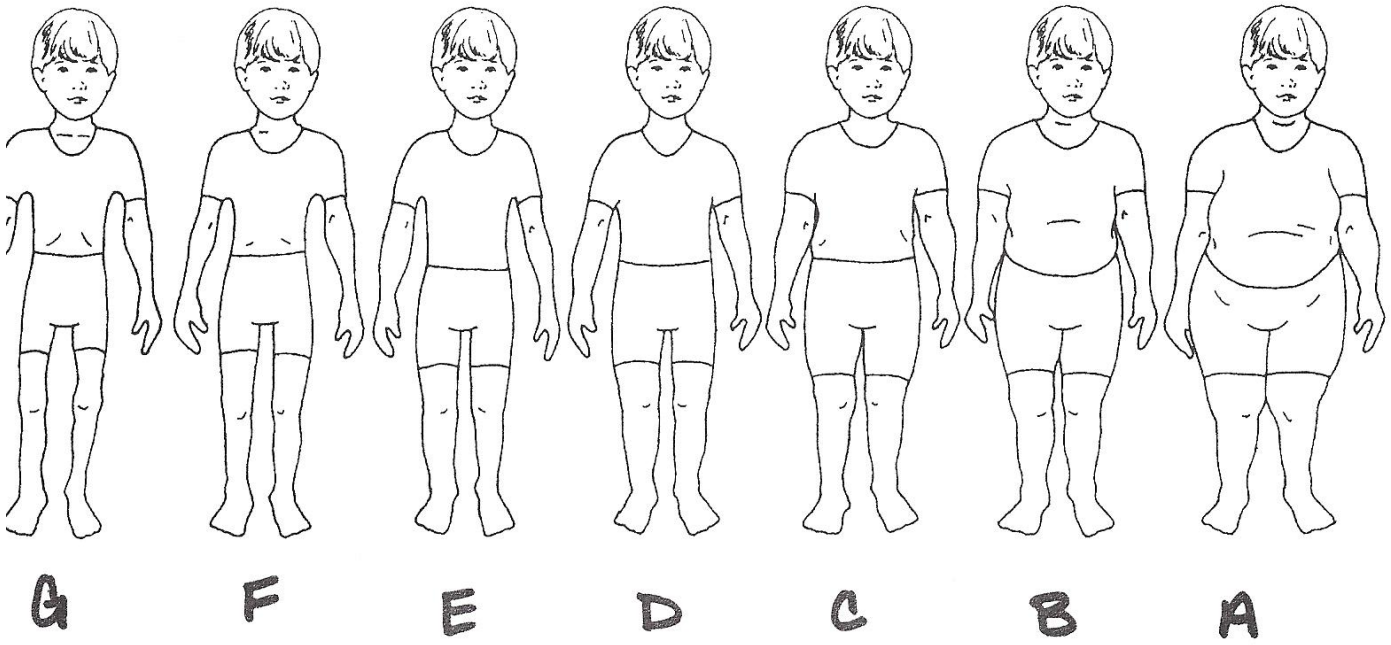
G
F
E
D
C
B
A

Я
В
С
Д
Е
Ғ
Б

APPENDIX H

Card Sort Demographic Information

Interviewer Initials _____ State _____

Date of interview _____ Family Number: _____

Card Sort Demographic Information

Silhouette Responses (insert number corresponding to answer)

Woman _____ **Boy** _____ **Girl** _____

For the following section, fill in the subject's responses.

Maternal Information

Age _____ **Weight** ____ **Height** _____

Race

American Indian or Alaska Native _____

Asian or Asian American _____

Black or African American _____

White or Caucasian _____

Other _____

Education level

Have not completed high school _____

Received high school diploma or GED _____

Some college or technical school _____

4-year degree or more _____

Zip code _____

BMI (to be calculated in office) _____

Ethnicity

Hispanic or Latino YES _____ NO _____

Employment Status

Homemaker _____

Not employed _____

Employed part time ____

Employed full time ____

Child(ren) Information (for children between 4 and 10 years old)

Age _____ **Gender** _____ **Height** _____ **Weight** _____ **BMI** (to be calculated in office) _____

Age _____ **Gender** _____ **Height** _____ **Weight** _____ **BMI** (to be calculated in office) _____

Age _____ **Gender** _____ **Height** _____ **Weight** _____ **BMI** (to be calculated in office) _____

Age _____ **Gender** _____ **Height** _____ **Weight** _____ **BMI** (to be calculated in office) _____