

Eating Patterns of the Rural Families of Overweight Preschool Children: A Pilot Study

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Abstract

Childhood obesity is one of the most multifaceted public health problems currently challenging the nation with serious medical and economic consequences for the future. Recognition of the increasing overweight status of children has prompted the need to identify factors associated with this trend. This study is the first to qualitatively examine eating patterns of families of overweight preschool children, aged three to five years, living in a predominantly rural agricultural area in the Northern Plains of the United States. This article presents the findings from an initial focus group interview. Ten parents of ten preschool children who were three to five years of age designated as being overweight or obese using body mass index measurements were recruited and interviewed. This paper presents preliminary findings (eating patterns) of a dually focused study related to healthy eating and physical activity in this selected population. The results of this study suggest that intervention focused on overweight parents of young children is warranted. Further focus group interviews and participant observation are required to add to the depth and scope of knowledge about strategies to prevent children from becoming overweight or obese.

Key Words: body mass index; eating patterns; overweight; parents; preschool

Introduction

Childhood obesity is an increasing public health concern. The National Center for Health Statistics of the Centers for Disease Control and Prevention (CDC) identified significant increases in the prevalence of overweight and obese children at younger than five years across all ethnic groups (Freedman, Khan, Serdula, Ogden, & Dietz, 2006). The prevalence of overweight status in children aged two to five years increased from 10.6% to 13.9% between 2001-2002 and 2003-2004 (Ogden et al., 2006). Additionally, younger children are at a higher risk of becoming overweight than older children and adolescents (Rappaport & Robbins, 2005). Several studies have found that overweight and obesity are more prevalent among rural children than their urban counterparts (Joens-Matre et al., 2008; Reifsnider et al., 2006). Therefore, the most vulnerable pediatric population to be overweight or obese is that of preschoolers from rural communities.

The definition of the 'obese' and 'overweight' child is often misunderstood. Phrases such as a 'healthy chubby child' and 'baby fat' only obscure what are meant by overweight and obesity among children. Most recently the CDC uses the term 'overweight' (as having a body mass index [BMI] at or above the 85th to less than 95th percentile for children of the same age and sex) and 'obesity' (as having a BMI at or above the 95th percentile for children of the same age and sex) to describe child weight status (CDC BMI-for-age growth charts, 2008).

With the understanding of an increasing preschool childhood obesity, the link between childhood obesity and persistent adult obesity (Guo, Wu, Chumlea & Roche, 2002; Nader et al., 2006) gives rise to further concern for the associated long term complications. Obese 3- to 5-year olds have a significantly greater risk of adult obesity than do their peers (Nader et al.). Childhood obesity is also associated with a higher prevalence of intermediate metabolic consequences and risk factors such as insulin resistance, impaired glucose tolerance, increased C-reactive protein concentration, increased blood pressure, and elevated blood lipid levels (Cook, Weitzman, Auinger, Nguyen & Diets, 2003; Weiss et al., 2004). Furthermore, obesity affects children's psychosocial well-being and can lead to depression and low self-esteem (Reeves, Postolache & Snitker, 2008).

Factors associated with an increase in the prevalence of overweight children and the development of childhood obesity are complex (Hesketh, Wake, Carlin & Crawford, 2002). The food environment provided by parents nurtures the child's preferences; these preferences may be linked to obesity (Lederman, Akabas & Moore, 2004). External cues, such as urging a child to eat everything on his or her plate and using a dessert as a reward instead of allowing internal cues such as hunger and satiety to regulate food intake, may lead to over consumption (Fisher & Birch, 1999). Parents' income and food prices can restrict the ability to purchase foods that are rich in nutrient value.

Parents who both work tend to favor prepared foods, which tend to be higher in fat (Crockett & Sims, 1995; O'Dea, 2003). Increasing parental reliance on fast food, coupled with increased consumption of fast food by children result both in more total energy, fat and sugar but fewer fruits and vegetables being consumed (Bowman, Gortmaker, Ebbeling, Pereira & Ludwig, 2004; Golan & Grow, 2004; Tucker & Irwin, 2006).

The purpose of this focus group interview was to explore the eating patterns and child feeding practices of parents with overweight preschool children aged three to five years living in a predominantly rural agricultural state. This study identified parental eating patterns that could contribute to early childhood obesity and suggested modifications. With more information about parental eating patterns, rural families could be empowered. The prevalence of childhood obesity can be reduced along with its associated immediate and long-term consequences.

Methodology

Research Design

The research design was qualitative descriptive since the intent of this study was to explore the eating patterns of families and child feeding practices of parents. The qualitative descriptive design keeps a researcher close to the data collected and does not require highly abstract interpretation of data from an event (Sandelowski, 2000). Some data is also presented in a simple descriptive numerical presentation (e.g., demographics and BMIs).

Data collection methods included a focus group discussion and a demographic survey. A focus group methodology guided by Krueger and Casey (2000) was conducted by requesting parents to describe the eating patterns of their family which included an overweight preschool child aged between three to five years. Eligible participants were biological parents, one of whom was responsible for family food preparation, with at least one overweight preschool child aged between three to five years (BMI \geq 85th percentile). All participants spoke English and provided written consent.

Participants

The focus group consisted of eight mothers and two fathers. The mean age of the parents was 30 years (range 25-35 years). Two parents had professional degrees, seven had some college, and one had a high school diploma. Seven parents worked full time, two worked part time and one stayed home. All parents lived within a 50 mile radius of a small northern plains city, an rural area as defined by the US Census Bureau 2000 criteria, with a population of approximately 65,000 (Population Division, U.S. Census Bureau, 2006). The mean age of the ten children was four (range 3-5 years). Seven children were boys. All but one of the children attended day care, and the remaining one stayed at home.

Procedure

Following approval by the university institutional review board, ten parent and overweight child pairs were recruited using media advertising and public postings. To encourage participating in the focus group, all participants were offered refreshments and a gift certificate after the focus group session. Eligibility screening was conducted when the prospective parent responded by calling for participation in the study. The parent was asked for the child's age, height and weight; the child's BMI was calculated for eligibility. The initial focus group was conducted in March of 2006 in a private meeting room. During registration, parents gave informed consent and permission to audiotape the session.

Two trained research assistants measured the height and weight of both the children and parents. Height was measured to the nearest 0.1 centimeter (cm) using a measuring tape fixed to the wall, with each participant standing with shoes off, feet flat on the floor together, and his/her back straight. Weight was measured, to the nearest 100 grams (0.25 pounds [lb]), using a manual medical scale with each participant standing with shoes off, no outer layers of clothing, and no other items that would add weight such as a hat, belt, key ring, or scarf. Measurements were taken twice and if the height and weight measurements differed by more than 0.1 cm or 0.25 lb respectively, measurement was repeated until conformance was obtained. Children were then escorted to an activity area while the parents completed a one- page demographic survey. Calculation of parent and child BMI was performed by converting the height from cm to meters and weight from lbs to kilograms and then dividing weight by height squared (Keys, Fidanza, Karvtnen, Kimura & Taylor, 1972).

After completion of the survey, the researcher led a round table focus group. The focus group was designed to be exploratory and semi-structured to allow for impromptu discussion and insights. Initial open ended questions were based on a review of the literature:

“What are some of the family’s daily meals?”

“Tell us about your family eating patterns”

“What factors influence your family’s food choice?”

“How would you describe your child’s weight?”

“What criteria do you use to determine if a child is overweight?”

“What kinds of things do you believe contribute most to early childhood obesity?”

The group discussion lasted approximately two hours and was audio taped. A research assistant facilitated discussion while the principal investigator made comprehensive field notes on group dynamics and nonverbal behaviors. Parents were given an opportunity to validate and clarify perceptions, subsequent to the researcher asking questions and making summative statements during the focus group process. This procedure added credibility to the data collected and later analysis of data.

Data Analysis

Verbatim transcripts of audiotapes were the primary data used in the content analysis as described by Miles and Huberman (1984). Notes taken during the focus group were analyzed along with the transcribed data. The researcher read all the transcripts while simultaneously listening to the tapes, to fill in missing words and to ensure the quality of the transcripts. Themes of the group discussion were systematically identified, categorized, and coded using NVivo qualitative analysis software (version 7, 2006). All analysis was verified by the research assistant and an external reviewer to minimize analyst bias.

Age, weight and height data of the parents and children were tabulated and the corresponding BMI calculated. The weight status of parents and children were categorized. The relationship between child and parental weight status was tested, plotted on a trend chart, and presented in the results.

Results

Content Analysis

The following findings focus on the analysis of the qualitative data. Since this is a pilot with only one focus group of ten parents representing ten families, the findings should be interpreted with caution and need further study with other rural focus groups to expand maximum variation within the purposive sample.

In the focus group, parents indicated that they had at least one meal each weekday with their children who attended day care; eight of them had all meals with their children during the weekends and holidays. The following themes emerged in response to the focus group questions.

Heavy Food Intake, Scarce Fruits and Vegetables

The parents in the focus group indicated consumption of high energy dense food and low intake of vegetables and fruit. One parent stated, *“Well, we usually have chicken nuggets, noodles, and pizza. Macaroni and cheese are common; otherwise it would be pizza or bread.”* Most parents indicated that each weekday, they had at least three meals and one or two snacks. On weekends or holidays, they had at least two meals and one or two snacks. Their daily snacks were also high in fat, calories, and sodium. For example, *“Our snacks are crackers, cookies and ice cream; sometimes bread sticks or potato chips.”*

Time, Food’s Price, and Taste are Essential

When parents were asked about their family’s eating patterns, they agreed that they decided what and when to eat on a daily, not a weekly basis. The types of foods consumed were influenced by food prices and amount of meal

preparation time. Parents complained that they did not have enough time to cook their children's meals. The most convenient choice was a fast food restaurant. For example:

"Both of us working, we are eating processed stuff all the time. It depends on how bad my schedule has been and the thought of having to cook and do dishes is too much so we end up at the fast food restaurant."

"Coupons are going to speak to what we are going to eat. Most of the time it is the dollar menu at any of the fast food places. Cost is a part of it."

"I like fast food. You can better gauge what you are going to eat and only order what you want so you don't have the leftovers. Vegetables and fruits are expensive, that would be the last thing we would buy."

Some parents claimed that the taste of food and the food preference influenced their food selection. For example, *"What we eat is based on taste. Our palate tells us what we want to eat. I don't cook it so I don't know the ingredients of everything."*

Parental Control of Food Intake

Parents controlled what their children ate at meal time. All parents indicated that they prepared one family meal rather than separate meals for children and adults. Most of the parents decided what and how much their child would eat. One parent stated:

"I told my child that you are going to eat what's put in front of you, and if you ask for it, you're going to eat it. I have a very strong will that if my child leaves some food on the plate, that is what is her supper; and don't ask me for other thing until you finish it."

One parent used dessert to control their children's intake. For example, *"I've influenced my kids that once your meal is done, those cookies are yours."*

Parents are a Model for their Children

Some parents knew that they were a model for their children. One parent said, *"Dad is a big influence on what we eat. He has to have meat and some sort of starch. He always put lots of butter and lots of sugar on rice and kids do that too."* Another parent said, *"My husband really likes ice cream, so we always have a huge tub of ice cream. And now my four-year-old likes it and he eats ice cream before he goes to bed."*

Barriers to Eating Fruit and Vegetables

In this study, most parents reported that they rarely purchased fruit and vegetables because of their high cost and because they spoiled quickly. One parent stated:

"I usually shop twice a month and get what I can. But you can't stock up on fruit because it doesn't last long. One time, I bought some oranges and they were dry. And my kid didn't eat it so we dumped it. From that day, I never bought oranges. Vegetables also don't last long and they are expensive."

The other parent agreed, *"Not only their high cost, my child doesn't like vegetables so I hardly buy them."*

Parental Perception

When asked, *"How would you describe your child's weight?"* most parents stated that they felt good about their child's body weight and were not worried about their child's overweight status. They did not realize that obesity prevention should start at a young age.

Some parents thought that their children were 'solid', but it was culturally acceptable to them. *"He is a solid boy but he is happy and I am happy about him. His is fine as long as I don't have to lift him."*

Some parents expressed that overweight in preschoolers was acceptable but they would be worried if their children became overweight when they were school-aged.

"I don't have a concern because he is active with different things. I will be worried if he is outgrowing during his school-age."

Some parents believed that heredity played a part in body composition. Interestingly, they thought that children, with one parent whose family was not overweight, would not become overweight.

"My family's side is big but my husband's side is small. She has his genes so I'm not worried. She would not become that big."

Parental Judgment

Parents defined overweight in children using their individual judgment, without reference to a standardized growth chart or weight per height percentile. One parent said:

"If he is skinny, I will see his ribs but when he gains too much, his love handles are showing. That's how I figure him. I don't really go by clothes because the dryer usually shrinks them. I really look at him when he has no clothes on."

Causes of Childhood Obesity

Some parents believed that candy, suckers, and juice were the prime cause of obesity in children. The following is a quote that a parent stated related to the cause of childhood obesity.

"It's always candy. No matter what holiday is, Easter, Halloween, or Christmas, they always eat piles of candy. Every place we go, they give you candy or suckers."

Another parent said, "I think juice. There are many people who give bottles to their babies every time they cry, even if they are not hungry. It starts there."

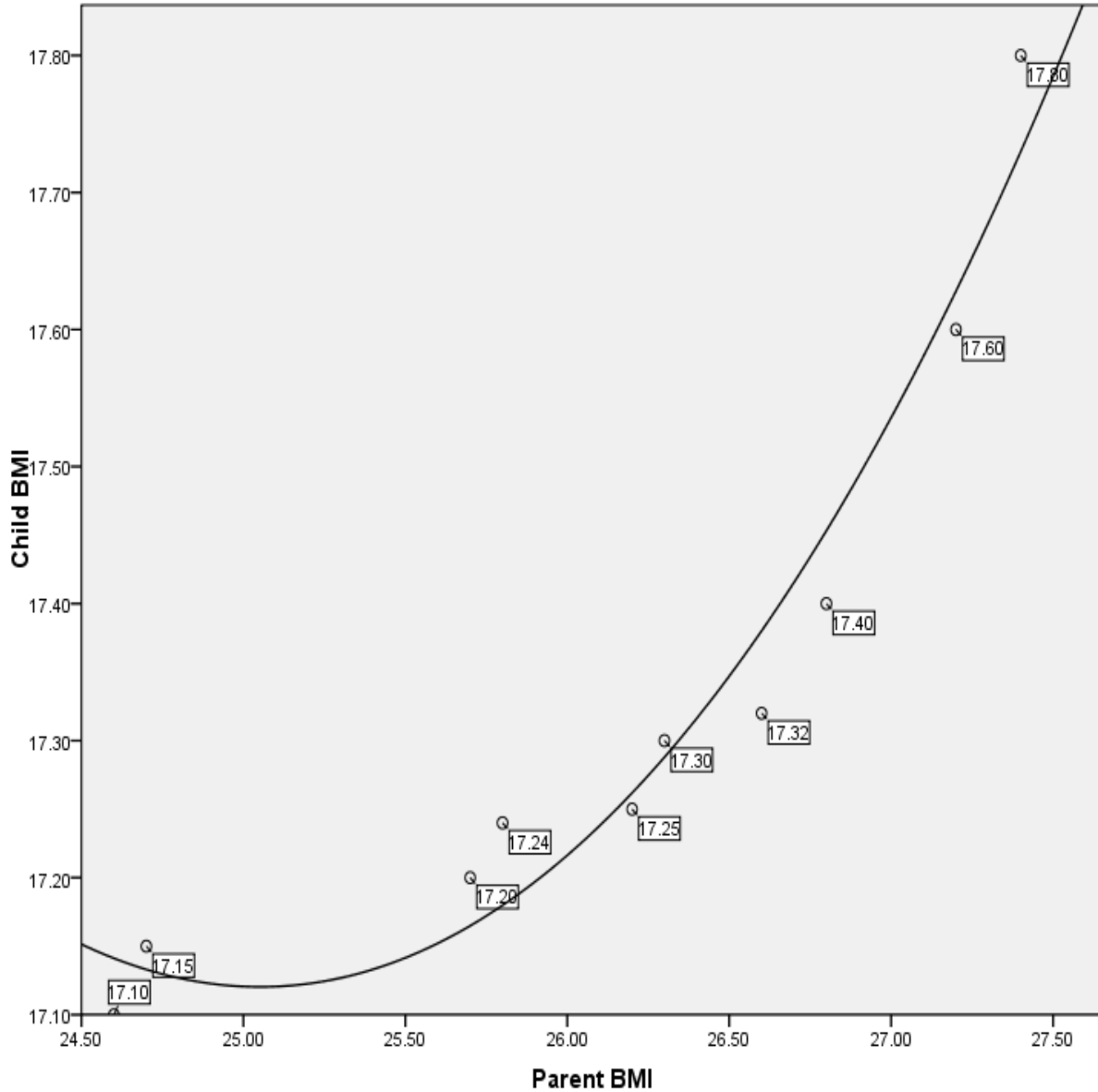
Some parents added that cold weather, inactivity and lifestyle contributed to childhood obesity.

"I think it is the weather. Kids are always hungry during the winter because they get bored. During the winter, my kid has no activities so she gained a lot. But during the summer, I know she will kick it off. Whatever she gains, she will kick off half of it during the summer."

BMI Analysis

While parents were recruited by having a preschool child with BMI \geq 85th percentile, the majority met the criteria for obesity (BMI > 95th percentile). At the same time, parents did not have to meet a weight criteria; however, the majority of parents themselves were overweight. Only two parents were normal weight (see Table 1). The mean BMI of parents and children were 26.1 (range 24.6-27.4) and 17.3 (range 17.1-17.8), respectively. The most striking result is illustrated in Figure 1. A cubic line seems to be the best model for the parent-child BMI correlation, which reveals that the more overweight the parents are, the more overweight are their children. Children whose parents were the most overweight were disproportionately more overweight than their counterparts.

Figure 1: Parent BMI vs. Child BMI



To explain the relationship between parental and child BMI, statistical evaluation of correlation (Spearman rank correlation coefficient) was employed. Statistical Package for the Social Sciences (SPSS), version 15.0, was used for the statistical analysis. Table 1 summarizes the number of parents and children in each BMI category and the relation between their BMI. The Spearman rank correlation coefficient ($r = 0.94$) between parental and child BMI was strongly significant ($p < 0.01$). The surprisingly high correlation is possibly due to the fact that eight of the ten participating parents were overweight mothers, a combination known to increase the probability for overweight children (Klesges, Klesges, Eck & Shelton, 1995). In addition, the limited range of parental and child BMI available to this study may have been an influence.

Table 1: Number and percentage (%) of parents and children in each BMI category and Spearman rank correlations (*r*) between parental BMI and child BMI

PARENTS	(n = 10)	CHILDREN	(n=10)
Normal weight (18.5 ≤ BMI < 25)	2 (20%)	Normal weight (5 th < BMI < 85)	0 (0%)
Overweight (25 ≤ BMI < 30)	8 (80%)	Overweight (85 th ≤ BMI < 95 th)	8 (80%)
		Obesity (BMI ≥ 95 th)	2 (20%)

Spearman rank correlations (*r* = 0.94, *p* value < 0.01)

Discussion

The eating patterns reported by the families in this study are not consistent with the revised recommendation for a healthy diet (U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2005). Families appeared to consume a diet high in fat and calories with infrequent intake of fiber, vegetables, and fruit. Evidence suggests that young children introduced to food high in fat and calories establish these food preferences (Lederman et al., 2004). Research has also suggested that parental eating habits affect the food intake of young children (Saarilehto, Keskinen, Lapinleimu, Helenius, & Simell, 2007). It, therefore, is important to establish healthy nutrition in families with young children before obesity becomes a problem.

In this study, parents' food choice was associated with food prices, household income, time constraints, tastes and preferences. These findings are consistent with previous research (Golan & Grow, 2004; O'dea, 2003). Parents' preference for fast foods is another barrier to regular consumption of fruit and vegetables. These demographic characteristics may put children at risk for overweight and obesity. Although there has been no longitudinal study on the effect of a fast food diet on body weight in children, reliance on fast food may replace the consumption of more nutritious vegetables, fruit, and grains.

In this focus group, some parents used dessert as a reward to children who cleaned their plates. This practice may interfere with the child's ability to regulate the amount of food that he or she consumes. The results might be overeating and higher risk of obesity (Golan & Grow, 2004; Johannsen, Johannsen & Specker, 2006). These learned behaviors may affect the children's weight status when they are older and have greater independence in food selection. Parents can reinforce positive eating behavior by offering rewards that are not based on food. A typical reward could be a family outing to a park or playground (Baker et al., 2005).

These rural parents were not concerned about their children's weight status, and this finding supported previous research (Baughcum, Chamberlin, Deeks, Powers & Whitaker, 2000; Eckstein et al., 2006). This is a serious concern because being overweight or obese puts the child at risk of illnesses later in life. This lack of parental awareness and interest in children's body weight affects the parents' ability to positively influence their children's weight (Carnell, Edwards, Croker, Boniface & Wardle, 2005). Moreover, waiting until children are in school may make obesity and morbidity difficult to prevent (Harvey-Berino, Wellman, Hood, Rourke & Secker-Walker, 2000). Parents' interest in their children's weight status, therefore, warrants attention.

These rural parents used their own perceptions to define overweight in their children. Most of them relied upon their perception of their child's body size to define overweight, not growth chart guidelines. These findings are consistent with the studies of maternal perceptions of child size that have been conducted in low-income families (Jain et al.,

2001; Reifsnider et al., 2006). It is very difficult to distinguish children who are at risk of being overweight from children who are not (Poskitt, 1995). To make a consistently accurate determination of at risk of being overweight in children, BMI must be determined and plotted on the appropriate growth chart.

Health professionals can educate parents on how to determine obesity in children. BMI is a quick and easy way to screen for childhood obesity. The CDC recommends using the percentile BMI for age and gender (CDC, 2008) as the most appropriate and easily available method to screen for children who are overweight or obese. Screening for obesity should begin in early childhood. Parents should receive information on the prevention of obesity as soon as a child begins to cross BMI percentiles and action should not be deferred until the child is at or above the 95th percentile of BMI for age and gender (Baker et al., 2005).

Most parents had some knowledge of the contributing factors to childhood obesity. The parents, nevertheless, had limited nutritional knowledge, so their children's diets were high in fats and calories; this contributed to their children's weight problems. Preventing obesity requires changing the eating pattern of the entire family. Therefore, the entire family must be actively involved in changing eating patterns and child feeding practices. Such changes demand conscious effort and support.

Some parents in this focus group held the belief that their child would grow up without being overweight if one side of the parents' family was small in stature. Biobehavioral research demonstrates modest to robust influence of genetics and environment on childhood obesity. Genetically, if one parent is obese, approximately 50% of progeny are likely to be obese (Epstein, 1996). The classic Stunkard twin study has revealed that BMI is highly correlated in identical twins, even if each twin is raised in a different environment (Stunkard, Harris, Pedersen, & McClearn, 1990). While children may inherit their build from one parent or the other, they do not inherit specific weights. Genetic factors can regulate body weight and determine an individual's susceptibility to gain weight despite diet and exercise (Farooqi, 2005). The parental belief in the myth that normal genetics of one parent protect a child can inhibit the need to change children's eating patterns.

While a number of studies report the relationship between obese parents and the risk of obesity in adulthood (Lake, Power, & Cole, 1997; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997), little is known about this relationship in early childhood (Klesges et al.). The present study suggests that child BMI is strongly associated with parental BMI. Children whose parental BMI was highest had a disproportionately higher BMI than their study counterparts. These findings portend that childhood obesity in the face of overweight parents may continue to rise more sharply than previously realized. The increase in childhood obesity with an increase in parental obesity was not foreseen, a more random influence being suspected. Evidence suggests that many conspiring factors leading to parental obesity are transferred relationally through the family dynamic (Rhee, 2008) and reflected in the degree of childhood obesity. Prevention efforts focused on overweight parents of young children are warranted.

The BMI of these children may be influenced by heredity and the food environment shaped by their parents; however, it is beyond the scope of this study to conclude causal relationship of these variables. Future research to replicate these potential relations in a larger and more diverse sample is warranted. Further, the results suggest the need for a collaborative intervention with parents.

Conclusion

The current increase in childhood obesity reflects the convergence of biologic, economic, social, parental, and regional factors. Research indicates serious medical consequences with the onset of early childhood obesity, not just with obesity in the adult years. The family is the central site to understand and prevent the onset of childhood obesity. Children learn most of their food and eating habits from their family environment and from interactions with their parents. Parents shape their children's eating patterns with the foods they make and provide, and in the way they interact with children at meals (Birch & Davison, 2001). It is essential to increase parental awareness of unhealthy eating patterns and instill corrective action in parents. Understanding parental eating patterns and child feeding practices are important first steps in effective health promotion intervention that will lead to better nutritional habits. The results of this study suggest that parental eating patterns, child feeding practices, and parental BMI contribute to obesity. Special attention needs to be placed on these variables to bring about appropriate feeding behaviors and food selection to improve the quality and quantity of children's diets.

Limitations

These preliminary results were acquired from one focus group interview. Although many of the findings were congruent with those from larger studies, care should be taken when generalizing the results. The results may be applicable to the snapshot taken here, but more research is needed on families from different educational, ethnic, socioeconomic, and regional backgrounds. Nonetheless, focus group discussion as a qualitative method can offer valuable insight into thoughts, perceptions and attitudes of a particular group. The results from this study revealed some unexpected aspects of obesity in families with preschool children in a rural setting. More research is needed to further explore the eating patterns of rural families with a pre-school child who is designated as overweight or obese. Participant observation coupled with focus group interviews would strengthen the credibility of the findings. The linkage between parental BMI and children BMI also suggests that there may be other factors contributing to this linkage such as epigenetic passage from parent to child (Tremblay & Hamet, 2008); however, further research is needed to understand this association.

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