

WIC EDUCATORS' IMPRESSIONS OF INFANT AND TODDLER FEEDING PRACTICES
THAT MAY LEAD TO CHILDHOOD OBESITY

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ABSTRACT OF THE THESIS

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Obesity rates among low-income children in the U.S. are higher than those of their higher-income counterparts. New Jersey's WIC-enrolled children have maintained a rate of obesity that is far above the national average. Consequently, obesity prevention has become a focus of several public health programs. Within NJ, both WIC and SNAP-Ed programs aim to provide low-income populations with educational resources to combat the rise of obesity among NJ's youth. The aim of this study was to identify the child feeding practices utilized by low-income, diverse parents and caregivers in NJ that may lead to infant and toddler overweight and obesity. Semi-structured, open-ended interviews were conducted with nutritionists and breastfeeding counselors at 8 NJ WIC agencies. At the close of each interview, participants were presented with a list of prompts compiled based on a review of potentially obesogenic child feeding practices found the literature. Data were coded using computer assisted qualitative data analysis software (NVIVO). Thirty-two (N=32) WIC staff members were interviewed, with interview times ranging in length from 16-43 minutes. A total of 22 feeding practices were identified, from which 4 themes emerged: feeding practices that support excessive energy intake; inappropriate bottle feeding practices; instrumental feeding practices (i.e., use of food as a reward or punishment); and, suboptimal food/beverage choice. Despite the high level of diversity among

NJ WIC's clientele, the feeding practices employed by them were found to be similar. While the majority of feeding practices found in this study were previously recognized in the literature as potentially associated with childhood obesity, two unique findings indicate that caregivers may benefit from education addressing infant rooting and sucking reflexes and on the contents and intended uses for nutritional supplements, as well as media literacy of nutritional supplement ads. Future research should explore the impact of nutrition supplement marketing on parents and caregivers and investigate intervention efforts that will lead to awareness and behavior change.

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CHAPTER 1: INTRODUCTION

Nationally, over the last two decades, low-income children have had higher rates of, and smaller decreases in, obesity prevalence than their higher-income counterparts.¹⁻⁴ Notably, New Jersey ranked among the three states with the highest rates of obesity among WIC enrolled children ages 2 to 4 years from 2000 through 2010.⁵ By 2014, New Jersey's obesity rate fell, but remained far above the national average of 14.5%.⁵

As such, obesity prevention was one of the foci of the Healthy Hunger Free Kids Act of 2010 (HHFKA).⁶ In an effort to address the obesity epidemic prevalent in the U.S., Sec. 241 of the HHFKA was designed to incorporate obesity prevention in State SNAP-Education plans.⁶ The Supplemental Nutrition Assistance Program-Education (SNAP-Ed), is a U.S. Department of Agriculture, Food and Nutrition Services program that is part each State's Supplemental Nutrition Assistance Programs (SNAP). Both prior to 2013, the year when the HHFKA was fully implemented, as well as thereafter, the SNAP-Ed guidance stated:

“The focus of SNAP-Ed is:

- Health promotion to help SNAP eligibles establish healthy eating habits and a physically active lifestyle.
- Primary prevention of diseases to help SNAP eligibles that have risk factors for diet-related chronic disease prevent or postpone the onset of disease by establishing more physically active lifestyles and healthier eating habits.”⁷

In the 2013 guidance, the following was added:

“SNAP-Ed Plans should include behaviorally focused, evidence-based nutrition education and obesity prevention interventions, projects, or social marketing campaigns that are consistent with FNS’ mission and the goal and focus of SNAP-Ed.”⁸

This addition retooled SNAP-Ed to include obesity prevention interventions, and to dictate that nutrition and physical activity education have a strong research base.

Also, prior to the passing of HHFKA, NJ SNAP-Ed was exclusively implemented through Rutgers Cooperative Extension. NJ SNAP-Ed aimed to educate low-income populations throughout New Jersey as an addendum to the NJ Supplemental Nutrition Assistance Program (SNAP).⁹ Nationally, SNAP/SNAP-Ed target audiences include individuals and families with maximum household incomes that do not exceed 130% of the federal poverty level.¹⁰ In New Jersey, and many other states, SNAP and SNAP-Ed services are extended to families whose income is as high as 185% of the federal poverty level.¹¹

Given the overweight status of New Jersey’s low-income children enrolled in WIC, as well as the fact that it was poised to fight obesity prevention alongside SNAP-Ed, NJ SNAP-Ed staff planned to create educational resources to target this vulnerable population, as very few program resources had been developed to target obesity-related child feeding practices. Program staff sought to partner with WIC, an organization composed of staff viewed as “experts” with regards to child feeding issues due to their direct work with the parents and caregivers of infants and

children. To support curriculum development, NJ SNAP-Ed staff developed an in-depth interview protocol to be done with these experts to ensure that curriculum materials were suitable to the target audiences' needs and culturally appropriate. Prior to the involvement of the author of this thesis, Rutgers the Institutional Review Board (IRB) approved interview protocol (E14-448) that was developed and piloted by a Master's student and her faculty advisor.

The pilot study performed was successful. As such, the author of this paper took the work a step further by expanding the research to include a larger sample size. This manuscript describes the larger study, with data from the pilot study merged for analyses.

Project Aim

To identify the child feeding behaviors employed by low-income, diverse parents and caregivers in New Jersey that may lead to childhood obesity among infants and toddlers. This was done through exhaustive interviews with all willing NJ WIC staff participants, to extract expert input on observed obesity-related child feeding practices among their diverse clientele to support the development of nutrition-education materials.

Thesis Format

Rutgers Graduate School-New Brunswick accepts dissertation formats with data chapters written in manuscript form ready for submission to peer reviewed journals. In this case, the following introduction and concluding chapters (Chapters 1-3 and 5) are written and referenced separately from the stand-alone data chapter (Chapters 4). The bibliography at the end of this dissertation is

subdivided by the chapters. The reference lists for Chapter 4 is formatted according to the author guidelines of the intended journal.

CHAPTER 2: LITERATURE REVIEW

Introduction

This literature review opens with an overview of pediatric obesity and its prevalence nationwide and in the state of New Jersey. Various practices identified in the literature that may be linked to childhood overweight and obesity are then discussed, followed by a description of the two federal nutrition programs that are related to this research [i.e., the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) and Supplemental Nutrition Assistance Program-Education (SNAP-Ed)]. Lastly, this literature review explains the method and mode of data collection and the analyses used for this research project.

Pediatric Obesity in the United States and New Jersey

Childhood Overweight and Obesity in the U.S.

Data collected from the periods of 1988-1994 and 2013-2014 (the most recent data at the writing of this document) showed the prevalence of overweight and obesity among infants and toddlers increased substantially in the United States.^{1,12,13} Infant overweight status has been defined as weight-for-length within two standard deviations of the 97.7th percentile;¹⁴ and pediatric “overweight” and “obesity” for children aged 2 years and older have been defined by weight-for-height percentiles being between the 85th and 94th percentiles and above the 95th percentile, respectively.¹⁵

While trends among low-income children had been similar to those found among other income categories,²⁻⁴ low-income children’s weights have consistently been higher than their

counterparts' in other income categories.^{1,4} As recent research shows a decline among children in other income categories, the obesity rates among low-income children have diminished to a lesser degree.^{1,4} Obesity prevalence among low-income children, aged 2 to 4 years, enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) steadily increased from 14.0% in 2000 to 15.9% in 2010.^{1,4} A slight decrease in obesity prevalence among this population occurred in 2014 (14.5%); however, rates still remained high compared to the national prevalence of obesity among children ages 2 to 5 years (9.4%).⁴ In 2014, obesity rates among 2 to 4 year old WIC-enrolled children varied among racial and ethnic groups.¹⁶ Prevalence was higher among American Indian/Alaska Native (18%) and Hispanic (17.3%) children than among non-Hispanic white (12.2%), non-Hispanic black (11.9%) and Asian/Pacific Islander (11.1%) children.¹⁶

Childhood Overweight and Obesity in New Jersey

In NJ, low-income children, aged 2 to 4 years, who are enrolled in WIC, continue to have alarmingly high obesity rates.⁵ New Jersey ranked among the top three states with the highest rates of obesity in children ages 2 to 4 years enrolled in WIC from 2000 through 2010, with percentages ranging from 18.6% to 19.6%.⁵ By 2014, New Jersey's ranking had dropped, yet it fell well above the national average (14.5%) with far more than 1 in 7 (15.3%) children enrolled in WIC remaining overweight or obese.⁵

Practices Linked to Childhood Overweight and Obesity

A variety of feeding practices are believed to contribute towards infant and toddler obesity.

These practices can generally be categorized as being related to what the child is fed or the parents' child feeding skills.

Breastfeeding versus Formula Feeding

Regarding infants, despite a number of inconsistencies found in the literature, the majority of studies support breastfeeding as a means of reducing the risk of overweight and obesity in comparison to formula feeding.¹⁷⁻²¹ While approximately half (52%) of infants are ever breastfed, less than 25% of infants are exclusively breastfed at 6 months of age.²² Exact mechanisms behind the preventative effect of breastfeeding are not explicitly known, however proposed explanations suggest that breast versus bottle feeding is an example that reflects issues surrounding how overweight results from overfeeding and/or nutritional content.^{20,23-25}

The composition of breast milk may have a protective effect against obesity.^{23,24} Compared with human milk, formula tends to offer a different nutrient profile often consisting of higher amounts of protein and overall energy,^{17,23} with an insufficient supply of hormone leptin, which regulates appetite and satiety.²⁴ This is further substantiated by an analysis of data from the Infant Feeding Practices II Study with findings indicating that infants fed both at the breast and by bottles containing expressed milk gained weight similarly; however, when combination feedings were done with bottles containing formula, infants gained an average of 45 grams more per month.²¹

Studies suggest that breastfeeding duration may also play a protective role in obesity prevention, as several studies have found that babies who were breastfed for longer periods (ranging from 6 months to over 1 year) gained less weight when compared with infants who terminated between 2-4 months.^{17,20,21}

Babies that are exclusively formula fed show significantly higher weight gain than babies fed exclusively at the breast.^{18,20,21} One proposed explanation for this finding is that breastfeeding supports the infant's responsiveness to satiety cues more so than formula feeding because parents are not directly controlling the amount of milk that is transmitted through the breast.^{23,25} Additionally, exclusive formula feeding has been shown to increase with age in infants.²⁶

There is evidence that parents who formula feed prepare formula incorrectly.^{27,28} Two systematic reviews found that errors in formula reconstitution were common among mothers, with frequent occurrences of over-concentrated feeding, and minor occurrences of under-concentrated feeding.^{27,28} Furthermore, both reviews found that mothers felt unprepared to take on formula feeding, and experienced negative emotions for having chosen not to breastfeed. While the relationship between incorrect formula reconstitution and infant obesity has not been studied extensively, existing research shows mixed results. One small scale study found that among formula fed babies, those who received over-concentrated formula feedings, gained significantly more weight than those who did not.²⁹ Another study found that while there was a relationship between infant weight gain and their formula's volume and energy content, there was no significant relationship found between their formula's concentration and their weights. One

proposed explanation was the likelihood of inconsistent formula preparation by mothers, which may result in over-concentration for one feeding, and under-concentration for the next.³⁰

Inappropriate Bottle Use

Another common and potentially obesogenic feeding practice that has been identified as commonly employed by low-income families is the practice of putting solid foods, such as cereal, in the infant bottle.³¹⁻³³ This practice has been documented as having been used with infants as young as 3 weeks old.^{31,32} It has been reported that this is done in an effort to help the baby sleep or feel full for longer.³¹⁻³³ Of note, the American Academy of Pediatrics (AAP) advises against putting solid foods in infant bottles and feeding solid foods to infants before 4 months of age.³⁴ Studies have shown that practices of this type can lead to increased calorie intake and elevated risk of childhood obesity.^{19,35-39}

Prolonged bottle use among infants and toddlers may also contribute to the pediatric obesity epidemic;²⁹⁻³³ however, it should be noted that recommendations for appropriate bottle weaning differ slightly between agencies. The U.S. Department of Agriculture, Food and Nutrition Service recommend weaning between 12 and 14 months of age,⁴⁰ while the AAP recommends weaning from the bottle before 18 months of age.⁴¹ However, a sizeable, national study (i.e., the Infant Feeding Practices II study (n=6750)) found it to continue as late as 24 months of age.⁴² Studies support the link between prolonged bottle use and higher incidence of overweight.⁴³ For example, prolonged bottle use has been associated with: a 3% increased risk of being in a higher BMI category per month of bottle feeding beyond 36 months,⁴⁴ and a positive correlation with having a BMI $\geq 95^{\text{th}}$ percentile at 5 ½ years of age when bottle fed beyond 24 months.⁴²

Prolonged bottle use is proposed to contribute to obesity due to the accessibility it provides to excess liquids – predominantly milk.^{43,45} Toddlers and children as old as 5 years of age were found to consume anywhere between 24 to 40 ounces of milk through the bottle per day, and studies have shown that excess milk intake is associated with higher weight status in children.⁴³

Along with prolonged bottle use, it has been proposed that taking the bottle to bed may be another contributor to infant and toddler overweight and obesity,^{46,47} as nearly 1 in 5 toddlers are put to bed with a bottle, nationally.⁴² One longitudinal study found that taking a bottle to bed caused children to be nearly twice as likely to be overweight or obese by age three.⁴⁷

Propping the bottle, typically referred to as a laissez-faire feeding style, has also been mentioned in the literature within the context of maternal distraction during bottle feeding and potentially obesogenic infant feeding practices.^{48,49} While there is a lack of research exploring the direct relationship between bottle propping and obesity, research does suggest a relationship between lack of parental responsiveness during feeding and infant weight.⁵⁰

Parental Responsiveness

Responsiveness to infant hunger and satiety cues by caregivers may also contribute to weight gain in infants.^{50,51} Responsive feeding involves identifying and interpreting verbal and nonverbal cues of the infant that signal hunger and satiety.⁵² This is a form of communication between the infant and its caregiver, and assumes that the infant is able to self-regulate by internal recognition of satiety.⁵⁰ Responsive feeding fosters the infant's ability to self-regulate

and in turn, moderate weight gain.⁵⁰ The importance of responsive feeding is further substantiated by the recognition that infant cues vary in clarity⁵⁰ and differ over time with regard to developmental stage,⁵³ suggesting that communication between parent and infant must continue in order to meet the needs of the child. Nonresponsive feeding has been found to be associated with increased feeding frequency and amount,⁵⁰ along with higher BMI or weight gain in children.⁵⁰⁻⁵² One study found that infants of mothers who were less responsive to infant cues and more controlling of feeding gained more weight by 1 year than infants of responsive mothers,⁵⁴ while another found that infants who showed high weight gain in the first 6 months of life continued this trend from 6-12 months only with high maternal control.⁵⁵

Introduction of Solid Foods

As infants age, solid foods are introduced. If it is done too early (i.e., before 4 months of age), this too has been shown to increase the risk of obesity.^{19,35-39} Despite recommendations, the Infant Feeding Practices II Study found that over 40% of infants were receiving solid food by 4 months of age.²⁶ While studies concerned with this relationship are inconclusive, the majority point in this direction.^{38,39} One study found that infants introduced to solid foods before 4 months were heavier at 7 and 14 months, and gained weight at a quicker pace between 8 and 14 months than infants not yet introduced to solids.³⁵ Another study found that introduction of solid foods in this critical time period, particularly among partially- or never breastfed infants, can be associated with a six-fold increase in obesity risk at 3 years of age.³⁶ Still another investigation found that children recognized as obese at 5 years were more likely to have been fed solid foods before 3 months of age.⁵⁶

According to the 2008 Feeding Infants and Toddlers Study (FITS) the most common complementary food fed was dry infant cereal, which was fed to 50% of the infants studied.⁵⁷ This was followed in popularity by vegetables and fruits.⁵⁷ In addition, desserts and sweets (e.g., cakes, pies, cookies and pastries) were consumed daily by nearly half of infants before 1 year of age,^{57,58} contributing to increased calorie intake. The 2008 FITS Study also found that on average, infants ages 6-11 months consumed 157 calories more than their recommended daily intake.¹⁸ Excessive calorie intake can lead to weight gain in infants and toddlers given the appropriate conditions,⁵⁹ and repeated exposure to sweets and desserts can lead to an established preference for these foods, and an eating pattern in which they're incorporated, as it's been found that certain food preferences are determined early in life.⁶⁰

Portion Sizes

Parents and caregivers have been found to feed their infants and toddlers over-sized portions, and to increase these portion sizes with age.⁶¹ The 2002 FITS found that both infants and toddlers were fed larger than recommended portion sizes of cereals, fruits, and vegetables.⁶¹ Infants, ages 4-5 and 6-8 months, were fed dry cereal in amounts that exceeded the recommended portion size by 50% and 70%, respectively. In addition to cereals, fruits and vegetables, toddlers were also found to over-consume milk, and 50-90% of toddlers exceeded their recommended intake of breads and grains, in larger than recommended portions.⁶¹ The relationship between portion size and child weight status is often described indirectly through the parameter of energy intake,^{62,63} as high energy diets among children are shown to be associated with childhood overweight and obesity.⁶⁴ However, several large-scale studies have found that portion size is significantly and positively associated with child weight status.⁶⁵⁻⁶⁷

Juice Consumption

Fruit juices contribute extra calories to the diets of infants and toddlers.^{68,69} The AAP recommends that children aged 1 to 6 years drink no more than four to six ounces of juice per day.⁷⁰ While NHANES data has found that toddlers generally consume within the recommended amount, the survey also found that toddlers of low-income households are more likely to consume juice [and SSBs] than their higher-income counterparts.⁷¹ Infants, however, should receive no fruit juice before 1 year, as it may displace their main source of nutrition.⁷² For all age groups, the 2015 Dietary Guidelines recommend choosing whole fruit before fruit juice if possible.⁷³

Sugar-Sweetened Beverage (SSBs) Consumption

Use of SSBs can often lead to caloric overconsumption among infants and toddlers.⁴² In 2011-2014, nearly two-thirds of boys and girls consumed at least one SSB per day.⁷⁴ Similar to juice, excessive intake of sugar-sweetened beverages (SSBs) is a major contributor of extra sugars and calories in their diets.⁷³ This category includes soft drinks, fruit drinks, fruit juice, and energy and vitamin water drinks.^{75,76} Sugar-sweetened beverage consumption is found to be strongly correlated with increases in weight gain and higher risk of overweight and obesity in young children.⁷⁵⁻⁷⁸ It's also found that a reduction in sugar-sweetened beverage intake leads to a lower increase in BMI in toddlers,⁷⁵ and has beneficial effects on weight in school-aged children.⁷⁷ In an effort to reduce overall added sugars, the 2015 Dietary Guidelines recommend maintaining calorie intake from added sugars below 10% of the overall diet for children ages 2 years and older.⁷³

Restrictive Feeding

Restrictive feeding has also been found to be positively associated with greater weight status and increased weight gain.⁸¹⁻⁸³ Parental restrictive feeding practices are those that limit or withhold child access to certain foods, typically highly appetizing snack foods that are often high in sugar, fat and overall energy,^{84,85} that increase the likelihood of childhood overweight and obesity.^{82,86} Restriction has been found to lead to increased preference and consumption of these fatty and sugary snacks, even in the absence of hunger.^{81,82,84,85}

Food as Rewards

Similarly, using food as a reward and/or to appease the child has also been found to increase a child's preference for high fat and/or sugary snack foods.⁸⁷⁻⁹⁰ Parent use of foods in these ways has been linked to development of obesogenic eating behaviors among children and increased BMI over time.^{89,90}

Pressure to Eat

A shift to high energy intake and low diet quality is sometimes even found in children who are pressured to eat by parents, often times seen with parents of children who are underweight or picky eaters.^{81,83} Additionally, one study found that parental pressure to eat resulted in children consuming moderately to substantially more than they might have without being prompted,⁹¹ thus increasing caloric intake. This aligns with the finding that children of parents who exert more control over their food intake showed decreased abilities to compensate food volume for caloric density, which was also found to be associated with higher fat stores in children.⁹² While

a direct causal relationship between pressuring a child to eat and obesity has not been established in the literature, increased energy intake among children has been found to be associated with child overweight and obesity,⁶⁴ and the developed preference for high-calorie low-nutrient foods may increase the risk of overweight and obesity by increasing the likelihood of fatty and sugary food overconsumption.^{81,86,93}

Encouraging the child to eat when he/she is not hungry has also been found to impact child weight status and/or behaviors associated with childhood overweight or obesity (i.e. prolonged eating time and increased calorie intake) in several small-scale studies.⁹⁴⁻⁹⁶

Empty Calorie Foods

In addition to providing excess calories, increased intake of empty calorie foods may lead to overweight or obesity by displacing the intake of healthier foods, such as fruits and vegetables.⁸⁶ In 2008, the FITS found that intake of sweet and salty snacks increased with age.⁵⁷ Among toddlers aged 21-24 months, nearly 68% consumed sweet snacks and 24% consumed salty snacks. Additionally, French fries/other fried potatoes were consumed among nearly 14%-18% of toddlers, ages 1-2 years.⁵⁷ While children aged 1 to 3 years typically consume the recommended 1 cup of fruit per day, 85-95% of children in this age group do not meet their daily recommendations for vegetables (i.e., 1 cup).⁹⁷ Although the association between fruit and vegetable intake and weight status is unclear, researchers have suggested that establishing healthy habits may improve weight in childhood and more likely later in life.⁹⁸

Feeding children empty calorie foods, giving infants and toddlers too much milk/formula, the early introduction of solid foods, the use of SSBs, and offering children large portion sizes all contribute to excess calorie intake, or overfeeding.^{39,42,43,63,86} Overfeeding causes children to consume energy in excess of their daily requirements, which has been shown to lead to weight gain.^{59,64,86}

Two U.S. Federal Nutrition Education Programs that Aim to Decrease Childhood Obesity

WIC (and WIC Nutritionists)

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) is a USDA Food and Nutrition Service (FNS) program.⁹⁹ WIC supplies states with Federal grants strictly for food supplementation, nutrition education and healthcare referrals for low-income pregnant and postpartum mothers, and infants and children up to age 5 years who are at nutritional risk.⁹⁹ WIC services are offered in 1,900 local agencies located in 50 states, 34 Indian Tribal Organizations, the District of Columbia and 5 territories (Northern Mariana, American Samoa, Guam, Puerto Rico, and the Virgin Islands).⁹⁹ WIC participation in 2014 consisted of nearly 2.2 million women and just over 7.1 million infants and children.¹⁰⁰ In 2012, most mothers (85.9%) were between the ages of 18 and 34 years.¹⁰¹ WIC nutrition education is primarily offered through face-to-face, telephone or videoconferencing one-on-one sessions, or group education. Technological means, such as kiosks located onsite, tablets or online education, as well as worksheets, are also used. The one-on-one and group education events are typically

taught by registered dietitians, non-licensed degreed nutritionists, trained nutrition paraprofessionals, or breastfeeding peer counselors.¹⁰²

New Jersey's 17 local WIC agencies serve approximately 2% of the national WIC population in 2014 and 2015.^{99,100} The participants served were primarily Hispanic and non-Hispanic black and white participants.¹⁰³⁻¹⁰⁵ From 2008 through 2012, New Jersey has served 61-65% white participants and 25-27% black participants annually. Additional races reached include American Indian (3.2-3.8%), Asian (2.9-3%), Hawaiian/Pacific Islander (1.4-3%) and multiple-race (2-2.3%). Ethnicities of participants ranged from 51-54% Hispanic and 46-49% non-Hispanic.¹⁰³⁻¹⁰⁵

According to NJ State WIC's 2016 Strategic Plan indicates that obesity prevention is a prime objective to be reached through the promotion of physical activity and nutrition education.¹⁰⁶

Supplemental Nutrition Assistance Program-Education (SNAP-Ed)

The other program associated with this research that addresses childhood obesity is Supplemental Nutrition Assistance Program-Education (SNAP-Ed). Section 241 of the Healthy, Hunger-Free Kids Act of 2010 allows for States to implement SNAP-Ed nutrition education and obesity prevention grant programs through the U.S. Department of Agriculture agency Food and Nutrition Services.⁶ This program aims to better the health of participants by improving their nutrition and physical activity habits.¹⁰⁷ New Jersey SNAP-Ed provides evidence-based nutrition and physical activity education to SNAP-eligible, or low-income, children, teens, adults, and seniors using mini-lessons, food demonstrations, workshops, class series, and online resources. Through partnerships with local agencies and programs, NJ SNAP-Ed delivers content in various

locations such as places of worship, food pantries, soup kitchens, schools, low-income housing, farmer's markets, and more.¹⁰⁸

Methodological Research Considerations Pertinent to this Investigation

Qualitative Data Collection

Qualitative research is a field of inquiry that aims to gain a deeper understanding of various phenomenon through information and perspectives gathered through people.¹⁰⁹⁻¹¹¹ It is typically used to explore topics that are not entirely understood, and to identify patterns in collected data that may make connections between what is known and what is unknown.¹¹² This field is flexible in nature, allowing for the narrowing or expansion of research questions and topics throughout the entire process.¹¹³⁻¹¹⁶ Qualitative data collection methods can be grouped into three categories: indirect observations, direct observations and elicitation techniques.¹¹⁷ Indirect observations generally involve examination of material objects or visual data; reviewing of archival material; and/or secondary analysis of previous research.^{110,112,117} Direct observations engage the researcher in observation of the participant firsthand by becoming a part of the participant's life for a temporary time. Elicitation methods include processes of extraction, such as interviews and focus groups.^{110,112,117} This investigation made use of the interview method, as it is considered the most reactive technique of data collection.¹¹⁷ Of the various interview types (unstructured, semi-structured, and structured),¹¹⁷ the semi-structured format was used in this investigation.

Semi-structured, Open-ended Interviews

Interviews are done as a partnership between the interviewer and interviewee, in which both parties work together to enable the researcher to extract useful knowledge through conversation.^{110,113} The interviewer's role is typically restricted to question-asking and listening, while the interviewee contributes most of the verbal content.^{112,113} Semi-structured, open-ended interviews are used to facilitate exploration, rather than the evidence gathering seen in structured approaches.^{109,117} They explore specific subject areas, rather than a broader scope seen in unstructured approaches.¹⁰⁹ These interviews consist of a combination of structured and unstructured formatting. The structure lies within the questions and topics that must be covered, while the unstructured nature allows for modification, at the researcher's discretion, of the phrasing and sequencing of the set of questions asked and the freedom of response of the interviewee.^{109,117} Semi-structured, open-ended interviews also incorporate follow-up questions, or probes. Researchers use probes to ensure the exhaustion of each discussion topic so that all possible related information is offered by the participant.^{109,117} While some probing questions can be pre-planned, many are generated during the course of the interview in response to what the subject has recently shared. The art of probing lies in encouraging the participant to share more without prompting or leading in any direction. This can be done through silence/waiting, or echoing or affirming what has been said.^{109,117}

Qualitative Data Analysis

Qualitative data analysis can be done a number of ways. The most widely-used methods involve a similar set of steps including reviewing, segmenting and reassembling the data.¹¹² Becoming completely familiar with the data is always the initial and most crucial step in qualitative

analysis, as it makes the subsequent steps much easier to conduct.^{109,111,115} Interpretation is reliant on data segmentation through the process of coding. Coding is the identification and grouping of referential words and phrases into meaningful constructs. It is an iterative process that accounts for a large portion of qualitative data analysis and will vary in purpose as the analysis progresses.^{111,112,115} Steps include:

1. Open coding: Open coding is often the preliminary mode of coding in which the researcher breaks down and compares data, so that a code, or a meaningful word or phrase can be assigned to represent the concept portrayed by a line, passage, or paragraph in the data set. Similar concepts found elsewhere in the data should receive the same code.^{111,112,115}
2. Axial coding: Axial coding often follows or intertwines with open coding. Axial coding aims to recognize codes that can be collapsed and codes that can be grouped together under distinctive broader names, creating categories and subcategories.^{111,112,115}
3. Selective coding: Selective coding is the final coding process that seeks to identify recurring themes and core messages communicated by the study participants.¹¹²

As a result of these processes, the once “messy” data has been taken apart and reassembled in a way that is meaningful to the research being done.

Literature Review Conclusion

Childhood obesity is an issue that spans across the nation and across income levels, most severely impacting children from lower-income households. New Jersey has been one of the leading states with the highest rates of obesity among WIC-enrolled children. Numerous child feeding practices have been flagged in the literature as potentially obesogenic, ranging from

practices that provide excess calories to practices that involve inappropriate methods of offering food to the infant or toddler. Policies have been put into place to combat the rise in childhood obesity at the community level. This qualitative research was designed to support the development of relevant community-level interventions that aim to address common feeding practices that may lead to childhood obesity.

CHAPTER 3: METHODS

Again, the purpose of this research project was to identify the child feeding behaviors employed by low-income, diverse parents and caregivers in New Jersey that may lead to childhood obesity among infants and toddlers such that the information gathered could be used to support the development of evidence-based nutrition education materials. The following section describes the procedures followed by the research team, and the data analysis methods used to accomplish the project aim. The interview protocol used had previously been successfully piloted with 12 WIC staff at three locations in New Jersey, by another graduate student. As a result, the protocol described below was adopted for this investigation, and the pilot data previously obtained was added to the data collected in this investigation for analysis.

Recruitment

NJ SNAP-Ed administrators contacted the NJ WIC state office to facilitate the planning process of the project, in which this graduate student was actively involved. Between March and November of 2016, a total of seven meetings and conference calls were held between NJ SNAP-Ed and NJ WIC staff, at either the WIC State office located in Trenton, NJ or the NJ SNAP-Ed State office located in New Brunswick, NJ. During the first meeting, NJ SNAP-Ed representatives, including the author of this paper, the director of SNAP-Ed/faculty advisor, and 3 NJ SNAP-Ed supervisors, reviewed the proposed timeline of data collection with NJ WIC state representatives, which included the NJ Department of Health WIC Director, the Coordinator of NJ Department of Health & Senior Services, and the NJ Department of Health Fruit and Vegetable Nutrition Coordinator. The indicated preferred endpoint of interviews was June 30, 2016. WIC State representatives invited SNAP-Ed to attend their upcoming regional meeting to

present the project to all WIC supervisors. Local-level WIC staff attended the meeting. While participation in the project was voluntary, almost all attending supervisors were enthusiastic about helping with the research and worked with the graduate student to schedule interviews, immediately. In addition to inviting SNAP-Ed to attend the meeting, WIC state representatives sent SNAP-Ed telephone contact information for local agencies.

A convenience sample of WIC staff members were recruited from eight New Jersey agencies, in Essex, Gloucester, Hudson, Mercer, Monmouth, Passaic, Somerset, Sussex, Union, and Warren Counties. Two of these agencies in Hudson and Warren counties had been visited during the pilot project, however, interviews were scheduled with staff who had not previously been interviewed. All WIC staff recruited were those who worked one-on-one with enrolled parents and caregivers and delivered nutrition education as nutritionists, peer educators, or breastfeeding counselors. Interviews were conducted between April 29, 2016 and June 28, 2016.

The Interview Guide

The interview guide had been developed such that interviews could be completed in 30 to 60 minutes. Semi-structured open-ended interview questions were developed to gather information regarding WIC staff observations about obesity-related child feeding practices of enrolled parents and caregivers (Figure 1).

Figure 1: Interview Guide Questions

Q1: Please describe for me the most common feeding practices you have either seen the mothers and other caregivers you work with do or heard of them doing that you believe may result in childhood obesity?

Q2: Are there some other, less common, practices you've seen or heard of in your work that you think we should know about?

Q3: Based on what you've seen and heard can you describe any of these practices that you believe are particular to participants' demographic characteristics, like their age, religion, race, or community customs?

Q4: What have you observed as the most common misconceptions mothers and caregivers have about child feeding and obesity?

Q5: Are there any pieces of incorrect advice that you commonly hear mothers say their mothers and grandmothers advised them to do?

Q6: Childhood obesity has been in the news in the last couple of years. Have you seen caregivers making any changes that might be due to their heightened awareness of this problem?

Q7: The final thing I want to do is to show you a list of practices we found in the literature that have potentially been linked to childhood obesity. Let me know if it jogs your memory, or prompts you to share any other stories with me.

Questions were structured to be discussed in depth with participants through the usage of probing questions to address areas that the interviewer deemed necessary.

Based on a literature review conducted prior to the development of the interview protocol, a list of feeding practices that may contribute to childhood obesity was developed to be presented at the close of the interview. Participants were presented with the following list of prompts found in **Figure 2**.

Figure 2. Prompts Based on Literature Review Findings

Not breastfeeding
Introduction of solid foods earlier than 4 months or later than 6 months
Putting the child to bed with a bottle
Finish the bottle (baby)/clean the plate(toddler)
Offer the child fatty or sugary foods before 1 year of age (including French fries, candy, cookies, cake, soda, juice drinks)
Overconsumption of sugar sweetened beverages at any age (juice/soda)
Offer the child too many energy dense foods at any age, like sweets and salty snack foods
Offer food when the child is not hungry/using food as a reward (or punishment)
Overly restricting food to the child for any reason
Inadequate fruits and vegetables consumption

Study Protocol

Interviews were scheduled on mutually convenient dates and times with site supervisors and conducted with study participants at their work locations during their regular work hours. All interviews were conducted by the Collaborative Institutional Training Initiative (CITI)-certified graduate student who conducted this research.

Interviews were held face-to-face with one WIC staff member at a time. Prior to beginning each interview, participants gave oral consent, after listening to a statement explaining the nature of the study, the planned usage for the information they provided and their participant rights. Participants separately gave oral consent to allow the researcher to record the interview.

The interview guide) shown above in Figures 1 and 2 were employed, with additional probes used as necessary. No compensation was provided for completion of the interview. At the end of each interview participants were asked if they had anything to add, and were consequently thanked for their participation.

Data Analysis

All interview recordings were transcribed to text by the author of this paper, 5 SNAP-Ed Secretaries and 1 work-study student, all of whom were CITI certified. The author of this paper and faculty advisor then conducted a qualitative data analysis. Interviews were reviewed multiple times to increase familiarity with the data. The research team and one office staff member segmented the data, identifying all relevant mentioned topics and the frequency of occurrence. Codes were identified, after which data was re-reviewed to ensure proper counting

of codes throughout the transcribed text. The research team then examined frequencies of code occurrence, selecting those with highest frequency as most relevant to the population. All codes were then assessed for similarities, and codes of similar nature were combined into themes (e.g., items “finish the bottle” and “clean the plate” both fit within the theme “pressure to eat”).

Computer analyzing software NVIVO was used to ensure accuracy in data analysis.

CHAPTER 4: WIC EDUCATORS' PERCEPTIONS OF INFANT AND CHILD FEEDING PRACTICES THAT MAY LEAD TO CHILDHOOD OBESITY

ABSTRACT

Objective: To identify the infant and toddler feeding practices employed by New Jersey's WIC-enrolled culturally diverse clientele that may lead childhood obesity.

Methods: Semi-structured, open-ended interviews with a convenience sample (n=32) of WIC nutrition educators (nutritionists and breastfeeding counselors) at 8 NJ WIC agencies.

Results: Twenty-two feeding practices were identified and classified into four emergent themes: (1) feeding practices that support excessive energy intake; (2) inappropriate bottle feeding practices; (3) suboptimal food/beverage choice; and (4) instrumental feeding practices (i.e., use of food as a reward or punishment).

Conclusions and Implications: Feeding practices were similar across cultures and suggest the need for caregiver education on previously recognized obesogenic feeding practices as well as infant sucking reflex tendencies and child nutrition supplements.

Key Words: WIC, infant, toddler, obesity, child feeding practices

INTRODUCTION

Low-income U.S. children exhibit higher rates of, and smaller decreases in, obesity prevalence than their higher-income counterparts.¹⁻⁴ Thus, the Healthy Hunger Free Kids Act of 2010 made obesity prevention a foci for Supplemental Nutrition Assistance Program-Education (SNAP-Ed).⁶ From 2000-2010, NJ ranked among the 3 states with the highest obesity rates among WIC

participating children,⁵ and remained far above the national average thereafter.⁵ In response, NJ SNAP-Ed aimed to develop educational materials for WIC-enrolled parents.

This research aimed to identify the obesogenic infant and child feeding behaviors employed by low-income, diverse, NJ parents and caregivers to support the development of these nutrition-education materials. To gain expert input on observed, obesity-related infant and child feeding practices among diverse WIC clientele, interviews were conducted with NJ WIC staff.

METHODS

A qualitative approach was used to conduct and analyze exhaustive, semi-structured open-ended interviews that were structured to gather expert input from WIC staff members about observed infant and child-feeding practices that may lead to childhood obesity. This project protocol was approved by Rutgers University's Institutional Review Board (protocol #14E14-448).

Recruitment

NJ SNAP-Ed representatives (i.e., the manuscript authors) contacted and met with NJ WIC state office staff to facilitate project approval and planning. Between March and November of 2016, 7 such meetings and conference calls were held, after which WIC State representatives invited the SNAP-Ed researchers to attend a regional meeting to present the project to all local-level WIC supervisors. A convenience sample of staff from the 8, of 17, NJ WIC agencies ultimately participated. All worked one-on-one with enrolled parents and caregivers and delivered nutrition education as nutritionists, peer educators, or breastfeeding counselors.

Interview Protocol

An in-depth interview protocol was developed by NJ SNAP-Ed staff to ensure that information provided by WIC experts addressed the specific needs of the target audience and accounted for cultural variations. The interview guide was developed such that interviews could be completed in 30-60 minutes (Figure 1).

Figure 1. Interview guide questions used with WIC staff to acquire their observations of infant and toddler feeding practices that may lead to childhood obesity.

Q1: Please describe for me the most common feeding practices you have either seen the mothers and other caregivers you work with do or heard of them doing that you believe may result in childhood obesity?

Q2: Are there some other, less common, practices you've seen or heard of in your work that you think we should know about?

Q3: Based on what you've seen and heard can you describe any of these practices that you believe are particular to participants' demographic characteristics, like their age, religion, race, or community customs?

Q4: What have you observed as the most common misconceptions mothers and caregivers have about child feeding and obesity?

Q5: Are there any pieces of incorrect advice that you commonly hear mothers say their mothers and grandmothers advised them to do?

Q6: Childhood obesity has been in the news in the last couple of years. Have you seen caregivers making any changes that might be due to their heightened awareness of this problem?

Q7: The final thing I want to do is to show you a list of practices we found in the literature that have potentially been linked to childhood obesity. Let me know if it jogs your memory, or prompts you to share any other stories with me.

A list of obesogenic feeding practices, based on a prior literature review (Figure 2), was presented at the close of each interview to generate additional discussion by jogging the participant's memories regarding any practices she may not have already recalled.

Figure 2. Practices associated with infant and toddler obesity in the literature that were posed as prompts to generate additional information at the end of each interview in which they had gone unmentioned.

Not breastfeeding

Introduction of solid foods earlier than 4 months or later than 6 months

Putting the child to bed with a bottle

Finish the bottle (baby)/clean the plate(toddler)

Offer the child fatty or sugary foods before 1 year of age (including French fries, candy, cookies, cake, soda, juice drinks)

Overconsumption of sugar sweetened beverages at any age (juice/soda)

Offer the child too many energy dense foods at any age, like sweets and salty snack foods

Offer food when the child is not hungry/using food as a reward (or punishment)

Overly restricting food to the child for any reason

Inadequate fruits and vegetables consumption

Data Collection

Face-to-face, tape-recorded, individual interviews were conducted by 2 graduate students and their advisor at participants' worksites during regular work hours. No identifying information was collected from participants and no compensation was provided for study participation. A closing question asking the participant if she had anything to add, concluded each interview.

Data Analysis

The interviews were transcribed, after which the author of this paper and her faculty advisor conducted a qualitative data analysis by segmenting the data, identifying all relevant mentioned topics, and determining their occurrence frequencies. Codes were identified, after which data was re-reviewed, and then assessed for similarities. Codes were then grouped into themes (e.g., items "finish the bottle" and "clean the plate" both fit within the theme "feeding practices that support excessive energy intake"). The researchers selected those with highest frequencies as the most relevant. Computer analyzing software NVIVO was used to ensure the analyses' accuracy.

RESULTS

Data collection took place between December of 2014 and June of 2016. WIC staff members (N=32) were interviewed. Interviews ranged in length from 16-43 minutes.

Participant Characteristics

All participants were female and either Hispanic (37.5%), non-Hispanic white (31.3%), non-Hispanic black (21.8%) or Asian (9.4%). Most had Bachelor's (n=19) or Master's (n=9) degrees; of these, 17% were registered dietitians either in the U.S., Colombia or Peru. Of the 4 educators

interviewed who did not have a college degree, 3 had a high school diploma and 1 had “some college.” Nutrition educators had worked for WIC from 1-30 years (mean = 9.6 ± 8.1 years), and their total years providing nutrition education ranged from 1-37 years (mean = 13.8 ± 11.1 years).

Emergent Themes

From the feeding practices identified (N=22; Table 1), 4 themes emerged: feeding practices that support excessive energy intake; inappropriate bottle feeding practices; suboptimal food/beverage choice; and instrumental feeding practices (i.e., use of food as a reward or punishment).

Table 1. Potentially obesogenic infant and child feeding practices, listed thematically, according to their frequency of identification and denotation of their previous.	
Feeding practices that support excessive energy intake	Suboptimal food/beverage choice
Putting solids in the bottle*	Feeding the child high energy, low nutrient-dense snacks*
Feeding juice and SSBs*	Feeding the child fast foods*
Early introduction of solid foods*	Not breastfeeding*
Feeding the child too frequently*	Feeding the child insufficient amounts of fruits and vegetables*
Feeding too much milk/formula*	
Feeding large portions*	Instrumental Feeding Practices
Encouraging child to finish the bottle/plate*	Giving the child a bottle or food to appease him/her*
Misidentifying hunger cues*	Using food as a reward or punishment*
Encouraging the child to eat when the child is not hungry*	
Feeding fatty or sugary foods before 1 year*	Inappropriate bottle feeding practices
Unnecessarily feeding the child PediaSure	Putting the child to bed with a bottle*
Sweetening foods or beverages*	Prolonged bottle use*
Incorrect formula preparation*	Laissez-faire propping of the bottle for the child instead of holding him/her*
* Previously recognized in the literature as an inappropriate feeding practice associated with childhood obesity	

While the purpose of qualitative data collection is not quantification, it is worth noting that 8 of the practices were mentioned by at least 50% of participants (Table 2).

Table 2. Most frequently mentioned feeding practices (> 50% of participants)
Feeding the child too frequently
Putting solid foods in the infant bottle
Feeding juice and SSBs
Early introduction of solid foods
Feeding the child high energy, low nutrient-dense snacks
Feeding too much milk or formula
Using the bottle or food to appease the child
Using food as a reward or punishment

Feeding practices that support excessive energy intake. The most frequently named feeding practice (> 80% of participants) was putting solid foods in the bottles of infants, sometimes seen with infants as young as 2-weeks old. This was reportedly done to help the infant feel full and/or sleep longer. Premature solid food introduction as early as 2 mo. was also seen with foods such as cereal, mashed vegetables and soups. A common source of excessive energy among children who had transitioned to solids was milk consumption in an amount similar to what they had been drinking prior to the transition. Oversized portions and feeding too frequently were also major issues. Educators emphasized that parents and caregivers had a misconception regarding their children's dietary needs.

They don't realize what a portion size is for a child as opposed to an adult.

Serving juice and sugar-sweetened beverages (SSBs) was also named frequently.

A lot of our moms are not sure how much juice to give. I'd say they're giving more because they're not aware how much is too much. And there's a perception that if it's 100% juice it's good.

I can't tell you how many times I've seen kids that are obese or overweight and the moms say 'but he barely eats'. They are eating maybe twice a day, small portions, but drinking 6 cups of juice a day!

Caregiver encouragement to finish plated foods or to finish the bottle, as well as caregivers' failure to correctly identify hunger and fullness cues was also reported.

A lot of times...they're going 'you didn't finish your...' whether it's vegetables or fruit or rice...so I just think overfeeding in general.

Yeah finish the bottle – we see that a lot. Even when they're here you see the baby is trying to fall asleep, but they're sticking it in their mouth. They want the baby to finish it.

Most of our moms identify—because we have that question in one of our questionnaires, “how do you know when your baby is hungry?” and most moms will say that they cry, or fall off schedule.

Similarly, accounts of caregivers force feeding children were reported.

...the baby was making noise. She was an, I think, older infant. She (the mother) kept trying to give her food. She was almost forcing it on her. I had to even say something because it was bothering me so much. I don't think she is hungry. I think she was just a little agitated.

WIC staff also noted the unnecessary use of PediaSure (e.g., given to children who were thought to not be eating enough, even if they were overweight).

I can't tell you how many clients we have come here, the child overweight, they're asking for PediaSure because the child is not eating. Or they're buying it. Sometimes they're buying it...

The feeding of fatty or sugary foods, like Cheese Doodles, ice cream, candy and fruit snacks, before age 1 was also accounted. Some caregivers also unnecessarily sweetened foods and/or drinks (e.g., cereal with sugar; water with Karo syrup or honey; and milk with chocolate or strawberry flavoring). Clients shared that children wouldn't drink plain water or milk because they didn't like it. Some WIC educators had also observed parents disproportionately mixing formula powder and water, which can impact calorie intake.

Inappropriate bottle feeding practices. Prolonged bottle use was also reported by 50% of participants.

Caretakers think they have to get the majority of their nutrition from whatever is in the bottle. They aren't thinking about meals. Some of them are throwing everything in the bottle because they are on the go and it's a faster means of nutrition.

Laissez-faire bottle propping was also reported as a contributor to high energy intake due to lack of parent responsiveness. A WIC staff member reported seeing babies fall asleep with propped bottles in their mouths and their continuing to receive a formula stream despite signs of satiety. One participant speculated that while many infants use pacifiers at that age, the bottle was also being used as a pacifier.

Putting the child to bed with the bottle, typically containing milk, was also mentioned.

Suboptimal food/beverage choice. Most participants reported seeing parents give their children salty and/or sweet snacks, including: chips, cookies, candy, and fast-food, particularly McDonalds, which was identified as a “go-to” restaurant among their clientele.

Not breastfeeding and discontinued breastfeeding was also discussed.

Sometimes we get them to change their minds to breastfeed... but a lot of them, they do formula exclusively, predominantly.

The mommies that breast feed...we have a low percentage...very low percentage... they try, but they give up very early on because it tends to be a lot of work.

Lack of serving enough fruits and vegetables were also noted.

Instrumental feeding practices. Instrumental feeding is the use of food as a reward or punishment.^{119,120} Instrumental feeding reportedly occurred when caregivers were seeking cooperation or silence. Processed snack foods were identified as preferred instrumental food offerings.

Mom has a crying kid and she wants to talk to me and she's like, "Here have a piece of cookie," or she's like, "have a cracker" or, you know, something like that. And you know, what a lot of moms tell me with that is...the stuff that is already prepackaged is easier to pack—it is easier to give to them...It causes less mess than, you know, grabbing fresh fruits or vegetables.

The baby or toddler hears the mom saying "stop, stop acting up," or "stop running around! Sit down and behave or you're not gonna get McDonalds later," or "you're not going to get your candy or sweets.

Either promising a child candy or actually giving them candy to behave while they're here, for example, when they are being weighed and measured. And often times the ones they are promising this to, and giving this to, are those children who are obese to begin with. So you know that is something of common occurrence within the family, that they are rewarding them with candies, chips...and McDonalds.

Collectively, these findings show multiple accounts of caregivers observed engaging their children in obesogenic feeding practices in the NJ WIC offices.

DISCUSSION

All but one of the 22 feeding practices observed by the WIC staff in this study had previously been identified as inappropriate and associated with infant and toddler overweight in the literature (Table 1). Further, the data suggested that despite the high degree of diversity found among NJ WIC clientele [who identified as Hispanic, White, European (French), Asian (Indian,

Korean, Pakistani, Japanese), Black American, Portuguese, White-Jewish, Haitian, Middle Eastern and African], the potentially obesogenic feeding practices employed by them are quite similar.

Despite the agreement of this study's findings with the literature, there was one practice found in the literature that was not reported in this study: overly restricting food from the child. It is possible that this practice was not observed by WIC staff due to the low-income statuses of WIC-enrolled families. Many studies that did evaluate the impact of food restriction did so among populations containing high percentages of well-educated parents and families with incomes averagely and well above the poverty level.¹²¹⁻¹²⁴

Interestingly, the practice of incorrect formula mixing was found to impact more than infant weight in the literature; this practice was also shown to jeopardize infant health by potentially leading to dehydration, metabolic acidosis and intestinal complications when over concentration occurred.¹²⁵⁻¹²⁸ Intentional dilution of formula, though not reported in this study, has been found to be used by low-income families as a coping mechanism to stretch food to the month.¹²⁹ This practice, however, may be more common among low-income families with fewer resources than those that do not engage in this practice.

One of the more unique findings of this study was the practice of nutritional supplement use to augment children's diets. WIC staff noted that parents, often of overweight children, were feeding their children a nutritional supplement, more specifically PediaSure® because they thought their kids weren't eating enough. This product's website promotes it as a supplement

that is clinically proven to help kids grow and a supplement formulated for kids who are behind on the growth curve.¹³⁰ A small disclaimer is visible on the website stating that this supplement has been studied in children that are at risk of malnutrition, and it has been used as a successful treatment for this condition.^{131,132} These product claims can also be found on the labels of their products, such as their Grow and Gain supplement (75% of their product line).¹³³ Product packaging with health claims, which in this case ensures parents that the nutritional supplement will “help kids grow,” has been shown to significantly influence consumers while they are at the point-of-purchase.¹³⁴⁻¹³⁶

Furthermore, PediaSure’s TV commercials, advertise the supplement as:

- Pediatrician recommended for picky eaters,^{137,138} and
- A supplement that will help children grow and “absorb” the most out of life.¹³⁹

These ads play on parents’ emotions, e.g.:

- The anxiety experienced by parents of picky eaters who struggle to find nutritious foods that their kids will eat;^{137,138}
- Fears that their children are not getting enough nutrients from regular food;¹³⁷⁻¹³⁹ and/or
- Guilt that their children may not reach their full potentials if they are not given a supplement like PediaSure.¹³⁷⁻¹³⁹

Products recognized as being “pediatrician-approved,”^{137,140} also likely generate positive feelings about giving it to their children among parents. In addition, PediaSure ads that don’t target picky

eaters give the impression that any child would benefit from supplementing their diet with this product.¹³⁹

A common finding, both in this study and the literature, is the belief that “a fat baby is a healthy baby.”¹⁴⁵⁻¹⁴⁷ This is significant if one considers that in one study found that only 21% of mothers with children in the highest growth chart quartile identified their children as having excess weight.¹⁴⁸ It is also possible parents’ perceptions of what is and is not overweight influenced PediaSure purchases.

An interesting finding from this study was with regards to laissez-faire propping of bottles for infants and toddlers. One WIC educator made an interesting comment, suggesting that she believed propped bottles were being used as pacifiers, especially as the child was falling asleep. Based on what she had seen, parents in the waiting room would prop their children’s bottles and leave the bottles in that position long past the onset of satiety cues, such as falling asleep. She reported that during this time, the children continued to suck because the bottle was in their mouths. Her speculation was that the sucking motion was soothing, as is the case with a pacifier. This explanation is plausible, given that both the bottle and the pacifier prompt the same reflexes—rooting and sucking,¹⁴⁹ as do other objects placed in the mouth (i.e. fingers and thumbs). Pacifiers, whether they are digits or non-food dispensing objects, offer an opportunity for non-nutritive sucking;¹⁴⁹ however, bottles used for the same purpose could result in caloric overconsumption. One study supports this notion in that an examination of 399 predominantly African-American infants found that pacifier use was significantly associated with lower weight-status among formula-fed infants ages 9 to 15 months.¹⁵⁰ Parents in this study reportedly used the pacifier to facilitate calmness and sleep without the use of frequent feedings. These findings

suggest that if parents are aware that, regardless of satiety, their infants are going to reflexively suck when given oral stimulation they can help prevent unnecessary weight gain by ensuring that excess calories are not available through the use of using non-food dispensing objects.

This study has several limitations. While one of the purposes of this research was to determine if different feeding practices were associated with specific cultures found among WIC's diverse clientele, one potential limitation may be that paraprofessional staff did not identify, and consequently did not report, certain feeding practices as inappropriate because they came similar backgrounds. In addition, convenience sampling was used for study recruitment and results may not reflect the perspectives of the NJ WIC community in its entirety. Lastly, because interviews were conducted during the work day, several WIC educators had time limits on interview length, and may not have contributed to their fullest potentials. Despite these limitations, the literature suggests this study's findings are comprehensive.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This study confirms what has been found in the literature regarding child feeding practices that may lead to obesity. Further research focusing on the determinants of caregivers' feeding practice choices may benefit organizations looking to develop impactful community interventions, as it is recognized that behavior is a complex product multiple individual factors.¹⁵¹ Furthermore, a newly proposed health behavior change model, the Multi-Theory Model, may increase the effectiveness of interventions by addressing constructs that influence both the initiation and maintenance of behavior change.¹⁵²

Secondly, this study has implications for nutrition education directed towards pregnant women and caregivers of infants' and toddlers'. The observed use of bottle propping to sooth children suggests a potential need for maternal education that addresses infant sucking habits and how to properly appease them. Further research is needed to determine the potential need for this specific education outside of NJ's WIC population. With regard to the findings on parental feeding of PediaSure, this study suggests that caregivers may benefit from an education regarding the nutritional profile of and appropriate uses for beverage supplements.

Finally, to date, concerns have been voiced and prevention efforts have been considered regarding the allowable ad content for marketing aimed at children.^{153,154} Also, among the nutrition community, there has been a lot of concern about the content of marketing ads of nutrition supplements.¹⁵⁵ Given the findings of this study, perhaps the contents of ads regarding supplements, such as those described in this manuscript which are directed towards parents, should be regulated by the Federal Trade Commission (FTC) and/or nutrition educators should invest additional efforts in media literacy as it pertains to food and beverage purchases that may impact their children's health. Ads with content such as those discussed in this paper in any event, it would greatly benefit educators to stay abreast of what food marketing is present in the media and of current research to ensure that their lessons are up-to-date and relevant.

CHAPTER 5: CONCLUSIONS

This study aimed to determine child feeding practices that may lead to overweight or obesity within a diverse economically-disadvantaged population. The majority of feeding practices found in this study reinforce what had previously been found in the literature with regard to the practices' being potentially linked to increased child weight status. Along with the implications of the previously recognized child feeding practices, this study uncovered two unique findings that provide opportunities for parent education and future research. First, laissez-faire propping of the bottle, viewed as a sort of pacifier for the infant by one WIC staff member, should be addressed by nutritionists. As stated in the previous chapter, mothers should be educated about the importance of learning their infants' natural reflexes and of non-nutritive ways to pacify infant needs, preventing excess calorie intake. Secondly, feeding the child a nutritional supplement unnecessarily also displays a need for education. Specifically, caregivers would benefit from receiving education on the subject of the contents and intended use of nutritional supplements, as well as what to expect in terms of the marketing ads that they will see.

It may have benefited the research team to sit and observe behaviors in the WIC waiting room prior to compiling the list of practices shown to participants at the close of the interview. While most of the practices mentioned were found in the literature, it is possible that these WIC offices have a culture of some behavioral practices that were not found. And because the interviewed participants were staff from similar cultures, they may not have picked up on all that goes on in the waiting room throughout their work day. In addition, it would have been beneficial to ensure that all WIC supervisors clearly communicated the purpose of the interviews to their staff members prior to scheduled visits. Throughout this study, the research team found that while

some participants were aware and well prepared to discuss feeding practices that they had seen, others did not seem to have been briefed by their supervisors on the purpose of the interview in advance, and therefore did not have time to fully gather their thoughts. However, despite these shortcomings, the information gathered was comprehensive and useful.

In conclusion, this study contributes support of existing literature along with observations and ideas that can be further explored. These findings can be used by both researchers and community health educators to collectively impact the health status of infants, toddlers, and children.

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