

## ABSTRACT

**HOLLAND, MARNA MARAE.** Childcare Providers' Perceptions of Their Influence on Obesity in Early Childhood. (Under the direction of Dr. Robert. D. Mustian.)

The purpose of this study was to investigate childcare providers' perceptions of their influence on young children (defined as infants, toddlers, and preschoolers) being or becoming overweight. Specifically, this research examined childcare providers' roles in providing appropriate meals and snacks, nutrition education, and physical activity, and also modeling behaviors that promote healthy weight, and how and to what extent providers perceived those roles affected the weight of the children in their care.

Data for this study were collected by surveying childcare providers who were enrolled in child development courses at five community colleges in western North Carolina.

The research was guided by the following questions. (1) How do socio-demographic factors of providers affect their perceptions of their influence on obesity in early childhood? (2) How do physical factors of providers affect their perceptions of their influence on obesity in early childhood? (3) How do psychological variables of providers affect their perceptions of their influence on obesity in early childhood? (4) How do organizational factors of providers affect their perceptions of their influence on obesity in early childhood? (5) What are childcare providers' perceptions of their role in the prevention of obesity in early childhood, in regards to providing healthy meals and snacks, promoting appropriate nutrition education, promoting physical activity, and serving as a role model for children in regards to nutrition and physical activity? (6) How much influence do providers perceive that they have in regards to influencing children's weight?

The majority of the 120 respondents were female and Caucasian. The largest percentage of participants were 20 to 29 years of age and had a GED, high school diploma, or some college coursework. Over 90 percent had an annual income of \$30,000 or less.

Data analysis revealed that several variables of providers affect their perceptions of their influence on children's weight. These include ethnic background and attitudes toward the childcare profession (affected perceptions of influence on meals and snacks), self-concept, quality of life, and class size (affected perceptions of influence on nutrition education), and provider activities and tasks during children's outdoor play (affected perceptions of influence on children's physical activity). Physical characteristics of providers, including weight, eating habits and physical activity patterns did not affect their perceived influence on children's weight, and a majority of the participants were healthy role models in regards to eating and physical activity habits. Analysis also revealed that providers place greater emphasis on guiding meals and snacks and physical activity than on nutrition education and that providers perceived their influence to be greatest in the area of physical activity.

**CHILDCARE PROVIDERS' PERCEPTIONS OF THEIR INFLUENCE  
ON OBESITY IN EARLY CHILDHOOD**

by

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## **DEDICATION**

In Honor of My Parents

Jan Williams Holland

and

Skip Holland

and in Memory of My Grandmothers

Bobbie Price Holland

and

Sybil Greene Williams

## **BIOGRAPHY**

Marna M. Holland was born July 11, 1970 in Asheville, North Carolina. She attended the Haywood County Public Schools and graduated from Pisgah Senior High School in 1988. She attended Western Carolina University in Cullowhee, and graduated magna cum laude in 1992 with a Bachelor of Science (B.S.) degree in Clothing, Textiles, and Merchandising and a minor in Journalism.

In June, 1993, she became the Family and Consumer Science Agent with Cooperative Extension in Haywood County. During her employment with Cooperative Extension, she received a Master of Science (M.S.) degree in Home Economics and an Education Specialist (Ed.S.) degree in Two-Year Community College Teaching with a specialization in Home Economics from Western Carolina University. She also became Certified in Family and Consumer Science (CFCS) with the American Association of Family and Consumer Sciences in 1994.

In 1996, she began teaching at Western Carolina University as an adjunct instructor in the Child and Family Studies department. In January, 2005, she left Cooperative Extension for a full-time position with Western Carolina University's Birth-Kindergarten program as an instructor and director of distance education for B-K. In January, 2006, she took a position with Asheville City Schools as coordinator for a new community-based emergent literacy program, Partners for Learning Success. She remains an adjunct faculty member at Western Carolina University and enjoys movies, walking, reading, writing, and playing with her Labrador retriever, Bear.

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## **CHAPTER 1**

### **INTRODUCTION**

#### **Overview of Obesity**

According to the 1999-2000 National Health and Nutrition Examination Survey (NHANES), 64% of adults in the United States are overweight, defined as having a Body Mass Index (BMI) of 25 to 29.9, or are obese, defined as having a BMI of 30 or more (“Defining Overweight,” Centers for Disease Control [CDC], 2004). Between 1991 and 2001, percentages of obese adults have increased in both genders, in all adult age groups (18- >70), in all races and ethnicities, and at all educational levels (“Obesity Trends,” CDC, 2003). In 2001, 21.0% of men of all ages and 20.8% of women of all ages were obese, and 31.1% of African-American adults, 23.7% of Hispanic adults, 19.6% of white adults and 15.7% of adults of other races and ethnicities were obese (“Obesity Trends,” CDC, 2003). The obesity rate for adults with less than a high school diploma was 27.4%, for those with a high school diploma the rate was 23.2%, for those with some college the rate was 21.0%, and for those with college degrees, the rate was 15.7% (“Obesity Trends,” CDC, 2003).

Approximately 15% of children and adolescents in the U.S. are overweight (“Physical Activity and Good Nutrition,” CDC, 2004) which is double the percentage of children who were overweight in the early 1970’s (“Defining Overweight,” CDC, 2004) and triple the prevalence of adolescents who were overweight in the past 20 years (“Overweight in Children and Adolescents,” Surgeon General [SG], n.d.).

In North Carolina, the prevalence of adult obesity (number of obese individuals in the population divided by the total number of individuals in the population) increased from 13.0% in 1991 to 22.4% in 2001 (“Obesity Trends by State,” CDC, 2004). According to

the North Carolina Nutrition and Physical Activity Surveillance System (NC-NPASS, 2003), 15.67% of North Carolina children aged 5-11 were at risk for being overweight ( $\geq 85^{\text{th}}$ - $< 95^{\text{th}}$  percentile) of BMI-for-age and 22.77% were overweight ( $\geq 95^{\text{th}}$  percentile of BMI-for-age).

There can be serious physical and financial consequences to being overweight and obese. A broad range of physical ailments are associated with being overweight and obese in adulthood, including hypertension, high blood cholesterol, type 2 diabetes, coronary heart disease, stroke, gallstones, gout, osteoarthritis, sleep apnea, some types of cancer (breast, prostate, gall bladder, kidney, endometrial, and colon), bladder control problems, and psychological disorders (depression, eating disorders, and lowered self-esteem). Approximately 300,000 deaths each year may be attributed to being overweight and obese individuals increase their risk of premature death by 50 to 100% compared to individuals who are a healthy weight (“Overweight and Obesity: Health Consequences,” SG, n.d.).

Overweight children and adolescents, who often suffer from low self-esteem and depression, perceive social stigma and discrimination as the most direct consequence of their condition (“Overweight in Children and Adolescents, SG, n.d.). In addition to the psychological effects of being overweight in childhood, overweight children are at increased risk for type 2 diabetes, high cholesterol, and high blood pressure. Adolescents who are overweight have a 70% chance of becoming overweight or obese adults (“Overweight in Children and Adolescents,” SG, n.d.).

There are also economic impacts from being overweight or obese. A 2002 study found that being overweight or obese was responsible for 9.1% of medical expenditures for that year which amounted to approximately \$92.6 billion (National Institute for Health [NIH], n.d.). Being overweight or obese has both direct economic costs (such as expenses involving

prevention, diagnosis, and treatment) and indirect costs (such as decreased productivity and activity, absenteeism, and loss of income as a result of premature disability or death).

A complex combination of genetic, metabolic, behavioral, environmental, cultural, and socioeconomic factors contributes to people being overweight and obese (“Overweight and Obesity: At a Glance,” SG, 2004). Genetics are one contributing factor. Genes may predispose an individual to being overweight, but often it is the combination of genes with other factors, such as a sedentary lifestyle and unhealthy eating behaviors, that ultimately cause obesity (“Factors Contributing to Obesity,” CDC, 2003). According to Hill and Trowbridge (1998, p. 571), “Despite obesity having strong genetic determinants, the genetic composition of the population does not change rapidly. Therefore, the large increase in the prevalence of obesity . . . must reflect major changes in non-genetic factors.” The greatest opportunity for preventive action against obesity lies in addressing behavioral factors, specifically lack of physical activity and unhealthy eating behaviors, and environmental factors, such as lack of opportunity for physical activity in the work and school environments, or absence of healthy food choices in school or workplace cafeterias.

The population of the United States has become increasingly sedentary. Lifestyle changes and technology innovations have reduced the physical activity expenditures required to work and play. Physical activity, defined by the CDC (“Factors Contributing to Obesity,” 2003) as “any bodily movement produced by skeletal muscles that results in an expenditure of energy with a range of activities,” has become less prevalent in a society of computers, elevators, remote controls, and other time and energy-saving devices. According to the CDC (“Importance of Physical Activity,” 2004), 50% of adults do not engage in physical activity to a physically beneficial extent and 25% of adults perform no significant physical activity in

their leisure time. Women, older adults, and those with lower income and less education have significantly lower rates of physical activity when compared to other groups (“Importance of Physical Activity,” CDC, 2004). The direct costs of physical inactivity are estimated to be as high as \$24.3 billion each year in the U.S. (“Statistics Related to Overweight, National Institutes of Health [NIH], n.d.).

Children and adolescents are typically not as physically active as they were in the past. According to the CDC (“Physical Activity and Good Nutrition,” 2004), more than a third of students in grades 9-12 do not participate in regular physical activity and enrollment in secondary physical education classes has decreased from 42% in 1991 to 32% in 2001. Many children and adolescents in the U.S. spend much of their leisure time on sedentary activities involving computers, television, and various electronic games. According to the Surgeon General (“Overweight in Children and Adolescents, n.d.), 43% of adolescents watch television for more than two hours each day.

Eating habits have also contributed to Americans being overweight. The proliferation of fast food and soft drink products, along with increasing portion sizes and the trend toward eating meals away from home has resulted in adults, adolescents, and children consuming more calories than their bodies can burn. According to the report, “Awareness and Action: AICR Surveys on Portion Size, Nutrition and Cancer Risk,” by the American Institute for Cancer Research (“Amid Obesity Epidemic,” [AICR], 2003), 69% of Americans reported that they finish their entrees at table-service restaurants “all or most of the time.” The report also found that Americans tend to believe that portions don’t matter: 78% of adults surveyed listed the type of food they consumed as more important to weight loss than the amount of food consumed (“Amid Obesity Epidemic,” AICR, 2003).

Research indicates that there are several factors linked to the development of obesity in early childhood. Gable and Lutz (2000, p. 293) note, “Studies from a variety of disciplines (e.g., pediatric nutrition, epidemiology) demonstrate that childhood obesity is not caused by one thing; rather, obesity results from the interplay of multiple factors.”

Woolston (1987), in a study of the factors present in the onset of obesity in infancy and early childhood, identifies epidemiological and social factors (such as culture and socioeconomic class), familial factors (including the presence of an overweight parent), organic factors (such as Praeder-Willi and Klinefelter Syndromes), and psychogenic factors (such as a breach in caregiver/child attachment and subsequent separation and individuation) as causes of childhood obesity. In a study of the relationship between obesity rates of parents to obesity rates of their children, Garn, Sullivan, and Hawthorne (1989) found that parents of obese children were more likely to be obese than parents of normal-weight children. Studies by Strauss and Knight (1999) and Hediger, Overpeck, Kuczmarski, and Ruan (2001) indicated that maternal obesity was the strongest predictor of childhood obesity, with Strauss and Knight also noting that low socioeconomic status and lack of cognitive stimulation were contributing factors. Dietz (1991) also noted the influence of familial factors in the development of childhood obesity, specifically family size (with larger families having less childhood obesity), age of parents (with older parents having heavier children) and television (with hours of television watched directly linked to the rate of childhood obesity). Studies in several countries have yielded similar results. Takahashi et al. (1999) linked the causes for obesity in three-year-old Japanese children to parental obesity, obesity at birth, lack of physical activity, snacking, and maternal employment outside the home and Locard et al. (1992) found that parental obesity and obesity at birth, snacking, television viewing, and

short sleep duration also contributed to the development of obesity in young French children. Haschke (2003) notes three environmental reasons for childhood obesity: children's physical activity has decreased as a result of family lifestyles that are very busy and highly scheduled but largely sedentary; physically vigorous outdoor play being replaced by indoor, "screen-based" entertainment (such as television, computers and video games); and eating patterns that rely heavily on high-calorie snacking and meals eaten away from home.

### **Definitions for Being Overweight**

Growth charts, which are developed by the CDC, are the source of the statistical definition of obesity for children. According to Ogden, Flegal, Carroll, and Johnson (2002, p. 1729), "Overweight is defined as at or above the 95<sup>th</sup> percentile of body mass index (BMI; calculated as weight in kilograms/pounds divided by the square of height in meters/inches) for age. At risk for overweight is defined as at or above the 85<sup>th</sup> percentile, but less than the 95<sup>th</sup> percentile of BMI for age." This standard applies to persons aged two years and older. The CDC does not use the term "obese" to describe the condition of being overweight for children.

There are no BMI recommendations for infants and toddlers (under two years) because of their rapid physical growth. According to Wishon, Bower, and Eller (1983, p. 21), "An infant's birth weight will probably double by 5 months of age, triple by 1 year, and quadruple by the end of the second year. An infant may grow 10 to 11 inches in length between birth and the first birthday, and another 2 to 3 inches by 18 months."

Although there is no BMI recommendation for children under two years, a weight-for-length recommendation is typically employed to determine if infants and toddlers are overweight,

and “. . . overweight in this age group is defined as at or above the 95<sup>th</sup> percentile of weight for length,” Ogden et al. (2002, p. 1729).

### **Overview of Childcare**

Of the 19.3 million children under five years of age in 1995 in the U.S, 14.4 million were in some type of regular weekly childcare arrangement (Smith, 2000). Of children younger than 5 years, 25.1% were in childcare centers, 23.5% stayed in family childcare homes, 21.5% were cared for by relatives, 22.0% were with parents, 4.9% had in-home caregivers (in which care was provided within the child’s home by a non-relative), and 2.9% were cared for in some other arrangement (CDF, 2001). About 44 percent of children less than 5 years of age were cared for in multiple childcare arrangements (Smith, 2000). For example, a child may divide time spent in care between a grandparent and a childcare center. The average time spent in childcare for preschoolers was 28 hours per week, but for children whose parents worked or were enrolled in school, the average time spent in care increased to 35 hours per week (Smith, 2000).

### **Problem Area**

Young children in the United States are more overweight than ever, paralleling a population-wide obesity trend. The number of overweight children aged two to five has more than doubled since the 1970’s (Nicklas & Johnson, 2004). In North Carolina, the percentage of children aged 2 to 4 years who are overweight ( $\geq 95^{\text{th}}$  percentile on a chart comparing the ration of weight to height) was 14.37% (NC-NPASS, 2003), with slightly more females in that age group being overweight (14.7%) than males (14.0%). In North Carolina, children aged two to four who were Asian or Pacific Islander had the highest rate of being overweight (17.8%) followed by children of unknown race (17.9%), white children

(14.8%), American Indian children (13.5%) and African-American children (13.3%), (NC-PASS, 2003).

Being overweight can have serious physical and psychological consequences for children, such as diabetes, heart disease, sleep apnea, depression, and lowered self-esteem.

Physiological, cultural, and environmental factors contribute to children being overweight. Since some of the contributing factors to being overweight are related to the individual's lifestyle and environment (such as poor diet and lack of physical activity), an examination of the young child's daily life may yield insight into the problem of obesity in early childhood.

The family, particularly parents, is known to influence children's weight. According to Hodges (2003, p. 13), "Parents are likely to be influential in the genesis of early childhood obesity prenatally, genetically, and through familial influences. Further, they supply and shape a majority of the environmental influences for infants and young children." Research indicates that parents, while extremely influential in determining children's weight, are often unable to discern whether their child is overweight. In a 2005 study by Etelson, Brand, Patrick and Shirali, 26% of 83 parents surveyed had overweight children, yet only 10.5% of the parents of overweight children accurately perceived their child's weight, invariably underestimating their child's weight. Heubeck (2004) attributes parental misperceptions about children's weight to differing cultural beliefs of what constitutes a healthy weight, parental denial of the problem, and a societal trend toward viewing obesity as "normal."

While parents are traditionally thought of as the primary gatekeepers of young children's weight and health habits, the typical daily environment of many young children consists of two locations: home and childcare. In 1995, 75% of children less than five years of age were cared for through some kind of childcare arrangement and on average, those children spent

28 hours per week in childcare (Smith, 2000). A typical day in childcare includes activities that directly affect a child's weight; specifically, consumption of meals and snacks, physical activity, and nutrition education. According to Crockett and Sims (1995, p. 241), "Obviously, a child who spends up to 10 hours per day in child care is dependent on that setting for appropriate modeling, education, and a nutritious, developmentally appropriate diet." Through their interactions with children, childcare providers may have opportunities to serve as role models for children by demonstrating appropriate dietary practices and levels of physical activity. Therefore, the childcare provider's influence is important to understanding and combating young children becoming overweight.

This study will investigate and shed light on the following question: Do childcare providers, because of their daily activities and interactions with children, perceive that they have significant influence on the weight of children in the infant, toddler, and preschool years, particularly those children who are overweight?

### **Significance of the Study**

Much of the existing literature investigates the family's role in children being overweight. There has been less study of how childcare providers influence the weight of infants, toddlers, and preschoolers. Haschke (2003, p. 28) notes, "young children dealing with obesity is primarily a parental responsibility, but medical professionals, caregivers, and teachers play important roles." In a study of how maternal employment affects childhood obesity, Anderson, Butcher, and Levine (2003) found that maternal work outside of the home has a significant impact on a child's chance of becoming overweight, with more hours of work per week increasing the child's chance of being overweight. While the authors of the article do not identify childcare specifically as a cause of children of working mothers

becoming overweight, they do recognize that additional research is needed on how the quality of childcare affects children's nutrition and energy expenditures and what opportunities children have for vigorous physical exercise when they are in school or childcare.

There is also research that indicates that similarly to parents of overweight children, childcare providers may not recognize that children are overweight. In a study of how caregivers perceived African-American children's obesity-related health risks, 69% children were classified as "obese" or "super-obese," yet only 44% of the caregivers of those children perceived the children's weight to be a possible health risk (Young Hyman, Herman, Scott, & Schlundt, 2000). Adams, Quinn, and Prince (2005) conducted a study of Native-American caregivers' recognition of childhood overweight. Although 26% of the children were classified as overweight and 19% were at-risk for being overweight, the caregivers indicated that they believed only 15.1% of the children were actually overweight.

As an adult caregiver, childcare providers' influence may extend to aspects of a child's day that affect weight. Meals, snacks, physical activity, and nutrition education are often determined, or at least influenced, by a child's care provider.

Reed and Green (n.d.) note that there are a number of ways that childcare providers can assist children in lowering their risk for becoming overweight, such as providing opportunities for physical activity, providing meals and snacks that are based on the guidelines contained in the Food Guide Pyramid, limiting consumption of sweet beverages (including soft drinks, iced teas, lemonades, and fruit-flavored drinks), and setting an example for children by exhibiting healthy eating and physical activity behaviors.

Responsibilities for monitoring children's nutrient intake and modeling healthy food choices are now often shared by parent and childcare provider (Briley & Roberts-Gray, 1999). According to Nicklas et al. (2001), childcare providers influence children's eating in much the same ways that parents and families do, through availability and accessibility to food, meal structure, food modeling, food socialization practices, and food parenting style. In a 1992 study conducted by Wright and Radliffe, parents of children enrolled in childcare perceived the influence of the care provider on children's food preferences as important, if not more important, than the family's influence. The processes that influence young children's food-related practices, according to Nicklas and Johnson (2004) need additional research:

. . . data on the processes whereby . . . caregivers influenced children's eating habits have not been systematically studied and continue to be poorly understood. More research is needed to identify the circumstances (characteristics of the caregiver, caregiver behavior, and environmental setting) under which alternative food-related parenting styles result in healthier eating habits of children (p. 666).

The impact of physical activity within the childcare environment on young children being overweight also needs additional study. Past research has tended to focus on aspects of children's development other than the physical. As Haschke (2003, p. 32) notes, "Many caregivers might be surprised to learn that experts recommend an increase in physical activity for young children. Most . . . spend much of their day trying to calm children and lessen their activity." According to Poest, Williams, Witt and Atwood (1989, p. 368), "The curriculum of most child care programs emphasizes fine motor skills, social skills and

academic concepts while the daily schedule limits the activity patterns of children . . . The question remains, are preschool children engaging in adequate amounts of vigorous daily physical activity.”

### **Purpose of the Study**

The purpose of this research is to investigate childcare providers’ perceptions of their influence on young children (defined as infants, toddlers, and preschoolers) being or becoming overweight. Specifically, this research will examine childcare providers’ roles in providing appropriate meals and snacks, nutrition education, and physical activity, and also modeling behaviors that promote healthy weight, and how and to what extent providers perceive those roles affect the weight of the children in their care.

### **Statement of the Problem**

The research questions include: How do the socio-demographic variables of age, educational level, gender, ethnic background, and socio-economic status affect providers’ perceptions of their influence on obesity in early childhood? How do physical factors of providers, including weight, eating habits, and physical activity patterns affect providers’ perceptions of their influence on obesity in early childhood? How do psychological factors of providers, including their attitudes toward childcare, self-concept, quality of life, and serving as a role model to children affect their perceptions of their influence on obesity in young children? How do organizational factors, such as tenure, training, size of class, participation in the Child and Adult Care Food Program (CACFP), and facility licensing rating affect providers’ perceptions of their influence on obesity in early childhood?

Also, what are child care providers’ perceptions of their role in the prevention of obesity in early childhood, in regards to: 1) providing healthy meals and snacks 2) providing

appropriate nutrition education 3) promoting physical activity and 4) serving as a role model for children in regards to nutrition and physical activity?

Lastly, how much influence do providers perceive that they have in regards to influencing children's weight?

### **Limitations of the Study**

This study is limited to a convenience sample of childcare providers in Western North Carolina; therefore, the findings cannot be generalized to providers in other locales. Because the community colleges offer many of their early childhood courses in an internet-based format, a majority of the surveys will be completed online. With this method of data collection, the researcher will not be readily available to answer or clarify questions, which could affect responses. The survey asks respondents to self-report on their personal weight, activity patterns, and food consumption habits, so there is potential for subjectivity. Another possible limitation of the study is that each of the five community colleges may not have equal participation in the study.

## **CHAPTER 2**

### **LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

#### **Rates and Potential Effects of Being Overweight in Early Childhood**

Rates of children being overweight are increasing, including those of infants, toddlers and preschoolers. Data collected from the NHANES IV (1999-2000) indicated that 11.4% of children ages birth to 23 months and 10.4% of children aged 2 to 5 were overweight and that 20.6% of children aged 2 to 5 were overweight or at risk of being overweight (Ogden et al., 2002).

Rates of infants and toddlers (6 to 23 months of age) being overweight were 7.2% in 1980 when the NHANES II was completed, increased to 8.9% on the NHANES III in 1994, and increased again to 11.6% on the NHANES IV in 2000. Six- to 23 month-old children were not included on the NHANES I in 1974 (Ogden et al., 2002).

The percentages of children aged 2 to 5 who are overweight has also increased. In 1974 (NHANES I) and again in 1980 (NHANES II), 5.0% of all 2- to 5-year-olds were overweight. This increased to 7.2% on the NHANES III in 1994, and increased again on the 2000 NHANES to 10.4% (Ogden et al., 2002).

There are ethnic and gender differences in preschool age obesity rates. The NHANES IV (2000) indicated that Mexican-American children, aged 2 to 5, had an obesity rate of 11.1%, compared to 10.1% for white 2-to 5-year-olds, and 8.4% for African-American 2- to-5-year olds. Female children aged 2 to 5 had an obesity rate of 11.0%, while males of the same age had a 9.9% rate (Ogden et al., 2002).

Overweight children may suffer weight-related physical complications, such as asthma, type 2 diabetes, hypertension, orthopedic complications, and sleep apnea (AOA, 2002).

Psychological effects of being overweight for children may include low self-esteem, negative body image, obsessions with food and dieting, feelings of failure, and a damaged adult/child relationship caused by struggles over food (Berman & Fromer, 1997).

Childhood obesity is linked to adolescent and adult obesity. According to Smith (n.d.), approximately one-third of obese preschool children and about half of obese school-age children grow into obese adults. Several of the nation's leading causes of death, including heart disease, some cancers, stroke, and diabetes are related to being overweight and obese. Poor diet and physical activity are listed by the CDC (2000) as the second most common actual cause of mortality, affecting over 15% of all deaths in the United States.

## **Childcare**

### **Types of Childcare Programs**

Young children in the United States are cared for in a variety of settings. Some children are cared for in unregulated settings (such as care provided by a relative or nanny). Burton et al. (2002) estimates that there are 2.3 million paid caregivers in the national child care workforce at any given time, with an additional 2.4 million unpaid individuals (most of which are relatives) providing care to young children in a given week.

Family childcare providers care for children who are unrelated to them in the provider's home. This type of care is particularly attractive to parents of very young children, as the number of children who attend childcare homes is relatively small. Most family childcare home providers operate as small businesses, with the provider as the sole proprietor. Regulations differ from state to state, but generally, the family childcare home industry is less regulated than childcare centers. The average size of a family childcare home is 6

children and family childcare homes have a childcare market share of 28% (Neugebauer, 1999).

Some centers are part of a for-profit chain. There are fewer than 10 chains in the United States who operate more than 100 centers, and most are corporations. A for-profit chain center serves an average of 125 children and its market share of the childcare industry is 7% (Neugebauer, 1999).

Independent, for profit centers are operated by individuals or partnerships. These “mom and pop” centers serve an average of 70 children and make up 18% of the childcare market share. Independent, for profit centers make up the largest portion of childcare centers (Neugebauer, 1999).

Independent, non-profit centers are typically operated by community centers or by agencies whose mission is to serve low-income families. The average size of an independent, non-profit center is 70 children. Independent, non-profit centers comprise 15% of the childcare market share (Neugebauer, 1999).

Church-housed centers often operate as a community service. Some receive financial assistance from the church but others have a “tenant” relationship with the church and pay all of their own operating expenses. The average size of a church-housed center is 65 children and church-housed centers possess 9% of the childcare market (Neugebauer, 1999).

Head Start centers are funded directly by the federal government and operated locally by community action agencies or school boards. With a few exceptions, Head Start serves 3- and 4-year olds on a part-day, part-year schedule. The average size of a Head Start center is 55 children, with a 5% share of the childcare market (Neugebauer, 1999).

Public school preschools are usually operated as classrooms in elementary schools. A few are housed separately from schools and operate independently from school systems. Public school preschool is a growing segment of the childcare industry. Unlike other childcare programs, public school preschool is sometimes exempt from licensing and regulation. The average public school preschool serves 60 children and the market share is currently quite small, about 4% (Neugebauer, 1999).

There are other non-profit centers operated by community organizations such as YMCAs, colleges and universities, and health care facilities. The childcare center may have a separate mission from the agency operating it or its operation may share the agency's mission. Centers of this type also comprise a small share of the childcare industry (4%) and serve an average of 65 children per center (Neugebauer, 1999).

The remaining 10% of the childcare industry market is comprised of other childcare arrangements that are not classified. An example of an unclassified childcare establishment would be a company or corporation-owned childcare center that operates as a benefit to its employees or a business-owned childcare establishment that offers childcare for its patrons, such as is sometimes found at gyms and casinos.

### **Childcare in the United States**

Of the approximately 2.5 million people paid to care for children ages birth to five in the United States (excluding kindergartens), about 24% work in childcare centers, 28% provide care in family childcare homes, 35% are paid relatives of the children, and 13% are non-relatives who are paid. Forty-nine percent of paid adults are caring for toddlers, 29% are caring for infants, and 22% are caring for preschoolers (Burton et al., 2002). The annual staff

turnover rate in centers is approximately 19%. Family childcare providers have an annual turnover rate of 17% (Burton et al., 2002).

Approximately \$38 billion is spent annually in the U.S. on regulated childcare (*National Economic Impacts of the Child Care Sector*, National Child Care Association [NCCA], 2002). More than 900,000 individuals are directly employed in the regulated childcare employment sector, which is greater than the farming, fishing, and forestry sector (460,700) or the accounting and auditing sector (863,320) (*National Economic Impacts of the Child Care Sector*, NCCA, 2002).

### **Characteristics of the National Childcare Workforce**

In 2002, approximately 1.2 million jobs were held by childcare workers in the U.S. (*Occupational Outlook Handbook*, U.S. Department of Labor [USDOL]), 2004), with many of those positions part-time and, approximately 2 of 5 childcare workers self-employed as family childcare providers. The median hourly wage for childcare workers in 2002 was \$7.86 (*Occupational Outlook Handbook*, USDOL, 2004).

The childcare workforce is predominantly female. According to a 1994 study by Burton, Whitebook and Satai (cited in Burton et al., 2002), 99% of family childcare providers and 97% of center staff (Helburn, ed., 1995, cited in Burton et al., 2002) were women.

In a 1990 study, 34% of center-based staff were 19-25 years of age, 17% were 26-30 years of age, and 34% were ages 31-50. The remaining 14% were 18 years and younger and 51 years and older (Whitebook, Howes and Phillips, 1990, cited in Burton et al., 2002). Of family childcare providers, 8% were 20-29 years of age, 33% were 30-39 years of age, 44% were 40-54 years of age, and 15% were 55 years of age and older (Alameda Health Alliance, 1997, cited in Burton et al., 2002). Approximately 40% of childcare providers have children

(“Profile of the Child Care Work Force,” *Child Care Bulletin*, 1997, cited in *National Economic Impacts of the Child Care Sector*, NCCA, 2002).

According to Helburn’s 1995 study (as cited in Burton et al., 2002) 16% of center-based teaching staffs were African American, 3% were Asian American, 70% were Caucasian, and 11% were Latino. In their 1992 study, Kontos, Howes, Shinn, and Galinsky (cited in Burton et al., 2002) found that 17% of family childcare providers were African-American, 71% were Caucasian, 5% were Latino, and 7% were Asian-American or another ethnicity.

In childcare centers, directors had attained the most formal education. Sixty-nine percent of center directors had a bachelor’s degree or higher, 27% had some college (including associate’s degrees) and 4% had a high school diploma or less. Of teachers in childcare centers, 33% had a bachelor’s degree or higher, 47% had some college or an associate’s degree, and 20% had received a high school diploma or less. Family childcare providers had less formal education: 17% had a bachelor’s degree or higher, 38% had some college, and 44% had a high school diploma or less (Kontos et al. 1992, cited in Burton et al. 2002).

### **Childcare in North Carolina**

In 2003, there were 3,964 licensed childcare centers in North Carolina, serving 147,090 children aged birth through five, and 5,062 licensed family childcare homes, serving 16,158 children ages birth through five. Approximately 25% of all children in North Carolina under age five are enrolled in either a regulated childcare center or a regulated childcare home (*Early Childhood Needs and Resources Report*, 2003).

Of centers in North Carolina, 60% are for-profit; 16% are non-profit, church operated; 11% are non-profit, independent operated; 9% are non-profit, government operated; 1% are

industry operated (for employees); and 3% are operated under some other auspices (Russell, Lyons, Grigoriuc, & Lowman, 2002).

Since 2000, the North Carolina Division of Child Development has employed a “star-rating” system to evaluate the quality of childcare centers and childcare homes. This program is based on points earned in three areas: program standards, staff education, and compliance history with childcare regulations. Participating childcare facilities earn one (low) to five (high) stars, based on their scores in the three areas. In 2003, 63% of childcare centers had attained three or more stars and were considered “quality” centers and 28% attained four or five stars and were considered “higher quality” centers. Of the regulated childcare homes in North Carolina, 41% had attained a three-star or higher rating and 18% had four or five stars for a “higher quality” rating (*Early Childhood Needs and Resources Report*, 2003).

According to Traill & Wohl (2004), annual receipts for the childcare industry in North Carolina total \$1.5 billion, making it an industry comparable in size to the tobacco and hospitality (hotel/motel) industries, and larger than the telecommunications and scientific research and development industries.

The childcare industry directly supports more than 46,000 employees in North Carolina (Traill & Wohl, 2004), with more people working in childcare in North Carolina than in telecommunications (24,345), hospitality accommodations (38,530) or as public elementary school teachers (43,190). According to the U.S. Census Bureau’s *Occupation Projections: North Carolina 2000* childcare is expected to be one of the top ten fastest occupational growth areas in North Carolina based on growth of the industry and demographic and economic trends.

Childcare providers comprise the largest group of self-employed workers in the state (Traill & Wohl, 2004) and many of the small businesses in North Carolina are childcare establishments. According to data from the North Carolina Division of Child Development, at any given time the childcare industry in North Carolina is capable of serving 337,000 children, which is 24% of all children in the state ages birth through twelve years.

The childcare industry in North Carolina faces many challenges. The average wage for a childcare worker in the state is less than \$15,000 a year (*North Carolina Occupational Employment and Wages*, 2003) and less than 14% of childcare establishments offer employer-paid health benefits, with 29% of childcare providers receiving no health benefits (Russell, Lyons, Schwab, & Smith, 2004). This has resulted in an unstable workforce with high turnover: approximately 20% of childcare workers in centers in North Carolina indicated they would leave their present position within three years (Traill & Wohl, 2004).

Two other challenges for the childcare industry are affordability and accessibility. Over 126,000 families in North Carolina have children under age six in some type of regulated childcare arrangement (Traill & Wohl, 2004). According to the childcare market rate survey, the cost to care for an infant and four-year-old at a center would cost approximately \$13,000 in the 15 urban counties and over \$9,000 in the 85 rural counties (N.C. Division of Child Development Market Rate Survey, 2004). For many families earning low-wages, childcare costs take up an inordinate amount of their income. According to Traill & Wohl (2004), for a two-parent family with the median income of a rural county, childcare costs for an infant and preschool-age child would equal about 19% of the family's income.

## **Characteristics of the North Carolina Childcare Workforce**

In North Carolina in 2002, the median hourly wage was \$11.00 for center directors and \$7.50 for center directors. Family childcare providers earned a median hourly wage of \$5.57 (Russell et al. 2002).

Twenty-seven percent (27%) of center-based teachers and 28% of family childcare providers had no health insurance. Thirty-four percent (34%) of center-based teachers reported needing public assistance of some kind, as did 21% of family childcare providers. Forty-six percent (46%) of center-based teachers reported living in a household with annual earnings of less than \$20,000 (Russell, et al. 2002).

Nearly all childcare workers in North Carolina are female: 98% of center directors, 99% of center-based teachers, and 99% of family childcare home providers in 2002 were women (Russell et al. 2002).

The median age for center directors was 43 and the median age for center-based teachers was 32 in North Carolina. Forty-two was the median age for family childcare home providers (Russell et al. 2002).

Ninety-five percent (95%) of family childcare home providers have children of their own. Eighty-seven percent (87%) of center directors were parents, as were 71% of center-based teachers. Twenty-two percent (22%) of center-based teachers were single parents, as were 12% of family childcare providers and 9% of center directors (Russell, et al. 2002).

Most childcare workers in North Carolina in 2002 were white (60% of center directors, 53% of center-based teachers, and 39% of family child care providers) or African-American (36% of center directors, 41% of center-based teachers, and 56% of family child care providers). Four percent (4%) of center directors, 6% of center-based teachers and 5% of

family childcare providers were Latino, American Indian, or another ethnicity (Russell, et al. 2002).

Many people in the childcare workforce have engaged in some form of professional development. Sixty-four percent (64%) of center directors, 54% of center-based teachers, and 44% of family child care providers have attained the N.C Early Childhood Credential which is offered by the 58 community colleges in North Carolina and consists of two early childhood curriculum credit courses (*N.C. Early Childhood & Administration Credentials*, N.C. Division of Child Development [NCDLCD], 2004). Seventy percent (70%) of center directors had received the N.C. Administration Credential (Russell, et al. 2002) which is also taught through the 58 community colleges in North Carolina and has three required components for successful completion: coursework in administration, coursework in child development and early education, and completion of a professional portfolio (*N.C. Early Childhood & Administration Credentials*, NCDLCD, 2004).

In addition to credentialing, a majority of North Carolina's childcare workforce has pursued education beyond the high school level. Of center directors, 32% had a bachelor's degree or higher, 16% had an associate's degree, and 49% had a high school diploma with additional college coursework. Twelve percent (12%) of center-based teachers had a bachelor's degree, 10% had an associate's degree, and 60% had pursued college coursework beyond high school. Ten percent (10%) of family childcare providers had a bachelor's degree, 10% had an associate's degree, and 53% had pursued college coursework beyond high school.

Despite low wages, 80% of center-based teachers and 92% of family childcare providers reported being "satisfied" or "very satisfied" with their jobs. Although large percentages of

childcare workers in North Carolina report satisfaction with their positions, 25% of center-based teachers and 16% of family childcare providers report that they expect to leave the childcare profession within the next three years. Teachers with the most and least levels of education and teachers who were paid the least were more likely to report they plan to leave childcare than other teachers (Russell, et al. 2002).

### **Areas in Which Providers Influence Young Children's Weight**

Childcare providers have the potential to influence overweight rates in young children in several ways. Childcare providers interact with children and families on a daily basis, preparing meals and snacks, providing opportunities for nutrition education and physical activity, and serving as a healthful role model. There is potential for tremendous caregiver influence on a child's lifelong health habits, a topic that continues to need additional study. Crockett and Sims (1995, p. 241) note, “. . . a child who spends up to 10 hours per day in child care is dependent on that setting for appropriate modeling, education, and a nutritious, developmentally appropriate, and adequate diet.”

### **Meals and Snacks in Childcare**

Meals and snacks provide daily nutrition for young children and are essential to their growth and development. Between 2.5 million and 5 million young children eat at least one meal a day while in childcare (Briley, 1990). Childcare facilities should serve meals and snacks that supply nutrients in proportion to the amount of the day the child is in the facility's care. For example, a child who spends eight or more hours a day in child-care would need to receive one-half to two-thirds of their daily nutritional needs at child-care (Briley & Roberts-Gray, 1999).

## **Developmental Perspectives on Children's Eating Patterns**

In the period between birth and five years of age, children move from a diet composed exclusively of milk to a menu that includes the six food groups and will sustain them, with minor modifications, throughout the life cycle. The road to mature eating is often rocky. Infants sometimes suffer from colic and chronic spitting up, babies may go on food jags, toddlers frequently test limits at mealtimes and habitually reject new foods, and preschoolers are often finicky and struggle to feed themselves without messiness. These behaviors, while often frustrating to adults, are part of children's dietary development.

Birch (1979) investigated the relationship between preschool children's food preferences and their food consumption patterns and found that familiarity with food was important to children's preference: it was the most important dimension of preference for three-year-olds and was second only to food sweetness for four-year-olds. The researcher noted that often preschool children's food preferences are measured by consumption data or from maternal reports, but that children readily identify their food preferences and dislikes and are the most direct source of information about their food preferences.

Beyer and Morris (1974) studied the evolution of 44 children's food preferences as preschoolers and as school-agers and found a great deal of similarity at both developmental stages. Both preschoolers and school-age children preferred meat over other foods and both ages disliked cooked vegetables. There were some differences, however. Preschool children ate more snacks than older children and often depended on those snacks to fulfill their daily protein and caloric needs. Preschoolers also tended to accept combination dishes less often than did elementary school-age children.

Satter (1987) notes that young children's eating patterns are affected by their temperaments, individual hunger thresholds, personal love of eating and food preferences, tempo (speed) of consuming food, feeding capability, individual difficulties with learning to eat, and other miscellaneous "glitches" and variables. One variable that affects the food consumption and nutritional patterns of children is participation in a childcare program.

### **Factors Influencing the Menus at Childcare Facilities**

Many factors affect the menus at childcare centers. Briley, Roberts-Gray, and Simpson (1994) visited nine childcare centers in an attempt to identify how foods are selected for menus. They found that menu history, program requirements, staff knowledge, mission of the facility, costs of food and its preparation, staff perceptions of children's food preferences, culture, and convenience were the major determinants of what children in childcare consumed for meals and snacks. In this study, the researchers found that menus were rarely changed and when change did occur it was often a reaction to a new regulation or directive. Licensing and Child and Care Food Program (CACFP) requirements also affected menus, as did staff knowledge of child nutrition. The study notes, "Although staff did not believe their knowledge limited their ability to meet the children's needs, lack of knowledge did influence the foods that children were served," (p. 279). The study found that childcare facilities primarily operate under one of three missions (to promote the development and well being of children, to provide a community service, or to provide a wage to the center's employees) and that the mission often determined if food was viewed as a part of a schedule or as an activity similar to bathroom time: "the focus [of eating] is on meeting immediate comfort needs rather than on long-term health consequences or opportunities for learning," (p. 280). Costs of food and its preparation were also factors. The researchers reported that center

directors said that cost was not a concern, but actions the center took, such as tearing napkins into pieces to be divided between children and using chipped and worn food containers, indicated otherwise. Staff perceptions of children's food preferences and dislikes also influenced menus. In some cases, the staff reported perceptions that did not coincide with the researchers' observations. For example, the staff reported that the children preferred food seasoned with lard, margarine, or bacon, but observation indicated that children showed no visible preference for food cooked in fat over food with no added fatty seasonings. In regards to culture, the study found that childcare menus were largely consistent in their content, regardless of the surrounding region's culture. The researchers did note, however, the presence of a different type of cultural influence:

“Every center served spaghetti, fish sticks, hot dogs, potato chips, and cookies. It appears that there is a ‘kid culture’ or a ‘child care culture’ that may mitigate the effects that local culture has on the menus at the child care center,” (p. 280). Finally, convenience of preparation was a factor in menu determination. There was frequent use of canned and frozen foods, and in one case, reluctance to add appropriate, lower-fat milk for older children because “it would require extra bookkeeping,” (p. 280). Prepared foods, which are often higher in calories but are easier to prepare, are frequently used in childcare menus because “child care staff do not have time, energy, or expertise to fully prepare foods themselves,” (Haschke, 2003, p. 32).

Haschke (2003, p. 32) relates an anecdote to illustrate how lack of nutritional knowledge can affect the foods that are served in childcare:

In a recent nutrition education workshop, a cook at a child care center said she didn't fry any foods that were served to the children. When participants were asked later

to list the favorite foods served to children in their centers, the same individual volunteered 'steak fingers.' When the workshop leader pointed out this was a fried food, she replied. 'I didn't fry the meat. I just warmed it in the oven.' She didn't realize that the prepared steak fingers had been previously fried.

### **Evaluation of Nutritional Quality of Childcare Menus**

Guidelines and recommendations from a number of sources have been established to assist childcare providers in planning nutritious meals and snacks, including the federal Child and Adult Care Food Program (CACFP), the USDA Food Guide Pyramid and Dietary Guidelines for Children, and the American Dietetic Association's position paper that focuses on nutrition standards for childcare. Despite these resources, a number of studies indicate that meals and snacks served in childcare often fall short of providing ideal nutrition for young children, and while clinical malnutrition is rare in preschool children in the United States, many children's diets lack in quality or quantity (Briley & Roberts-Gray, 1994).

Hayden (2002) notes that the improving the nutritional quality of meals served in childcare is dependent on the level of knowledge of adults who are responsible for feeding children. An example of the influence of nutritional knowledge on menu, says Hayden, is the deficiency of vitamin A that is present in many parts of the world despite ready availability of fruits and vegetables rich in vitamin A in those areas. The answers to nutritional problems in early childhood, concludes Hayden, are much more complex than simply increasing availability of foods and are largely tied to adult involvement: "Knowledge about food values, skills to select and prepare foods, and the facilitation of attitudes which support healthy eating and living habits are the weapons for improving nutrition . . . (p. 40).

Briley, Jastrow, Vickers, and Roberts-Gray (1999) conducted a study of how foods served at children's homes nutritionally complemented foods served at childcare. They found that foods served at childcare supplied adequate vitamin C, vitamin A, niacin, riboflavin, thiamin and calcium, but failed to contain enough energy, iron, and zinc. The study also indicated that children did not consume enough servings of vegetables or foods from the bread, cereal, rice and pasta groups. The researchers concluded that the childcare feeding environment is an opportunity to increase children's intake of iron and zinc. Iron is of particular importance for young children as iron deficiency anemia is the most common nutritional problem for this age group (Duyff, 2002).

Bruening, Gilbride, Passannante, and McClowery (1999) studied the impact of the Child and Adult Care Food Program (CACFP) on the diet and health of 40 children at two urban childcare centers. One center participated in the CACFP while at the other center children brought their food for snacks and meals from home. Children who were served the CACFP-approved meals had higher daily intake of vitamin A, riboflavin, and calcium and consumed more milk and vegetables and fewer fats and sweets. Weight-for-height measurements did not differ for the two groups, but children who ate CACFP meals had fewer days of sickness than did children from the center that used foods brought from children's homes.

In a study of five-day lunch menus at 92 licensed childcare centers in Mississippi, Oakley, Bomba, Knight, and Byrd (1995) found several areas of concern, including high levels of fat and sodium and insufficient amounts of energy, vitamin B12, vitamin E, calcium, iron, and zinc. Strengths of the menus were that most centers had sufficient amounts of protein, riboflavin, vitamin D, vitamin K and potassium. The researchers recommended additional research into the menu planning process at childcare centers, training for childcare workers in

menu planning and nutrition, and specific menu planning guidelines that ensure that common nutritional deficiencies are corrected.

A 1993 seven-state study that analyzed the menus at 171 childcare centers was conducted by Briley, Roberts-Gray and Rowe. Their research indicated that childcare menus, regardless of geographic location or population served (income and ethnicity), were quite consistent in their food patterns and strengths and weaknesses. They found that protein, vitamin A, vitamin C, vitamin B12 and riboflavin were provided in adequate amounts in the menus, but that appropriate amounts of niacin, iron, and calories were often lacking. An examination of the menus indicated that the most frequently served foods in the centers were milk, bread, apple, orange, crackers, cheese, beef, cookies and cereal. Each of those foods appeared on menus an average of three times within 10 days. There were no vegetables that appeared three times in a 10-day menu cycle and potato was the sole vegetable that was served twice within 10 days. Both cruciferous and leafy green vegetables appeared infrequently, if at all, on the menus.

The researchers concluded that nutritional strengths of the menus were they were typically rich in vitamin A and vitamin C, that they used sugars in moderation, and that smoked, salted and nitrate cured foods were served infrequently. Nutritional weaknesses of the childcare menus were that they did not include a variety of foods, they did not contribute adequately to a child's daily niacin and iron, they did not provide adequate calories to help children maintain a desirable weight, they provided combinations of foods that took more than 30% of their calories from fat, and they did not present enough vegetables, especially cruciferous vegetables.

Drake (1992) collected 10-day menus from 46 childcare facilities in Missouri and analyzed them for nutrition. While calcium, thiamin, vitamin C, riboflavin, and niacin were provided at 91% or above of the recommended amounts, the menus lacked sufficient amounts of energy, iron, zinc, magnesium, vitamin A, and folic acid. These nutrients were found in amounts at 75% or less of the standard. A study of the foods that were served indicated that green leafy vegetables (a significant source of iron, magnesium, vitamin A and folic acid) were served infrequently or not at all, while hot dogs and luncheon meats, which are low in iron and zinc appeared frequently on the menus.

A second part of Drake's study measured the nutrition knowledge of menu planners in childcare centers. Most of the respondents (88%) understood why it was important to serve a variety of foods. Ninety-two percent (92%) could name dietary sources of protein and 88% knew dietary sources of carbohydrates. Ninety-two percent identified milk consumption with adequate intake of calcium, but only 36% also identified milk as a source of vitamin D. A lack of knowledge about appropriate serving sizes for children was also indicated: 32% correctly responded to a question about serving sizes of vegetables.

McNicol and Kaplan (1991) studied the food consumption of preschool-age males in 22 childcare centers. Dietary intake was evaluated for nutritional content, representation of food groups, and frequency of food consumption on a 10-day menu cycle. They found that the most frequently served fruits were apples, bananas and oranges and the most frequently served cooked vegetable was corn, followed by peas and carrots. The study also indicated that the meals were nutritionally adequate for the portion of the day the children were in the childcare facility, but that the menus often lacked variety, creativity, and multicultural foods and that often there was over-consumption of fats, salt, processed meats, and desserts.

In a study of 10-day cycle menus at 40 childcare facilities in Texas, Briley, Buller, Roberts-Gray and Sparkman (1989) found that meats and vegetables were served with appropriate frequency, but that a variety of fruit was not present. Some centers served only one fruit during the week, which was usually limited to an apple, a peach or an orange. Breads and cereals and dairy products varied in how frequently they were served and how much variety was present in their presentation. In regards to portions, the study found that often children are served in amounts that are not adequate to meet their nutritional needs. In 70% of the participating facilities, at least one component of the lunch menu was not served in an adequate portion. The researchers suggest that in addition to the findings of other studies that indicate that menus are often deficient in iron, menus may not reveal a deficiency in calories that results from insufficient portions. The researchers theorized that because providers often observe young children not eating all of the food on their plates, they serve less than the requirement in an effort to eliminate wasting food. This practice can result in hungry children who may be malnourished or may eat too much later in the day to make-up for their hunger, which can eventually contribute to being overweight.

The nutrition knowledge, attitudes and menu planning skills of 29 family childcare home providers indicated that although providers were generally knowledgeable about menu planning, the menus lacked sufficient amounts of iron and calories to meet the nutritional needs of preschool children. Most providers were able to correctly answer questions about food groups, healthy snack choices, food safety, and sources of specific nutrients, such as ascorbic acid and calcium. However, providers struggled with identifying sources of energy, with more than 50% indicating they believed vitamins to be a source of energy instead of fats. The menus' strengths were variety of meats and vegetables, contrasts in color, texture,

temperature and flavors, and little use of fats, oils, and sweets. Unanimously, providers indicated positive attitudes about nutrition. All of the participants agreed or strongly agreed that nutrition is important to growth and health, that dietary sources of iron and ascorbic acid should be served daily, that providers should be knowledgeable about nutrition, that children should be encouraged to taste new foods, and that menus should not be limited to only those foods that providers know children will accept (Briley, Coyle, Roberts-Gray, & Sparkman, 1989).

### **Recommendations for Menus in Childcare**

A review of the research on menu planning in childcare facilities reveals several issues surrounding meal and snack consumption in the childcare setting. Two consistent findings are that menus do not supply adequate amounts of iron and energy (calories) to meet the needs of young children. Other frequently cited nutritional concerns were lack of adequate amounts of zinc and niacin. Studies also repeatedly indicated that childcare menus rarely offered sufficient variety in the foods served, there was a lack of incorporation of multicultural foods into the menus, and often foods were not served in adequate portions for the growth, development, and energy needs of children. In several cases, vegetable and bread and grain consumption was not found to be adequate, while over-consumption of fats, sweets and sodium were frequent concerns.

In addressing these concerns, Briley, McBride, and Roberts-Gray (1997) suggest that childcare facilities use carefully selected cold cereals more often. Cereals are fortified with a variety of vitamins and minerals, which could increase children's intake of iron and niacin with a low-fat, high-energy, high-fiber food source. A 1999 study by Briley, Jastrow, Vickers and Roberts-Gray also advocated using fortified ready-to-eat cereals in place of

crackers and cookies and as a late-day snack because childcare menus that incorporated cereal at least four times in 10 days had significantly more niacin, riboflavin, iron and zinc than menus with less cereal.

Berman and Fromer (1997) note that there are many sources of iron available to menu planners in childcare, including sources from the meat and protein group (dried beans and peas, peanut butter, meats), the vegetable group (asparagus, lima beans, beets), the fruit group (dried apples, canned apricots, canned cherries, dates, and figs), and the bread and grain group (enriched and whole-grain products). Briley, McBride and Roberts-Gray (1997) also advocated adding dried beans (such as navy, black-eyed, or red beans) to the menu to increase iron and complex carbohydrates and suggest that childcare facilities enroll in a food bank such as Second Harvest to increase nutrition quality affordably.

In addressing the issue of providing sufficient calories to children in childcare, Satter (1987) suggests that at least part of the problem is timing and that a snack late in the day would be beneficial in sustaining children's energy and fighting hunger:

Day care providers could do parents a big favor by having substantial afternoon snacks, and by having them rather late. Most children leave day care positively ravenous and unable to wait for dinner. They have a snack when they get home, and are so hungry they can't stand to have something small. They eat so much they spoil their appetite for dinner. (p. 100)

In discussing ways to add variety to meals and snacks in childcare, Berman and Fromer (1997) advocate using the food groups as a guide, browsing through cookbooks for inspiration, trying a new or ethnic restaurant, or looking for different produce at the grocery store. They also note that vegetarian entrees can be substituted for meat dishes, salads can be

made to be a main dish, and that there are many sources of protein besides meat, such as dried beans, peas, lentils, peanut butter and eggs.

Meals and snacks are important to a child's development. A variety of foods, served in appropriate portions in pleasant environments, contribute to a healthy relationship between children and food. Inadequate portions, over-consumption of calories from fat, and under-consumption of certain nutrients contribute to both malnutrition and children becoming overweight.

### **Nutrition Education in Childcare**

The American Dietetic Association's position paper "Nutrition Standards for Child-Care Programs" states: "Every child should have opportunities to learn about food, food sources, nutrition, and the link between nutrition and health," (Briley & Roberts-Gray, 1999, p. 984).

The paper specifically recommends that effective nutrition for young children include integrating menus with nutrition education, involving parents and families in nutrition education activities, and providing food experiences for children that are developmentally appropriate and emphasize life skills. According to Levy and Cooper (1999, p. 235B), "Reaching young children with . . . nutrition education programs can promote better eating habits. Preschool children are an excellent audience due to their readiness to learn and potential for change. Their natural curiosity in food and their bodies can lead to formation of lifelong food habits, preferences, and attitudes."

### **Nutrition Education at Mealtimes**

According to Briley and Roberts-Gray, "The menu at a child care facility can be used as a centerpiece of nutrition education programs that reinforce healthful food habits at the child

care facility and at home. Food experiences are vital to helping children to recognize and accept a wide variety of foods,” (1999, p. 984).

In a study of 24 childcare programs, Nahikian-Nelms (1997) found that while 83% of providers who were surveyed believed mealtimes to be an opportunity for incorporating nutrition education, only 50% of those providers mentioned nutrition to the children during mealtime observations. Further, nutrition education typically consisted of identifying foods and their origins (plant or animal).

In a study of children’s nutrition socialization experiences conducted with Head Start teachers, Gable and Lutz (2001) also found that most of the teacher-led mealtime nutrition education consisted of naming foods, with less emphasis on mealtime conversation and tasting different foods. While naming foods helps children identify food items, Gable and Lutz suggest that meal time activities that encourage sorting and classifying foods presents a more developmentally appropriate challenge for preschool-age children.

### **The Family/Childcare Connection to Nutrition Education**

Home and childcare environments influence children’s eating patterns and nutritional learning. Crockett and Sims (1995, p. 235) note, “Parents-especially mothers-who were once the primary teachers of sound eating practices for their children now face stiff competition in this role from the media and child care providers.”

Research indicates that parents remain the primary influence on children’s eating patterns and preferences. Yperman and Vermeersch (1979) found that parental attitudes affect children’s acceptance of unfamiliar foods at school. Children’s nutrition knowledge was positively correlated to the number and nature of parental messages to children about nutrition (Anliker, Laus, Samonds, & Beal, 1990), and Oliveria et al. (1992) found a positive

correlation between the nutritional intake of parents, especially mothers, and their children. Gable and Lutz (2001) found childhood obesity was linked to inappropriate mealtime and feeding practices in the home, such as insisting that children produce a “clean plate” and rushing them through meals.

In a study of how parents perceived the influence of the childcare environment on their children’s food behavior, Wright and Radcliffe (1992) found that generally, parents perceived the home environment as most important in the development of children’s eating habits. For example, 54% of the parents believed that the home environment was most responsible for learning about new foods. However, parents also recognized the influence of the childcare environment on children’s eating: 41% of the parents believed that the home and childcare environments were equally influential in determining specific food children liked and 37% indicated that there was equal influence of the two environments on food dislikes. Also, 33% of the parents indicated a belief that the childcare and home environments were equally responsible for the development of table manners and eating skills. Forty-one percent (41%) of parents perceived the childcare environment as having the most influence on children learning to classify foods.

Since both the home and childcare environments influence children’s food practices and preferences early in life, a coordinated approach between home and child-care is most effective for ensuring children develop healthy eating habits. According to Briley and Roberts-Gray (1999, p. 984), “To the extent possible, parents should be engaged in helping to plan and implement the nutrition education component of the child-care program.” However, studies by Wright and Radcliffe (1992) and Briley, Jastrow, Vickers and Roberts-Gray

(1999) indicate that parents typically have low, if any, involvement in childcare nutritional practices.

Koblinsky, Guthrie, and Lynch (1992) studied the effects of a parent nutrition education program on the nutrition-related behavior of the parents and on the food consumption patterns of their children. Parents who received the treatment (weekly nutrition newsletters and four nutrition workshops) reported making more healthy changes in meal planning, food selection, food preparation, and cooking than did the control group who did not receive the newsletters and workshops. The researchers concluded that parental nutrition education can have positive impacts on family nutrition behaviors and can lead to a healthier diet for preschool children. One way to potentially increase family involvement, say Briley and Roberts-Gray (1999, p. 985) is to post menus where they are accessible to parents, and to ensure that “special efforts be made to get parents involved so they can make informed decisions about what foods and nutrition learning experiences to offer during the child’s hours away from the child care facility.”

Berman and Fromer (1997) suggest that families can increase their involvement in childcare nutrition programs by assisting with development of nutrition policies, participating in planning menus, assisting with preparing meals, contributing favorite recipes, chaperoning food-related field trips, cooking with groups of children, and conferencing with providers about feeding issues.

According to Evers (1995) families can complement and participate in their children’s nutrition education by planting a small garden, reading books to children with nutrition themes, or turning grocery or market shopping trips into learning experiences. Allowing and encouraging children’s help in the kitchen with food preparation is one of the most effective

ways to teach about nutrition and food. Many nutrition activities used in the childcare setting can be adapted and extended by families.

Families can be of particular help in providing cultural enrichment to food and nutrition programs. According to Derman-Sparks (1992), the family is the appropriate context to explore culture with preschoolers. Families can provide culturally representative recipes or props to the center and be a source of cultural folklore, which Hertzler (1990) calls “advantageous” for teaching nutrition to preschoolers. Cronin and Jones (1999) describe how important representations from children’s home cultures are in the dramatic play area of a childcare facility: “For some families from the Caribbean, a coffee strainer is a necessary piece of [kitchen] equipment; in a Vietnamese child’s kitchen, a wok may be the first necessity of cooking. And who wants to serve breakfast cereal out of unfamiliar labels, when cereal boxes are among children’s first reading experiences?”

### **Developmentally Appropriate Nutrition Education for Young Children**

The American Dietetic Association’s position on nutrition standards for childcare programs (Briley & Roberts-Gray, 1999, p. 985) states “Nutrition education activities should be offered at appropriate developmental levels for learning and muscular activity, be based on meanings familiar to the families and the children, and teach lifetime skills for problem solving and making decisions and taking responsibility.” In addition to these criteria, says Cason (2001), effective nutrition education for young children should be “. . . behavior change oriented, activity based and learner centered and must employ social and developmental learning strategies,” (p. 161).

Haschke (2003, p. 32) notes that nutrition education may take place at the dinner table. Children, like many adults, often have “portion distortion” with “caregivers report[ing] that

children are now requesting third, fourth, and fifth servings of specific foods.” Haschke advocates that providers educate children at the table about practices such as eating slower and developing mealtime conversation, which “help children learn to regulate their food intake and recognize the sensation of feeling full,” (p. 32).

Appropriate food handling and cooking experiences for young children enable them to use their developing motor skills to pour, mix, scrub, spread, peel, roll, shake, measure, and wrap foods. Hertzler (1989, 100B) notes, “Food handling skills need to be tailored to the level of muscular development of the preschooler. Food handling teaches preschoolers lifetime skills on taking responsibility, figuring things out, making decisions, and getting along with others . . . preschoolers are [also] learning vocabulary . . . and gaining valuable skills in making food choices and in learning to prepare meals.”

Contento (1981) conducted a Piagetian-based study in which children ages 5 to 11 were interviewed on their ideas about food and eating. Based on their understanding of two Piagetian tasks, conservation and classification, 80% of the five-year-olds were considered “preoperational.” At the preoperational stage (between the ages of approximately 18 months and six years) several distinct cognitive characteristics are evident. According to Mooney, “During the preoperational stage, children are egocentric (think of everything only as it relates to them), can focus on only one characteristic of a thing or a person at a time (for example, take words at their exact meaning), gather information from what they experience rather than from what they are told, and overgeneralize from their experience,” (2000, p. 69). Contento found that preoperational children viewed vitamins as pills that people took to be stronger and healthier. None of the preoperational children linked vitamins to food consumption. Preoperational children also did not understand the process of change that

food goes through in the body. Their answers indicated that they believed that food goes to the stomach and stays there in an unchanged state. Preoperational children displayed a vague belief that fruits, vegetables, and milk were “good for them, but they had no idea why,” (p. S89). Contento suggests that the nature of nutrition education is often abstract and that as “pre-operators” children are not cognitively ready to make connections between nutrition and food, yet many nutrition curricula for young children deal extensively with nutrients. Contento concludes that because preoperational children cannot conserve (understand that food is transformed in the body) and cannot classify by hierarchy (such as understanding that vitamins are contained in foods), nutrition education is often presented at developmentally inappropriate levels. “Focusing on nutrients, the nutritional effects of foods, or even food groupings which are based on nutrients seems to be an inappropriate basis, therefore, for teaching children of this age about foods and nutrition,” (p. S89).

Lytle et al. (1997) studied how children interpret and use nutrition messages. Focus groups and interviews were used to assess 141 children in kindergarten to sixth grades on their understanding of the Dietary Guidelines for Americans, the Food Guide Pyramid, and food labels. Their findings, similar to Contento’s 1981 study, indicated that most young children did not understand the concepts of “variety” and “healthy weight.” Younger children also struggled to identify high-fat foods, as many appeared to consider them to be synonymous with all snacks. The study also indicated that most of the younger children did not understand the concept of serving size and how to determine the number of servings they should consume. The researchers concluded:

In order to translate nutritional messages into information that is meaningful and useful to children, educators must strive to keep the messages as simple, positive,

and behaviorally-oriented as possible. Our messages must be tailored to be developmentally appropriate for children; a message that is scientifically correct but too complicated for children to understand will not be effective. Our messages need to be positive so that our children can enjoy eating and develop healthy attitudes and behaviors around eating. Eating pattern messages for children must be specific to influence healthy food choices (p. 135).

Lee, Schanveltdt, and Sorenson (1984) investigated how preschool children learn nutrition concepts in the home and early childhood laboratory environments. They concluded that nutrition education can be effective with young children in home and preschool settings, providing that the material and concepts are developmentally appropriate. Their research indicated that children are capable of more than merely increasing food acceptance and learning about new foods to understanding basic nutritive value, nutrient function, and the connection of nutrition to health.

In a study of the health and food-related perceptions of children ages 4 to 7 years, Singleton, Achterberg and Shannon (1992) found that children did see a connection between food and health and that “young children possess the ability to comprehend at least some abstract concepts related to food, eating behavior, and health,” (p. 70). Specifically, children seemed to have a basic understanding of energy, the relationship of excess fat intake to health, and eating foods that support bone strength and the immune system. The authors conclude that “the ability of preschool children to understand nutrition and health curriculums should not be underestimated, although more research is needed to determine the appropriate level for most children,” (p. 70).

In a study of the effects of nutrition education on the food and nutrition knowledge of preschool children, Gorelick and Clark (1985) found that three-to five-year old children were competent in matching activities involving food but struggled with tasks that required classification skills. They also found that children showed significant increases in identification of foods and their ability to select “good for you” foods following participation in the nutrition activities and concluded that developmentally appropriate nutrition education can have a positive effect on children’s nutrition knowledge.

Murphy, Youatt, Hoerr, Sawyer and Andrews (1995) interviewed 62 kindergarten students to evaluate their understanding of the concepts and terminology of the USDA Dietary Guidelines for Americans and to determine if their food choices were consistent with their nutrition knowledge. When asked “What do you think nutrition means?” most of the children responded with a developmentally appropriate definition of “eating food that is healthful or good for you” (p. 220). Most of the children also understood the concept of “variety” although they did not know the term and demonstrated some knowledge about nutrients and functions of food groups. Children recognized the relationship between consuming too much food and added body weight and were able to identify high-fat foods. The children were able to classify foods in terms of “liked” and “disliked” and also in terms of foods high in fat, sugar and salt. They struggled, however, when they were asked to classify foods according to their source (plant or animal).

The study also investigated kindergarteners’ feelings and perceptions of being overweight. When asked how people became overweight, children identified “too much food, candy, ‘junk’ food, fat, snacks, hamburgers, fat from chicken chocolate chips, turkey, meat, and

‘fattening’ foods” (p. 221). When asked about the consequences of being overweight, the children responded with answers related to social effects, physical discomfort and health. Displaying egocentric thinking, the children had difficulty with understanding why being overweight would be a problem for anyone other than themselves: “Kindergarteners did not care if others were too fat, but they did not want to be overweight themselves,” (p. 221).

Kindergarteners’ snack choices were not consistent with their knowledge of basic nutrition. When asked to name their favorite foods, the most popular items were pizza, macaroni and cheese, meat, and eggs. The most disliked foods were tomatoes, olives, mushrooms, broccoli, brussel sprouts and potatoes (p. 222). Children indicated an awareness of certain foods being high in fat and that they thought they should consume those foods less frequently, but fatty and sugary foods were the most popular.

The authors conclude “Nutrition education cannot be delayed until children can understand the full message. Instead, nutrition education can begin with children as early as preschool and kindergarten with an emphasis on basic principles, an introduction to nutrition terms, and positive experiences with healthful foods,” (p. 223).

### **Appropriate Methodologies for Teaching Nutrition to Young Children**

Hertzler (1990, p. 43) notes that while preschool-level nutrition education has evolved from a “show and tell” mentality to programs with more complexity and emphasis on behavioral change, there is still a need for “develop[ing] classroom materials and activities that include problem-solving skills . . . [to] assist students in analyzing, synthesizing, and evaluating food-and nutrition-related decisions. . .”.

Drake (1992) advocates tasting sessions and simple food preparation activities as appropriate nutrition education for preschoolers. Fuhr and Barclay (1998, p. 79) suggest that cooking experiences and using real food with children are developmentally appropriate: “To learn about nutrition, children must be involved with actual food and not simply answer questions in workbooks, sing songs about vegetables, or color fruits and vegetables in a coloring book.” The value of cooking activities for children, according to Rothlein (1989), is that cooking imparts knowledge, such as where food originates and what foods different cultures eat, and develops skills, such as pouring, measuring, counting, describing, and following instructions.

In a study of nutrition education in elementary schools, Zemel, Brokaw, Huntsinger, and McMichael (1993) found that 75% of the surveyed teachers made their own nutrition education materials. Forty-two percent (42%) used materials made by other teachers. Most of the surveyed teachers showed interest in learning more about nutrition education: 42% said they were “very interested” and 38% were “somewhat interested” in access to training and materials. Teachers were most likely to incorporate nutrition into their health units (97%) but many also included nutritional topics in science (78%) and language arts (61%). Subjects less likely to have a nutrition component were reading, art, math, and social studies. This study, while conducted in elementary school, has implications for early childhood educators, many of who construct materials for their classrooms and integrate nutrition into multiple areas of their curriculum.

Cason (2001) studied the effects of using multiple intelligences teaching strategies on the learning of preschool-age children about nutrition. In the study, a nutrition curriculum was used with 3-year-old and 5-year-old children which incorporated a variety of activities that

were identified with the different categories of intelligence. Some of the activities included stories, cassettes, videos, cooking, field trips, games, posters, discussions, tasting parties, songs, puzzles, art projects, role playing, skits, and puppets. Post-testing indicated that young children are capable of naming different foods and placing them in the appropriate food group. Children were also able to distinguish healthy snack choices and displayed an increased readiness to try unfamiliar foods.

The effects of two teaching strategies (benefit appeal and threat appeal) on the nutrition knowledge, attitudes and food behavior of 103 preschool children was studied by Lawatsch (1990). Three fairy tales were rewritten to emphasize nutrition concepts. The benefit appeal fairy tales presented the positive results of eating vegetables, while the threat appeal fairy tales conveyed the health and nutrition risks of avoiding vegetables. Children were assigned to either the benefit group, the threat group, or a control group that did not hear the fairy tales. A flannel board was used with the experimental groups to relate the fairy tales. In post-tests, benefits appeal appeared to be most effective. Children who heard the benefits appeal fairy tales scored higher on nutrition knowledge than the other two groups. Both interventions appeared somewhat effective, however: the children in the threats appeal group, though they did not score as highly as the benefits appeal group, did score higher than the control group. This study supports the recommendation of Lytle et al. (1997) that nutrition education be positive in nature so that it helps children develop healthy eating habits and attitudes and encourages them to enjoy eating.

## **Childcare Provider Attitudes and Knowledge of Nutrition Education**

The American Dietetic Association states, “Those engaged in direct caregiving should be informed about the basic principles of infant and child nutrition [and] strategies for creating a positive environment that promotes the development of good eating habits

. . .” (Briley & Roberts-Gray, 1999, p. 985). The authors further state that as research on children’s nutritional needs and best feeding practices evolves, childcare providers need opportunities to receive current, credible information and training in childhood nutrition.

Gillis and Sabry (1980) surveyed preschool teachers at 34 childcare centers to measure their knowledge and opinions of the importance of nutrition and food practices related to feeding young children and their use of food in learning activities. Of a possible score of 20 on the nutrition knowledge test, the mean score for the 120 teachers was 10.9 +/-3.1. On the teacher opinion survey, the mean score was 36+/- 5, with teachers between 24 and 34 years of age having more positive opinions about nutrition than older and younger teachers. In regards to food practices in the childcare facility, most teachers indicated that they viewed snack time as a relaxing, social time for the children to take in nutrition. Most teachers indicated they did not use food to reward or pacify children and most teachers reported letting children determine their own portion sizes. The three most frequently checked learning activities related to food and nutrition were food-source discussions, sensory-oriented exploration of foods, and fine-motor food activities, such as peeling carrots. Teachers indicated they “seldom” or “occasionally” involved children in preparing snacks, tasting and story activities related to food, and visiting farms or markets. The least frequently used nutrition activities were growing vegetables and exploration of ethnic foods.

These results indicate that teachers are most likely to employ teaching strategies that can be easily integrated into mealtimes and snack times.

Kindergarten teachers' attitudes and knowledge of the Dietary Guidelines and nutrition education were measured by Murphy, Youatt, Hoerr, Sawyer, and Andrews (1995).

Approximately 75% of the teachers perceived their knowledge of nutrition to be "very good" and 56% expressed interest in learning more about nutrition. While most teachers believed that children needed to learn about nutrition, they also indicated that they teach nutrition three hours or less per school year. Teachers displayed competence in their knowledge of the Dietary Guidelines, including the concepts of variety, healthy weight, the relationship between fat and health consequences, and dietary sources of fat, fiber and salt.

### **Physical Activity in Childcare**

According to Wishon, Bower, and Eller, obesity in older preschool children cannot be blamed solely on poor eating habits. The culprit, the authors assert, is inactivity, which they say is "as important as food intake in the development of obesity" (1983, p. 25). While adults tend to think of young children as extremely active, preschoolers may spend less time in physical activity than adults perceive, with overweight and inactive children being the least likely to exercise vigorously (Carlson, 1994).

Childcare providers influence children's physical activities and fitness levels as well as their feeding and nutrition behaviors. On a daily basis, childcare providers make decisions about the environment that determine, to some extent, children's opportunities for physical activity. Providers decide if the weather is acceptable for outdoor play. Outdoor activities are associated with increased levels of physical activity for children (Klesges, Eck, Hanson, Haddock, & Klesges, 1990).

Providers may organize a group gross motor activity, such as parachute play, or decide that children will have “free play” and engage in activities of their choice on the playground. Sallis, Berry, Broyles, McKenzie and Nader (1995) found that day-to-day environmental factors, such as being outdoors and being encouraged to participate in physical activity, were the strongest correlates of physical activity for young children.

Providers typically plan the daily schedule, which may have many opportunities for active play or rely heavily on sedentary activities, such as television or computers. Rideout, Vandewater, and Wartella (2003) found that children under six years spent approximately the same amount of time on “screen media” (TV, videos, video games, and computers) as they do playing outdoors. Higher BMIs in children have been linked to lack of physical activity and television viewing (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998). In a study of how reinforcement affects sedentary behaviors in overweight children, Epstein, Saelens, and O’Brien (1995) found that reducing access to sedentary behaviors can result in overweight children participating in more active behaviors. In a later study, Epstein, Saelens, Myers and Vito (1997), found, in a study of 34 obese children, that positive reinforcement for reducing sedentary activities and punishment for being sedentary were both more effective for increasing physical activity than reducing access to the sedentary behaviors. Positive reinforcement was the most preferable method, however, because it was the only one that simultaneously increased physical activity and decreased children’s preference for sedentary activities.

Providers construct and maintain spaces and equipment for children’s physical activity that promote safety and encourage active play. Dietz and Gortmaker (1984), found children’s exercise patterns to be dependent on a safe, accessible, and appropriate environment, both

indoors and outdoors. In a study of preschool-age physical activity and eating habits, Bosch (2000) found that barriers to young children's physical activity included insufficient space, concerns for safety, and time spent watching television. As teachers and supervisors of children, providers are influential gatekeepers of children's day-to-day physical activity patterns.

### **The Importance of Physical Activity for Young Children**

According to the American Academy of Pediatrics (1992):

Most preschool children are inherently active and experience a strong drive for motor activity. Motor activity is the means by which preschoolers explore their environments, achieve physical closeness, and communicate with others, and it is an essential component of their physical and cognitive development.

It is likely that most preschool children achieve adequate levels of physical fitness when allowed to express their innate curiosity and natural propensity for active exploration in a safe environment (p. 1002).

Physical activity is recognized as one of the essential elements of successful weight control. Physical activity has other benefits, too, including increased strength, energy, and endurance; better cardiovascular functioning; and an enhanced physical appearance (Luepker, 1999). Children with healthy body composition (percent fat) and lipid profiles typically perform better on standardized tests of physical fitness (Harsha, 1995).

The positive effects of physical activity for children extend to all parts of children's development. According to Pica (1997, p. 11) "Not only does movement help ensure physical fitness, but it also significantly contributes to self-esteem, pro-social character traits,

creative- and critical-thinking skills, and an enhanced capacity for learning and problem solving.”

Lack of adequate and appropriate physical activity in early childhood years also has implications. Miller (1999) notes that inadequate movement experiences for children can result in “clumsiness, lack of physical strength, lack of willingness to be a risk-taker, and low self-esteem,” (p. 59). Poest, Williams, Witt and Atwood (1990) found that children who do not develop motor skills are often left out of games by peers, have poor peer relationships, and are often frustrated when they participate in activities that require complex motor skills.

### **Physical Activity Levels of Young Children**

According to Harsha (1995, p. S110), “There is . . . growing concern that . . . children today are less physically active and fail to derive benefit from physical activity. Current data support the idea that children do not participate in health-promoting activities for sustained periods.” A study conducted by Salbe, Fontvieille, Harper and Ravussin (1997) found the physical activity levels of 127 five-year-old children to be 20% to 30% lower than the World Health Organization’s recommended level. Ebbeling, Pawlak and Ludwig (as cited in *The Power of Movement*, zerotothree.org) found that three-year-old children’s calorie intake had increased when compared to 25 years ago, and this, with decreased physical activity, had resulted in 200 “unburned” calories a day. In a study of physical activity in overweight and non-overweight preschool children, overweight males were less active than non-overweight males during the preschool day (Trost, Sirard, Dowda, Pfeiffer, & Pate, 2003). Anderen et al. (1998) found that children who were physically inactive or watched television frequently tended to be the most overweight.

The Framingham Children's Study (Moore, Uyen-Sa Nguyen, Rothman, Cupples, & Ellison, 1995) investigated factors related to childhood eating habits and physical activity patterns and found that low physical activity levels had a "moderately strong" effect on the level of body fatness of children between preschool and first grade. Further, children who were already overweight seemed to be more negatively affected by physical inactivity than were leaner children who were also inactive. This study suggests that absence of physical activity may be more detrimental for overweight children than for children who are at a healthy weight.

Gender differences in physical activity levels of preschoolers have been indicated. Poest (1989) found that preschool-age males are typically more active than their female peers, a trend that becomes more pronounced as children get older (Luepker, 1999; Lindquist et al. 1999; Andersen et al. 1998) and may be influenced by an interaction of factors, including differences in motor skill development and body composition and socialization of male children that emphasizes physical activity and sports (Kohl & Hobbs, 1997).

Differences in physical activity among ethnic groups are also indicated. Andersen et al. (1998) found Mexican-American and African-American children to be less physically active than their Caucasian peers. Lindquist, Reynolds, and Goran (1999) found higher levels of physical fitness among Caucasian children and fewer school-based physical education opportunities for African-American children.

### **Physical Activity in the Childcare Environment**

As concern about children being overweight grows, childcare providers are being asked to help children be more physically active. Poest et al. (1989, p. 373) note: "As more and more children between birth and 8 years of age spend increasing amounts of time in day care,

fitness and motor development become critical issues . . . [and] without . . . healthy exercise habits and the development of fundamental motor skills in the early years . . . children may find themselves at physical disadvantage later on . . .”.

Research indicates that planned physical activity is often a sporadic, semi-planned part of the typical childcare curriculum. Weather, philosophical beliefs, lack of provider training, and inadequate equipment and space appear to have detrimental effects on young children’s participation in regular, vigorous physical activity. In a study of how Australian child care providers perceived children’s physical activity while in care, Temple and O’Connor (n.d.) found that while providers valued physical activity for children, they felt hindered by a perceived lack of confidence, ideas and competence in their abilities to lead the children in physical activities and by barriers in the environment, particularly when there was inclement weather and the children played indoors. All of the centers in the study had rules that banned running, climbing, and throwing indoors, and participants expressed confusion as to how to incorporate gross motor play indoors when regulations did not support such play.

In a study of 514 preschool-age children’s physical activity patterns, Poest et al. (1989) found that vigorous physical activity often does not take place year-round in childcare environments, with only 27.5% of children participating in year-round, consistent physical activity and younger children affected the most by weather factors.

In an attempt to provide children with activities that promote their cognitive, emotional, and social development, many providers find little time for planned physical activities. “Most child care programs,” according to Poest et al. (1989, p. 368) “emphasize fine motor skills, social skills and academic concepts while the daily schedule limits the activity patterns of the children.” Gross motor development, in contrast to other parts of the early childhood

curriculum, often does not have specific objectives to measure progress and development of skills (Javernick, 1988). When physical activity and outdoor play are limited or are de-emphasized, children may perceive those activities negatively or as unimportant (Sutterby & Frost, 2002).

Poest et al. (1990) notes that adults tend to think that children's motor and movement skills will develop naturally, but maturation alone typically results in the child performing the movement skill at a very basic level. It is the combination of maturation with practice and instruction that results in competent motor development. According to Javernick (1988), gross motor activity, more than other parts of the curriculum, has been viewed as child-determined and child-directed, with an assumption that children would independently engage in vigorous, appropriate physical activity and that the provider's main role was to create an environment that supported exploration. The notion of "child determined" physical activity was also noted by Carlson (1994, p. 1) who found that providers tend to encourage participation in indoor activities, while time outdoors is viewed as "free play," which children may or may not use for vigorous physical activity.

Childcare providers may inadvertently contribute to children's physical inactivity because they are less likely to participate in physical activity with children than in other areas of the curriculum. Many childcare providers who enthusiastically interact with children in the art, science, dramatic play and block areas watch passively as children engage in physical activity. Notes Carlson (1994, p.1), "Providers are apt to set up the slide or put out the tricycles and then stand by and watch." In a 1978 study by Miller (as cited in Javernick, 1988), preschoolers were divided into four groups. Two groups were taught motor skills by childcare providers and parents, one group used the same equipment without adult instruction

or encouragement, and the fourth group did not receive any instruction or have access to the equipment. At the end of 27 weeks, children who received instruction in motor skills from parents and providers showed significant gains in their motor skill development while the “free play” and control groups lagged behind. With no adult supervision or encouragement, the “free play” group explored the motor skill equipment for a few days and then began to play in small, quiet, largely inactive groups. Javernick concluded, “Children are attracted to classroom activities in which a teacher is enthusiastically participating . . . children who see their teachers engaged in vigorous physical activity are likely to join in” (p. 20). In a study of providers’ preferences for active play equipment, 70% of the equipment requested (climbers, slides, and swings) supported independent active play, with only 28.7% of the equipment requests designated for materials (balls, hoops, balance beams and bean bags) that would indicate a teacher-led preschool gross motor program (Poest, et al., 1989).

Many childcare providers have little to no background in child development. Poest et al. (1989) found in a survey of 65 childcare providers that only 17% had training in early childhood development. Gallahue (1976, as cited in Poest et al., 1989) and Hanson (1980, as cited in Poest et al., 1989) found that childcare providers lacked knowledge about the role of physical activity in the childcare environment and how to successfully integrate it into the curriculum.

The physical environment of some childcare programs may not be adequate to support vigorous physical activity. Bosch (2000) found that barriers to physical activity with preschoolers were limited time and energy, lack of space, and concerns for safety. The popularity of stationary play apparatuses, like “bouncy seats” has restricted whole body movement for many babies (*The Power of Movement*, zerotothree.org).

## **Recommendations for Increasing Young Children's Physical Activity**

A number of recommendations have emerged for increasing young children's physical activity levels. According to the National Association for Sport and Physical Education (NASPE, 2002), appropriate physical activities for young children are part of the child's daily life, involve small and large muscles, are fun, and make the child feel successful.

The American Academy of Pediatrics (AAP, 1992) recommends that preschool children participate in developmentally and physically appropriate physical activities with an ultimate goal of lifelong fitness. The AAP also recommends that young children have opportunities for "free play" that builds motor skills, rather than highly structured sessions, and that a child's eagerness and enjoyment of organized sports should determine readiness to participate. The National Association for Sport and Physical Education (NASPE) has adopted specific guidelines that encourage movement and motor development for infants, toddlers, and preschoolers that emphasize safety, progression of skills, and indoor and outdoor environments for activities.

An effective large-muscle development program for young children, according to Poest et al. (1990) addresses movement skills, physical fitness and perceptual-motor development. Fundamental movement skills include locomotion, manipulative, and balance skills. Physical fitness is comprised of cardiovascular and muscular endurance, strength, flexibility and leanness. Perceptual-motor development involves taking data from the senses and responding with movement. Components of perceptual-motor development are body, time, spatial, directional, visual and auditory awareness, and include activities such as marching to a beat (time awareness), following verbal instructions (auditory awareness), and naming and locating body parts (body awareness).

Campbell (1997) cites a number of issues related to the appropriateness and effectiveness of young children's perceptual motor programs. Specific concerns and criticisms include low rates of actual physical activity during the time set aside for that purpose, little skill instruction from teachers during the physical activity session, a teacher-centered instructional style that does not promote play-based movement activities, limited opportunity for children to develop social skills and behaviors during the sessions, lack of variety of perceptual movement activities that does not account for individual children's interests and abilities, and a multiple group or "station" class format that does not allow children to experience physical activity individually or in different groups.

Many recommendations revolve around increasing children's time spent outdoors. According to Klesges et al. (1990, p. 445), "the positive effect of an outdoor environment on activity levels of children may have important implications because outdoor environments are probably more conducive to higher (or more frequent) levels of physical activity than indoor . . . environments." Sutterby and Frost (2002) note that while indoor and outdoor environments are important to children's development, "radically different types of play" occur indoor and out (p. 37).

Indoor environments, too, can be adapted to encourage vigorous physical activity. Miller (1999) suggests using balloons, parachutes, blankets and balls indoors to increase children's activity levels.

Poest et al. (1989) calls for training for childcare providers that focuses on children's physical development and curriculum that addresses fitness and motor development.

Another area that training could address is how providers can plan for physical activity.

Poest et al. (1990) notes that gross-motor play needs to be planned for in the same way that

activities are planned in other areas of the center and suggests using weekly themes, such as “balance skills” or “locomotion skills” to encourage focused and purposeful physical activity.

### **The Childcare Provider as a Role Model**

Similarly to parents, childcare providers may serve as role models for children in many areas, including nutrition and physical activity.

#### **Provider Influence on Nutrition and Food Intake**

Research indicates that adults (in addition to parents) influence children’s food choices. According to Briley and Roberts-Gray (1999), “Those engaged in direct care giving should be informed about . . . the importance of their role as a model for the children to follow in acquiring healthful behaviors,” (p. 985). Thomas, Pfeil, and Guerra note the connection between nutrition and growth and development: “Because children come into child care facilities and are cared for by a variety of providers in their formative years it cannot be emphasized enough that their influence is significant and affects a child’s eating behavior, as well as the potential for optimal growth and well-being . . . “ (1997, p. 46).

Wright and Radcliffe (1992) interviewed 74 parents of 4- to 6-year old children and found that, generally, parents perceived family influence to be greater than that of child- care on children’s eating behaviors, although 50% did indicate that they felt influence was shared with childcare.

Lytle et al. (1997) concluded in a study of 141 elementary school students’ perceptions of nutrition messages that children were highly influenced by adults in their ideas about “good” and “bad” foods, dieting and body image. The authors conclude:

Adults must . . . realize how their attitudes and behaviors around nutrition and food choices influence children. Adult influence goes beyond making healthful

food available to children or giving children verbal messages about a healthful diet. It is important to keep in mind that common phrase ‘Actions speak louder than words’ when attempting to understand and influence children’s eating behavior (p. 135).

In a study of 24 licensed childcare centers in Illinois, 86% of the providers indicated that they believed they influenced children’s eating habits when they ate with the children. Of the respondents, 95% agreed that caregivers should sit with the children at meal times, with 75% agreeing that it was important for the caregiver to eat the same foods as the children for meals and snacks (Nahikian-Nelms, 1997).

Nahikian-Nelms, Sarvela, Mogharreban, and Anderson (1995) found in a study of 113 childcare providers that childcare providers had mostly positive attitudes toward nutrition and exhibited appropriate mealtime behaviors in the center but that their knowledge of nutrition was lacking (with a mean score of 10.95 out of a possible 20 points on a 20-item nutrition knowledge test). The study also found significant relationships between caregivers’ attitudes toward nutrition, caregiver behavior in regards to nutritional practices within the childcare environment, and caregiver knowledge of nutrition.

Childcare providers seem to particularly influence young children’s food preferences. Harper and Sanders (1975) conducted a study in which adults offered children aged 14 to 48 months foods individually. Children were more likely to try the food if the adult was also eating it than if the adult simply presented it to the child. In a study conducted by Hendy and Raudenbush (2000), preschool children responded more readily to accepting new foods when their teacher was enthusiastic about the new food than when the teacher modeled silent acceptance (by consuming the food in front of the child without comment).

## **Provider Influence on Children's Physical Activity**

Klesges et al. (1990, p. 446) note that “modeling of and participation in children’s [physical] activity may be the most salient in affecting a preschooler’s behavior, particularly for children at moderately high risk for obesity.” LaMaster, McKenzie, Marshall, and Sallis (1998) found that elementary school teachers who exercised and were most physically active in their personal free time encouraged fitness, provided more active instruction, and offered children more opportunities for physical activity than less physically active teachers. The NASPE guidelines encourage providers to be a role model for physical activity but make a distinction between providing instruction for a physical skill and stepping back during exploration activities.

### **Conceptual Framework**

The goal of this research is to shed light on the question, “What are child care providers’ perceptions of their influence on obesity in early childhood?” There is an increasing awareness that being overweight and obese are problems that often have their beginnings in childhood. Much of the existing research on childhood obesity focuses on school-age children and adolescents; there is less research on young children being overweight. Of the research that does exist, a large portion is devoted to the family’s role in influencing young children’s weight. Little research exists that examines the role of childcare providers in childhood obesity, or how childcare providers perceive their influence on children’s weight.

Childcare providers potentially affect young children’s weight because they provide meals and snacks, organize physical activity and exercise, determine nutrition education curriculum, and serve as role models to the children in their care. While there is research that focuses on these topics individually, the researcher could find no comprehensive research

that examined childcare providers' perceptions of how they affected obesity in early childhood and how socio-demographic, physical, psychological, and organizational factors of the providers affected those perceptions.

The dependent variable in this study is the perceptions childcare providers have of their influence on obesity in young children. The independent variables include personal demographics of the providers (age, education, gender, race, and socio-economic status), physical factors of the providers (including personal weight, eating and physical activity habits), psychological factors of the providers (attitudes toward childcare, self-concept, quality of life, and attitude toward serving as a role model) and organizational factors of the provider and childcare facility (tenure, training, size of class, participation in the Child and Adult Care Food Program, and the facility's "star" licensing rating).

## **CHAPTER 3**

### **METHODOLOGY**

#### **Population and Sample**

The population for this study is childcare providers in Western North Carolina who serve children ages 0-5 in a licensed childcare arrangement. The sample for this study will be 100+ childcare providers who are enrolled in early childhood education courses in the five westernmost community colleges in North Carolina: Tri-County Community College, Southwestern Community College, Haywood Community College, Asheville-Buncombe Technical Community College, and Blue Ridge Community College. These students represent a variety of social, economic and cultural backgrounds, as well as diversity in age, ethnic background, and tenure in the early childhood profession.

Providers enrolled in both face-to-face classes and on-line classes will participate in the study. Many early childhood courses at community colleges are currently taught on-line to accommodate the schedules of childcare providers. The investigator solicited participation in this study by contacting early childhood instructors at the community colleges via email and getting their cooperation in obtaining access to students in their classes who are employed in licensed childcare facilities.

The research will employ a convenience sample of childcare providers in Western North Carolina. Mailing lists of licensed childcare centers and family childcare homes have been compiled by the N.C. Division of Child Development, but no comprehensive mailing list of individuals employed in childcare exists. Because of the intensive nature of caring for young children and licensing regulations that require specific child-to-staff ratios, it would be difficult, if not impossible, to complete survey research in the child-care setting.

### **Instrumentation**

The research will be conducted using a multi-section survey that will measure each variable using a Likert scale. The survey will be field-tested with 15 childcare providers at Asheville City Schools Preschool and will be reviewed for face and content validity by a professor of birth-kindergarten education and a professor of health sciences who is also a registered dietician. Internal validity of the scales will be measured using Cronbach alpha. Split-half reliability will be used to address internal consistency.

### **Procedures**

The multi-section survey will be administered to the face-to-face classes at the five community colleges by the researcher or by the instructors, who will receive copies of the survey from the researcher. It is estimated that the survey will take the participants approximately 15-20 minutes to complete. The on-line students will receive the survey via e-mail from the course instructor and will return the survey via e-mail to the course instructor, who will then forward it to the researcher.

### **Data Collection**

Data will be collected in survey form from providers in classes at the five community colleges. The researcher or instructors will administer the survey in classes that meet face-to-face. The instructors will assist in emailing the survey to providers in on-line classes who will return the surveys via email to the instructor, who will then forward them to the researcher. This will ensure confidentiality of individual results.

### **Data Organization & Analysis**

Data will be analyzed using SPSS 10.0 for Windows (Statistical Package for the Social Sciences). Tables that address the research questions will be used to organize and present the data.

Descriptive statistics, including means, percentages, and frequency distributions, will be used to summarize and describe the data. The null hypotheses will be tested using analysis of variance (ANOVA) and *t*-tests. The level of statistical significance for these procedures will be .05.

### **Implications**

The results of this study will provide information on how childcare providers perceive their influence on early childhood obesity. Further, the study will identify which areas (meals and snacks, nutrition education, physical activity, and modeling) on which providers feel they have the greatest and least influence. The results of this study will contribute to a limited body of research that examines the effects of the childcare environment and the adult childcare provider on obesity in early childhood.

The results of this study should provide a foundation for further research that investigates the effects of the childcare environment and the childcare provider's influence on the problem of childhood obesity. Further research may also look at how time spent in sedentary activities in childcare, such as watching television and working on the computer, may impact the weight of children who attend childcare.

### **Applications**

As a result of this study, childcare providers may perceive their role in regards to preventing childhood obesity differently. If providers perceive their influence on early

childhood obesity to be strong, this has implications for how to approach menu planning, nutrition education, and physical activity education in training and other educational efforts aimed at that audience. Conversely, if the providers perceive their influence on childhood obesity to be weak, this too has implications, particularly in how wellness education is presented to providers at workshops and conferences in the future. Further, identification of characteristics of providers that affect their perceptions of their influence on children's weight will be useful in designing appropriate educational materials and opportunities. Generally, the results of this study will be useful to the professional who is planning to collaborate or instruct providers about menu planning, nutrition education, and physical education in the early years of a child's life.

## **CHAPTER 4**

### **FINDINGS**

The purpose of this research was to investigate how socio-demographic, physical, psychological, and organizational variables affect childcare providers' perceptions of their influence on obesity in early childhood, what childcare providers' perceptions are of their role in the prevention of obesity in early childhood in regards to providing healthy meals and snacks, providing appropriate nutrition education, promoting physical activity and serving as a role model for children in regards to nutrition and physical activity, and how much influence childcare providers perceive that they have in influencing children's weight. Data were collected using surveys from a convenience sample of childcare providers in early childhood education programs at the five westernmost community colleges in North Carolina.

This chapter presents the findings of this study, including a description of the respondents according to their demographic, physical, psychological, and organizational characteristics. It includes answering six research questions pertaining to the relationship between the dependent variables of influence on meals and snacks, nutrition education and physical activity and the independent variables of demographic factors (gender, ethnic background, age, educational level, income), physical factors (personal weight, personal physical activity pattern, personal eating habits), psychological factors (attitude toward childcare, self-concept, quality of life, serving as a role model) and organizational factors (tenure, training, size of class, participation in the CACFP, and facility licensing), the perceptions providers have about their role in preventing obesity in early childhood, and how much influence providers perceive that they have in regards to influencing children's weight.

**Frequency and Percentage Distribution of Participants by Community College**

A total of 120 individuals, 41 (34.5 percent) at Asheville-Buncombe Technical Community College, 13 (10.9 percent) at Blue Ridge Community College, 20 (16.8 percent) at Haywood Community College, 26 (21.8 percent) at Southwestern Community College, and 19 (16.0 percent) at Tri-County Community College, supplied the data that were used in the analysis of this research. The frequency and percentage distribution of respondents by community college is represented in Table 4.1.

Table 4.1 Frequency and Percentage Distribution by Community College for Total Respondents N=120		
Variable	No.	%
<b>Community college</b>		
Asheville-Buncombe Technical Community College	41	34.5
Blue Ridge Community College	13	10.9
Haywood Community College	20	16.8
Southwestern Community College	26	21.8
Tri-County Community College	<u>19</u>	<u>16.0</u>
<b>TOTAL</b>	119	100.0

**Providers’ Perceived Influence on Children’ s Weight**

Childcare providers’ perceived influence on children’s weight is represented in Tables 4.2, 4.3, and 4.4.

**Providers’ Perceived Influence on Children’s Nutritional Habits**

The frequency and percentage distribution of participants’ perceptions of their influence on children’s nutritional habits is represented in Table 4.2.

Table 4.2 Frequency and Percentage Distribution of Providers' Perceived Influence on Children's Nutritional Habits for Total Participants N=120	No.	%
<b>I would describe my influence as a childcare provider on the nutritional habits of the children in my care as:</b>		
Very high influence	35	29.4
Somewhat high influence	51	42.9
Moderate to low influence	<u>33</u>	<u>27.7</u>
TOTAL	119	100.0

The largest percentage of providers (51 participants, or 42.9 percent) perceived their influence on children's nutritional habits to be of somewhat high influence, followed by 35 participants (29.4 percent) who indicated they believed their influence on children's nutritional habits to be very high, and by 33 participants (27.7 percent), who said their influence on the nutritional habits of the children in their care was moderate to low.

#### **Providers' Perceived Influence on Children's Physical Activity Habits**

The frequency and percentage distribution of providers' perceived influence on children's physical activity habits is represented in Table 4.3.

Table 4.3 Frequency and Percentage Distribution of Providers' Perceived Influence on Children's Physical Activity Habits for Total Participants N=120	No.	%
<b>I would describe my influence as a childcare provider on the physical activity habits of the children in my care as:</b>		
Very high influence	44	37.0
Somewhat high influence	42	35.3
Moderate influence	28	23.5
Somewhat low or low influence	<u>5</u>	<u>4.2</u>
TOTAL	119	100.0

The largest percentage of participants (37 percent, or 44 individuals) perceived their influence on children's physical activity habits to be very high. Another 42 participants (35.3 percent) believed their influence on children's physical activity to be of somewhat high

influence. Of the remaining participants, 28 (23.5 percent) perceived their influence to be moderate, and 5 (4.2 percent) indicated their influence was somewhat low or low.

**Providers’ Perceived Influence on Nutrition Education for Children in Their Care**

The frequency and percentage distribution of how providers perceive their influence on the nutrition education that the children in their care receive is represented in Table 4.4

Table 4.4 Frequency and Percentage Distribution of Providers’ Perceived Influence on Children’s Nutrition Education for Total Participants N=120	No.	%
<b>I would describe my influence as a childcare provider on the nutrition education that the children in my care receive as:</b>		
Very high influence	35	29.2
Somewhat high influence	50	41.7
Moderate influence	31	25.8
Somewhat low or low influence	4	3.3
<b>TOTAL</b>	<b>120</b>	<b>100.0</b>

The largest percentage of participants (41.7 percent, or 50 individuals) indicated that they perceived their influence on the children’s nutrition education to be somewhat high. Thirty-five (29.2 percent) of the participants answered that their influence on children’s nutrition education was very high. Of the remaining participants, 31 (25.8 percent) said their influence on nutrition education was moderate and 3.3 percent (4 individuals) indicated that their influence on nutrition education was somewhat low or low.

**Demographic Variables of Participants**

The demographic variables selected for this study included gender, ethnic background, age, educational level and income. The frequency and percentage distribution of demographic variables for participants is represented in Table 4.5

Table 4.5 Frequency and Percentage Distribution by Demographic Factors for Total Participants N=120		
Variable	No.	%
<b>Gender</b>		
Female	117	97.5
Male	<u>3</u>	<u>2.5</u>
TOTAL	120	100.0
<b>Ethnic Background</b>		
White/Caucasian	113	95.8
Non-white	<u>5</u>	<u>4.2</u>
TOTAL	118	100.0
<b>Age</b>		
Under 20 years	1	.9
20 years to 29 years	35	31.4
30 years to 39 years	29	26.1
40 years to 49 years	32	28.8
50 years to 59 years	<u>15</u>	<u>13.5</u>
TOTAL	112	100.0
<b>Education</b>		
GED/high school/some college	56	46.7
Associate's degree	47	39.2
Bachelor's degree/Master's degree	<u>17</u>	<u>14.2</u>
TOTAL	120	100.0
<b>Income</b>		
\$0-\$30,000	111	96.5
\$30,001+	<u>4</u>	<u>3.5</u>
TOTAL	115	100.0

### Participants' Gender

Of the 120 respondents to the survey, 117 (97.5 percent) were female. Three males comprised the remaining 2.5 percent of the participants.

### Participants' Ethnic Background

Of the 120 respondents, 113 (95.8 percent) selected white/Caucasian as their ethnic background and 5 (4.2 percent) selected non-white (including African-American, Native American, and Hispanic) as their ethnic background.

### **Participants' Age**

Participants were asked to list their birth date on the survey and their age was calculated from that response. Of the respondents, 1 individual (.9 percent) was under 20 years of age, 35 individuals (31.4 percent) were age 20 to 29 years of age, 29 individuals (26.1 percent) were 30 to 39 years of age, 32 individuals (28.8 percent) were 40 to 49 years of age, and 15 individuals (13.5 percent) were 50 to 59 years of age. Eight respondents elected not to answer this question.

### **Participants' Education**

Of the respondents, 56 (46.7 percent) had completed a GED, had a high school diploma, or had completed some college coursework. Of the remaining respondents, 47 (39.2 percent) had completed an associate's degree, and 17 (14.2 percent) had completed either a bachelor's degree or master's degree.

### **Participants' Income**

Respondents were asked to indicate their annual household income. Of the respondents, 111 (96.5 percent) had an annual household income of \$0 to \$30,000 and 4 respondents (3.5 percent) had an income of over \$30,000. Five respondents elected not to answer this question.

## **Relationships of Demographic Variables to Provider Influence on Children's Weight**

The relationship of the demographic variables of participants to their influence on children's nutritional habits, physical activity patterns, and nutrition education are represented in Tables 4.6, 4.7 and 4.8

## Relationship of Demographic Variables to Providers' Influence on Children's Nutritional Habits

The relationship of demographic variables to providers' influence on children's nutritional habits is represented in Table 4.6.

Variable	$X^2$	$df$	Sig.
Gender	1.28	2	.53
Ethnic background	6.77	2	.03*
Age	69.41	74	.63
Education	1.43	4	.84
Income	1.44	4	.84

\*Significant at p value <.05

In regards to the relationship of participants' gender to provider influence on children's nutritional habits, the value of  $X^2$  was 1.28 ( $df=2$ ). In this research, providers' influence on children's nutritional habits is not related to providers' gender.

The relationship of participants' ethnic background to their influence on children's nutritional habits was represented by a  $X^2$  value of 6.77 ( $df=2$ ), which is statistically significant at the .05 probability level. In this research, providers' influence on children's nutritional habits is related to providers' ethnic background.

In regards to the relationship of providers' age to influence on children's nutritional habits, the value of  $X^2$  was 69.41 ( $df=74$ ). In this research, providers' influence on children's nutritional habits is not related to providers' age.

The relationship of providers' education level to their influence on children's nutritional habits is represented by a  $X^2$  value of 1.43 ( $df=4$ ). In this research, providers' influence on children's nutritional habits is not related to providers' educational level.

In regards to the relationship between providers' income and their influence on children's nutritional habits, the value of  $X^2$  was 1.44 ( $df=4$ ). In this research, providers' influence on children's nutritional habits is not related to providers' annual household income.

### **Relationship of Demographic Variables to Providers' Influence on Children's Physical Activity Habits**

The relationship of demographic variables to providers' influence on children's physical activity habits is represented in Table 4.7.

Variable	$X^2$	$df$	Sig.
Gender	1.59	3	.66
Ethnic background	4.28	3	.23
Age	132.30	111	.08
Education	4.05	6	.67
Income	10.24	6	.12

\*Significant at p value <.05

The relationship between participants' gender and their influence on children's physical activity is represented by a  $X^2$  value of 1.59 ( $df=3$ ). In this research, providers' influence on children's physical activity habits is not related to providers' gender.

Regarding the relationship of participants' ethnic background to their influence on children's physical activity habits, the value of  $X^2$  was 4.28 ( $df=3$ ). In this research, providers' influence on children's physical activity habits is not related to providers' ethnic background.

The relationship of participants' age to their influence on children's physical activity habits was represented by a  $X^2$  value of 132.30 ( $df=111$ ). In this research, providers' influence on children's physical activity habits is not related to providers' age.

The relationship of participants' educational level to their influence on children's physical activity is represented by a  $X^2$  value of 4.05 ( $df=6$ ). In this research, providers' influence on children's physical activity habits is not related to providers' educational level.

In regards to the relationship of participants' income level to their influence on children's physical activity, the value of  $X^2$  was 10.24 ( $df=6$ ). In this research, providers' influence on children's physical activity habits is not related to providers' annual household income.

### **Relationship of Demographic Variables to Providers' Influence on Nutrition**

#### **Education**

The relationship of demographic variables to providers' influence on nutrition education is represented in Table 4.8.

Variable	$X^2$	$df$	Sig.
Gender	2.43	3	.49
Ethnic background	3.13	3	.37
Age	109.10	111	.53
Education	2.35	6	.89
Income	1.65	6	.95

\*Significant at p value <.05

In regards to the relationship between participants' gender and their influence on nutrition education, the value of  $X^2$  was 2.43 ( $df=3$ ). In this research, providers' influence on nutrition education is not related to providers' gender.

In regards to the relationship between participants' race and their influence on nutrition education, the value of  $X^2$  was 3.13 ( $df=3$ ). In this research, providers' influence on nutrition education is not related to providers' ethnic background.

In regards to the relationship between participants' ages and their influence on nutrition education, the value of  $X^2$  was 109.10 ( $df=111$ ). In this research, providers' influence on nutrition education is not related to providers' age.

In regards to the relationship between participants' educational levels and their influence on nutrition education, the value of  $X^2$  was 2.35 ( $df=6$ ). In this research, providers' influence on nutrition education is not related to providers' educational levels.

The relationship of participants' annual income to their influence on nutrition education was represented by a  $X^2$  value of 1.65 ( $df=6$ ). In this research, providers' influence on nutrition education is not related to providers' annual household income

### Physical Variables of Participants

The frequency and percentage distribution of the physical variables of providers, including personal weight, eating habits, and physical activity patterns are represented in Table 4.9.

Table 4.9 Frequency and Percentage Distribution of Provider's Personal Nutritional and Physical Activity Behaviors for Total Participants N=120		
Variable	No.	%
<b>I would describe my own weight as:</b>		
very underweight for my height and frame	5	4.2
slightly underweight for my height and frame	4	3.3
normal weight for my height and frame	39	32.5
slightly overweight for my height and frame	53	41.7
very overweight for my height and frame	<u>19</u>	<u>15.0</u>
TOTAL	120	100.0
<b>I would describe my personal eating habits as:</b>		
I eat healthy foods all the time, as described by the FGP	3	2.5
I usually eat healthy foods, as described by the FGP	78	65.0
I infrequently eat healthy foods, as described by the FGP	34	28.3
I almost never or never eat healthy foods, as described by the FGP	<u>5</u>	<u>4.2</u>
TOTAL	120	100.0
<b>I would describe my personal physical activity pattern as:</b>		
sedentary	36	30.0
moderately active	78	65.0
vigorously active	<u>6</u>	<u>5.0</u>
TOTAL	120	100.0

### **Participants' Weight**

When asked to describe their personal weight, 39 (32.5 percent) said they were normal weight for their height and frame, 41.7 percent (53 participants) said they were slightly overweight in relation to their height and frame, and 19 (15 percent) described themselves as very overweight. Of those who described themselves as underweight, 4.2 percent (5 respondents) said they were very underweight for their height and frame and 3.3 percent (4 respondents) said they were slightly underweight for their height and frame.

### **Participants' Personal Eating Habits**

When asked to describe their personal eating habits, 78 participants (65.0 percent) answered that they usually ate healthy foods, as described by the USDA Food Guide Pyramid. Another 28.3 percent (34 participants) said they infrequently consume healthy foods. Of the participants, 4.2 percent (5 respondents) answered that they almost never or never eat healthy foods and 2.5 percent (3 respondents) said they eat healthy foods all the time.

### **Participants' Personal Physical Activity Patterns**

Of the participants, 78 (65.0 percent) described themselves as moderately active, 30.0 percent (36 participants) said they were sedentary, and 5.0 percent (6 participants) responded that they were vigorously active

### **Relationship of Physical Variables to Providers' Influence on Children's Weight**

The relationship of physical variables of providers to their influence on children's nutrition habits, physical activity and nutrition education is represented in Tables. 4.10, 4.11, and 4.12.

## Relationship of Physical Variables to Providers' Influence on Children's Nutritional Habits

The relationship of the physical variables of providers to children's nutritional habits is represented in Table 4.10.

Variable	$X^2$	$df$	Sig.
Personal weight	4.63	8	.80
Personal Eating Habits	5.77	6	.45
Personal Physical Activity	9.14	4	.06

\*Significant at p value <.05

The relationship of participants' weight to their influence on children's nutritional habits was represented by a  $X^2$  value of 4.63 ( $df=8$ ). In this research, providers' influence on children's nutritional habits is not related to providers' weights.

In regards to the relationship between participants' personal eating habits and their influence on nutrition education, the value of  $X^2$  was 5.77 ( $df=6$ ). In this research, providers' influence on children's nutritional habits is not related to providers' personal eating habits.

The value of  $X^2$  in regards to the relationship between participants' personal physical activity and their influence on children's nutritional habits was 9.14 ( $df=4$ ). In this research, providers' influence on children's nutritional habits is not related to providers' personal physical activity.

## Relationship of Physical Variables to Providers' Influence on Children's Physical Activity

The relationship of the physical variables of providers to their influence on children's physical activity is represented in Table 4.11.

Table 4.11 Relationship of Physical Variables to Providers' Influence on Children's Physical Activity N=120			
Variable	$X^2$	<i>df</i>	Sig.
Personal Weight	10.79	12	.55
Personal Eating Habits	8.90	9	.45
Personal Physical Activity	6.36	6	.39

\*Significant at p value <.05

In regards to the relationship between participants' weights and their influence on children's physical activity, the value of  $X^2$  was 10.79 ( $df=12$ ). In this research, providers' influence on children's physical activity is not related to providers' weights.

The relationship of participants' personal eating habits to their influence on children's physical activity was represented by a  $X^2$  value of 8.90 ( $df=9$ ). In this research, providers' influence on children's physical activity is not related to providers' personal eating habits.

The value of  $X^2$ , in regards to the relationship between participants' personal physical activity and their influence on children's physical activity was 6.36 ( $df=6$ ). In this research, providers' influence on children's physical activity is not related to providers' personal physical activity.

### **Relationship of Physical Variables to Providers' Influence on Children's Nutrition Education**

The relationship of the physical variables of providers to their influence on children's nutrition education is represented in Table 4.12.

Table 4.12 Relationship of Physical Variables to Providers' Influence on Nutrition Education N=120			
Variable	$X^2$	<i>df</i>	Sig.
Personal Weight	9.46	12	.66
Personal Eating Habits	6.97	9	.64
Personal Physical Activity	11.04	6	.09

\*Significant at p value <.05

In regards to the relationship between participants' weight and their influence on nutrition education, the value of  $X^2$  was 9.46 ( $df=12$ ). In this research, providers' influence on nutrition education is not related to providers' weights.

The relationship of participants' personal eating habits to their influence on nutrition education is represented by a  $X^2$  value of 6.97 ( $df=9$ ). In this research, providers' influence on nutrition education is not related to providers' personal eating habits.

In regards to the relationship between participants' personal physical activity and their influence on nutrition education, the value of  $X^2$  was 11.04 ( $df=6$ ). In this research, providers' influence on nutrition education is not related to providers' personal physical activity.

### **Psychological Variables of Participants**

The psychological variables of participants, including their feelings and attitudes toward the early childhood profession and their present job in childcare, their self-concept, their quality of life, and their actions as a role model at childcare (meals eaten, activity during meals, activity during outside play) are represented in Table 4.13

Table 4.13 Frequency and Percentage Distribution by Psychological Factors for Total Participants N=120		
Variable	No.	%
<b>Generally, my feeling/attitude toward the early childhood profession is:</b>		
Very positive	75	63.6
Somewhat positive	39	33.1
Neutral	4	3.4
Somewhat negative	0	0.0
Very negative	0	0.0
<b>TOTAL</b>	<b>118</b>	<b>100.0</b>

**Table 4.13 (continued)**

<b>Generally, my feeling/attitude toward my present job in childcare is:</b>		
Very positive	65	54.2
Somewhat positive	40	33.3
Neutral	7	5.8
Somewhat negative	6	5.0
Very negative	<u>2</u>	<u>1.7</u>
TOTAL	120	100.0
<b>Rate your self-concept, with “1” being poor, and “10” being great:</b>		
Step 1	0	0.0
Step 2	0	0.0
Step 3	1	.8
Step 4	2	1.7
Step 5	8	6.7
Step 6	7	5.9
Step 7	18	15.1
Step 8	52	43.7
Step 9	22	18.5
Step 10	<u>9</u>	<u>7.6</u>
TOTAL	119.0	100.0
Mean self-concept for participants	7.8	
<b>Rate your quality of life, with “1” being poor, and “10” being great:</b>		
Step 1	0	0.0
Step 2	0	0.0
Step 3	1	.8
Step 4	3	2.5
Step 5	4	3.4
Step 6	5	4.2
Step 7	12	10.1
Step 8	34	28.6
Step 9	33	27.7
Step 10	<u>27</u>	<u>22.7</u>
TOTAL	119.0	100.0
Mean quality of life for participants	8.3	
<b>For 50% or more of the meals that I eat while working at childcare, I:</b>		
eat the same foods served to the children	71	59.2
bring a bag/sack lunch from home	29	24.2
order out from a restaurant for pick-up or delivery	13	10.8
skip most meals at work or none of the above	<u>7</u>	<u>5.8</u>
TOTAL	120	100.0

**Table 4.13 (continued)**

<b>While the children are eating meals, 50% or more of the time I am:</b>		
eating “family-style” with the children	51	42.5
cleaning or straightening the room	3	2.5
serving/supervising the children & circulating around the dining tables	53	44.2
other	<u>13</u>	<u>10.8</u>
TOTAL	120	100.0
<b>On three of five days, while children in my care are playing outside, I am:</b>		
actively playing with the children in the play space/playground		
sitting/standing with co-workers, supervising children	84	70.6
sweeping, raking, or otherwise cleaning/straightening the play space	27	22.7
other	3	2.5
TOTAL	<u>5</u>	<u>4.2</u>
	119	100.0

### **Participants’ Feeling/Attitude Toward the Early Childhood Profession**

A majority (75 participants, or 63.6 percent) of respondents described their feeling/attitude toward the early childhood profession as very positive, 33.1 percent (39 participants) said they felt somewhat positive about the profession, and 3.4 percent (4 participants) said they felt neutral. No respondents expressed negative or somewhat negative feelings about the profession.

### **Participants’ Feeling/Attitude Toward Their Present Job in Childcare**

A majority (54.2 percent, or 65 participants) of respondents described their feeling/attitude toward their present job in childcare as very positive, and 33.3 percent (40 participants) said they felt somewhat positive. The remaining respondents indicated that they felt neutral about their present job in childcare (5.8 percent, or 7 respondents), somewhat negative (5.0 percent or 6 participants) or very negative (1.7 percent, or 2 participants).

### **Participants’ Self-Concept**

Participants were given a 10-step self-anchoring scale to describe their self-concept, with “1” representing a poor self-concept, and “10” representing a great self-concept. The biggest

percentage of participants (43.7 percent, or 52 participants) identified their self-concept as an “8” on the scale. Of the remaining respondents, 22 (18.5 percent) said their self-concept was a “9,” 18 (15.1 percent) said they were a step “7,” 9 (7.6 percent) described their self-concept as a “10,” 8 (6.7 percent) said their self-concept was a “5,” 7 (5.9 percent) indicated their self-concept was a “6,” and the remaining respondents said their self-concepts were a “4” (2 participants, or 1.7 percent) or a “3” (1 participant, or .8 percent). No respondents described their self-concepts as steps 2 or 1.

### **Participants’ Quality of Life**

Participants were presented with a 10-step self-anchoring scale to represent their quality of life, with “1” being a poor quality of life, and 10 being a great quality of life. The largest percentage of respondents (34 participants, or 28.6 percent) described their quality of life as step 8. Of the remaining respondents, 33 (27.7 percent) said their quality of life was a step 9, 27 (22.7 percent) described their quality of life as step 10, 12 (10.1 percent) answered step 7, 5 (4.2 percent) responded step 6, 4 (3.4 percent) answered step 5, 3 (2.5 percent) answered step 4, and 1 (.8 percent) responded step 3. No respondents described their quality of life as step 1 or step 2.

### **Participants’ Meals Eaten at Childcare**

Participants were asked what meal arrangements they made for themselves for 50 percent or more of the meals they ate while at childcare. The majority (59.2 percent, or 71 participants) said they ate the same foods that were served to the children. Of the remaining respondents, 24.2 percent (29 participants) answered that they brought their meals from home, 10.8 percent (13 participants) said they order from or pick-up from a restaurant, and

5.8 percent (7 participants) said they skip most meals at work or make some other arrangement.

### **Participants' Activity During Meals at Childcare**

Participants were asked what they were doing while the children were eating meals at childcare, 50 percent or more of the time. Fifty-three participants (44.2 percent) indicated they were serving and supervising the children and were circulating around the dining tables. Fifty-one participants (42.5 percent) responded that they ate “family-style” with the children. Of the remaining participants, 13 (10.8 percent) were involved in some other activity, and 3 (2.5 percent) were cleaning or straightening the room.

### **Participants' Activity During Children's Outdoor Play at Childcare**

Participants were asked, on three of five days, what activity they were involved in while children were playing outside. A majority (84 respondents, or 70.6 percent) were actively playing with the children on the playground or play space. Twenty-seven participants (22.7 percent) indicated that they were sitting or standing with co-workers and supervising children. Three participants (2.5 percent) said they were sweeping, raking, or otherwise straightening the play space, and 4.2 percent (5 participants) said they were performing other duties during outdoor play time.

## **Relationship of Psychological Variables to Providers' Influence on Children's Weight**

The relationship of psychological variables of providers to their influence on children's weight is represented in Tables 4.14, 4.15, and 4.16.

## Relationship of Psychological Factors to Providers' Influence on Children's Nutritional Habits

The relationship of the psychological factors of providers to children's nutritional habits is represented in Table 4.14.

Variable	$X^2$	$df$	Sig.
Attitude/feeling toward childcare profession	11.44	4	.02*
Attitude/feeling toward present job in childcare	13.41	8	.10
Self-concept	16.02	14	.31
Quality of life	10.59	14	.72
Provider activity during children's meals/snacks	4.20	6	.65
Provider activity during children's physical activity	5.75	6	.45
Provider meal arrangements at childcare	2.40	6	.88

\*Significant at p value <.05

In regards to the relationship between participants' attitude/feeling toward the childcare profession and their influence on children's nutritional habits, the value of  $X^2$  was 11.44 ( $df=4$ ). In this research, providers' influence on children's nutritional habits is related to their attitude/feeling toward the childcare profession and is significant at the .05 probability level.

The relationship between participants' attitude/feeling toward their present job in childcare and their influence on children's nutritional habits was represented by a  $X^2$  value of 13.41 ( $df=8$ ). In this research, providers' influence on children's nutritional habits is not related to attitude/feeling toward their present job in childcare.

The relationship between participants' self-concept and their influence on children's nutritional habits is represented by a  $X^2$  value of 16.02 ( $df=14$ ). In this research, providers' influence on children's nutritional habits is not related to self-concept.

The value of  $X^2$  that represents the relationship between participants' quality of life and their influence on children's nutritional habits was 10.59 ( $df=14$ ). In this research, provider's influence on children's nutritional habits is not related to of quality of life.

Regarding the relationship between provider activity during children's meals and snacks and provider influence on children's nutritional habits, the value of  $X^2$  was 4.20 ( $df=6$ ). In this research, provider influence on children's nutritional habits is not related to provider activity during children's meals and snacks.

The relationship of participants' activity during children's physical activity and children's nutritional habits is represented with a  $X^2$  value of 5.75 ( $df=6$ ). In this research, provider influence on children's nutritional habits is not related to provider activity during children's outdoor physical activity.

The relationship between participants' meal arrangements while at childcare and their influence on children's physical activity is represented with a  $X^2$  value of 2.40 ( $df=6$ ). In this research, provider influence on children's nutritional habits is not related to provider meal arrangements while at childcare.

### **Relationship of Psychological Factors to Providers' Influence on Children's Physical Activity**

The relationship of psychological factors of providers to children's physical activity is represented in Table 4.15.

Table 4.15 Relationship of Psychological Variables to Providers' Influence on Children's Physical Activity N=120			
Variable	$X^2$	$df$	Sig.
Attitude/feeling toward childcare profession	10.92	6	.09
Attitude/feeling toward present job in childcare	14.85	12	.25
Self-concept	18.17	21	.64

**Table 4.15 (continued)**

Quality of life	19.86	21	.53
Provider activity during children's meals/snacks	12.65	9	.18
Provider activity during children's physical activity	20.84	9	.01**
Provider meal arrangements at childcare	11.80	9	.23

\*Significant at p value <.05    \*\* Significant at p value <.01

The  $X^2$  value of the relationship between participants' attitude/feeling toward the childcare profession and their influence on children's physical activity was 10.92 ( $df=6$ ). In this research, provider's influence on children's physical activity is not related to attitude/feeling toward the childcare profession.

In regards to the relationship between participants' attitude/feeling toward their present job in childcare and their influence on children's physical activity, the value of  $X^2$  was 14.85 ( $df=12$ ). In this research, providers' influence on children's physical activity is not related to attitude/feeling toward participants' present job in childcare.

The value of  $X^2$ , which represents the relationship between participants' self-concepts and their influence on children's physical activity, was 18.17 ( $df=21$ ). In this research, provider's influence on children's physical activity is not related to participants' self-concept.

In regards to the relationship between participants' quality of life and their influence on children's physical activity, the value of  $X^2$  was 19.86 ( $df=21$ ). In this research, providers' influence on children's physical activity is not related to participants' quality of life.

The relationship between participant's activity during children's meals and snacks and their influence on children's physical activity was represented by a  $X^2$  value of 12.65 ( $df=9$ ). In this research, provider influence on children's physical activity is not related to provider activity during meals and snacks.

The relationship of participants' activity during children's outdoor play and their influence on children's physical activity is represented with a  $X^2$  value of 20.84 ( $df=9$ ). In

this research, provider influence on children’s physical activity is related to provider activity during children’s outdoor physical activity and was significant at the .01 probability level .

In regards to the relationship between providers’ meal arrangements for themselves at childcare and their influence on children’s physical activity, the value of  $X^2$  was 11.80 ( $df=9$ ). In this research, provider influence on children physical activity is not related to provider meal arrangements while at childcare.

### **Relationship of Psychological Factors to Providers’ Influence on Children’s Nutrition Education**

The relationship of participants’ psychological factors to children’s nutrition education is represented in Table 4.16.

Table 4.16 Relationship of Psychological Variables to Providers’ Influence on Children’s Nutrition Education N=120			
Variable	$X^2$	$df$	Sig.
Attitude/feeling toward childcare profession	9.83	6	.13
Attitude/feeling toward present job in childcare	14.32	12	.28
Self-concept	41.29	21	.00**
Quality of life	50.28	21	.00**
Provider activity during children’s meals/snacks	10.81	9	.29
Provider activity during children’s physical activity	14.86	9	.10
Provider meal arrangements at childcare	11.14	9	.27

\*Significant at p value <.05 \*\*Significant at p value <.01

The relationship between participants’ attitude/feeling toward the childcare profession and their influence on children’s nutrition education was represented with a  $X^2$  value of 9.83 ( $df=6$ ). In this research, providers’ influence on nutrition education is not related to their attitude/feeling toward the childcare profession.

In regards to the relationship between participants’ attitude/feeling toward their present job in childcare and their influence on nutrition education, the  $X^2$  value was 14.32 ( $df=12$ ). In

this research, providers' influence on nutrition education is not related to providers' attitude/feeling toward their present job in childcare.

In regards to the relationship between participants' self-concept and their influence on nutrition education, the  $X^2$  value was 41.29 ( $df=21$ ). In this research, participants' influence on nutrition education is related to providers' self-concept and was statistically significant at the .01 probability level.

The relationship between participants' quality of life and their influence on nutrition education was represented with a  $X^2$  value of 50.28 ( $df=21$ ). In this research, participants' influence on nutrition education is related to providers' quality of life and was statistically significant at the .01 probability level.

In regards to the relationship between participants' activity during meals and snacks and their influence on nutrition education, the  $X^2$  value was 10.81 ( $df=9$ ). In this research, participants' influence on nutrition education is not related to their activity during meals and snacks at childcare.

In regards to the relationship between participants' activity during children's physical activity and their influence on nutrition education, the  $X^2$  value was 14.86 ( $df=9$ ). In this research, provider influence on children's nutrition education is not related to provider activity during children's physical activity.

The relationship of participants' personal meal arrangements at childcare to their influence on nutrition education is represented by a  $X^2$  value of 11.14 ( $df=9$ ). In this research, providers' influence on nutrition education is not related to their personal meal arrangements while at childcare.

### Occupational Variables of Participants

Occupational variables of participants, including their tenure in childcare, the last nutrition workshop they attended, the number of children in their class, their participation in the Child and Adult Care Food Program (CACFP), and the licensed star-rating of their place of employment is represented in Table 4.17.

Table 4.17 Frequency and Percentage Distribution by Occupational Variables for Total Participants N=120		
Variable	No.	%
<b>Number of years employed in childcare</b>		
Less than 1 year	42	35.3
6 years to 10 years	35	29.4
11 years to 20 years	28	23.5
21 or more years	<u>14</u>	<u>11.8</u>
TOTAL	119	100.0
<b>Last nutrition workshop attended</b>		
0-6 months ago	38	33.9
7-12 months ago	32	28.6
13-24 months ago	13	11.6
25-36 months ago	14	12.5
More than 5 years ago	<u>15</u>	<u>13.4</u>
TOTAL	112	100.0
<b>No. of children in class</b>		
1-5	4	3.6
6-10	31	27.7
11-15	<u>77</u>	<u>68.8</u>
TOTAL	112	100.0
<b>Participation in CACFP</b>		
Yes	92	76.7
No	6	5.0
I don't know	<u>22</u>	<u>18.3</u>
TOTAL	120	100.0
<b>Star-rating of facility</b>		
5-star	51	43.6
4-star	49	41.9
3-star, 2-star, or 1-star	11	9.4
I don't know/facility not licensed under star system	<u>6</u>	<u>5.1</u>
TOTAL	117	100.0

### **Participants' Tenure in Childcare**

Of the participants, 42 (35.3 percent) had been employed in childcare for less than one year, 35 (29.4 percent) had been employed for 6 to 10 years, 28 (23.5 percent) had been employed for 11 to 20 years, and 14 (11.8 percent) had been working in childcare for 21 or more years. No participants indicated that they had been employed in childcare for 1 to 5 years.

### **Participants' Last Nutrition Workshop Attended**

The largest percentage of participants (33.9 percent, or 38 participants) indicated that they had attended a workshop within the last six months preceding the survey. Thirty-two participants (28.6 percent) said they had attended a workshop in the last 7 to 12 months, 13 (11.6 percent) said they had been at a nutrition workshop in the past 13-24 months, 14 (13.4 percent) said they had attended a nutrition workshop in the past 25 to 36 months, and 15 (13.4 percent) said the last nutrition workshop they attended was more than 5 years ago.

### **Number of Children in Participants' Class**

Of the participants, 77 (68.8 percent) had 11 to 15 children in their class. Of the remaining participants, 31 (27.7 percent) had 6 to 10 children in their class and 4 (3.6 percent) had 1-5 children in their class.

### **Facility Participation in the Child and Adult Care Food Program (CACFP)**

Ninety-two of the participants (76.7 percent) reported that the facility where they are employed participates in the CACFP. Of the remaining participants, 5.0 percent (6 participants) reported that their facility did not participate in the CACFP, and 22 (18.3 percent) did not know if their facility participated in the CACFP.

### Facility Star-rated License

The majority of participants (51, or 43.6 percent) said that the childcare facility where they were employed was a 5-star facility, 49 (41.9 percent) indicated that their place of employment was a 4-star facility, 11 (9.4 percent) listed their facility as 3-star, 2-star, or 1-star, and 6 respondents (5.1 percent) indicated that they did not know the star-rating of their facility or that the facility where they work is not licensed under the star-rated system.

### Relationship of Occupational Variables to Providers' Influence on Children's Weight

The relationship of the occupational variables on children's meals and snacks, physical activity and nutrition education are represented in Tables 4.18, 4.19, and 4.20.

### Relationship of Occupational Variables to Providers' Influence on Children's Nutritional Habits

The relationship of the occupational variables to children's meals and snacks is represented in Table 4.18.

Variable	$X^2$	<i>df</i>	Sig.
Number of years employed in childcare	9.77	6	.14
Last nutrition workshop attended	11.68	8	.17
Number of children in class	7.75	4	.10
Participation in CACFP	2.91	4	.57
Star-rated license of facility where employed	6.83	6	.34

\*Significant at p value <.05

The relationship of participants' tenure in childcare to their influence on children's nutritional habits is represented by a  $X^2$  value of 9.77 ( $df=6$ ). In this research, providers' influence on children's nutritional habits is not related to the number of years they have been employed in childcare.

The relationship between the last nutrition workshop attended by the participants and their influence on children’s nutritional habits was represented by a  $X^2$  value of 11.68 ( $df=8$ ). In this research, providers’ influence on children’s nutritional habits is not related to the length of time since they attended a nutrition workshop.

In regards to the relationship between the number of children in the participants’ class and their influence on children’s nutritional habits, the  $X^2$  value was 7.75 ( $df=4$ ). In this research, providers’ influence on children’s nutritional habits is not related to the number of children in providers’ classes.

The  $X^2$  value of the relationship between participants’ childcare employer participating in the CACFP (Child and Adult Care Food Program) and their influence on children’s nutritional habits was 2.91 ( $df=4$ ). In this research, influence on children’s nutritional habits is not related to a facility’s participation in the CACFP.

In regards to the relationship between the star-rated license of the participants’ employers and participants’ influence on children’s nutritional habits, the  $X^2$  value was 6.83 ( $df=6$ ). In this research, participants’ influence on children’s nutritional habits is not related to a childcare facility’s star-rated license.

**Relationship of Occupational Variables to Providers’ Influence on Children’s Physical Activity**

The relationship of the occupational variables to providers’ influence on children’s physical activity is represented in Table 4.19.

Variable	$X^2$	$df$	Sig.
Number of years employed in childcare	14.36	9	.11

**Table 4.19 (continued)**

Last nutrition workshop attended	15.82	12	.20
Number of children in class	12.12	6	.06
Participation in CACFP	3.59	6	.73
Star-rated license of facility where employed	4.12	9	.90

\* Significant at p value < .05

The relationship of participants' tenure (number of years employed) in childcare to their influence on children's physical activity is represented by a  $X^2$  value of 14.36 ( $df=9$ ). In this research, providers' influence on children's physical activity is not related to participants' tenure in childcare.

The relationship of the length of time since participants attended a nutrition workshop and their influence on children's physical activity is represented with a  $X^2$  value of 15.82 ( $df=12$ ). In this research, providers' influence on children's physical activity is not related to the length of time since the participants had attended a nutrition workshop.

In regards to the relationship between the number of children in the participants' classes and their influence on children's physical activity, the  $X^2$  value was 12.12 ( $df=6$ ). In this research, providers' influence on children's physical activity is not related to the number of children in providers' classrooms.

The relationship between participation in the CACFP and participants' influence on children's physical activity is represented with a  $X^2$  value of 3.59 ( $df=6$ ). In this research, providers' influence on children's physical activity is not related to their childcare employer's participation in the CACFP.

The value of  $X^2$  that represents the relationship between participants' influence on children's physical activity and the star-rated license of the childcare facility where they are employed is 4.12 ( $df=9$ ). In this research, providers' influence on children's physical activity is not related to the star-rated license of the childcare facility where they are employed.

## Relationship of Occupational Variables to Providers' Influence on Children's Nutrition Education

The relationship of the occupational variables to providers' influence on children's nutrition education is represented in Table 4.20.

Variable	$X^2$	$df$	Sig.
Number of years employed in childcare	9.82	9	.37
Last nutrition workshop attended	7.64	12	.81
Number of children in class	18.32	6	.01**
Participation in CACFP	3.45	6	.75
Star-rated license of facility where employed	6.35	9	.70

\*Significant at p value <.05    \*\* Significant at p value < .01

The relationship between participants' tenure and their influence on children's nutrition education is represented by a  $X^2$  value of 9.82 ( $df=9$ ). In this research, providers' influence on nutrition education is not related to their number of years employed in childcare.

Regarding the relationship between the length of time since participants attended a nutrition workshop and providers' influence on nutrition education, the  $X^2$  value was 7.64 ( $df=12$ ). In this research, providers' influence on nutrition education is not related to their attendance at a nutrition workshop.

The relationship between the number of children in a provider's class and their influence on nutrition education is represented by  $X^2=18.32$  ( $df=6$ ). In this research, providers' influence on nutrition education is related to the number of children in their class and is significant at the .01 probability level.

The relationship between participants' influence on nutrition education and their facility's participation in the CACFP is represented by a  $X^2$  value of 3.45 ( $df=6$ ). In this research,

providers' influence on nutrition education is not related to their facility's participation in the CACFP.

In regards to the relationship between participants' influence on nutrition education and the star-rated license of the childcare facility where they are employed, the  $X^2$  value was 6.35 ( $df=9$ ). In this research, providers' influence on nutrition education is not related to the star-rated license of the facility where they are employed.

### **Childcare Providers' Perceptions of Their Role in the Prevention of Obesity in Early Childhood**

Childcare providers' perceptions of their role in the prevention of obesity in early childhood are represented in Tables 4.21, 4.22, 4.23, and 4.24.

### **Childcare Providers' Perceptions of Their Role in Providing Healthy Meals and Snacks**

Childcare providers' perception of their role in providing healthy meals and snacks is represented in Table 4.21.

Table 4.21 Frequency and Percentage Distribution of Importance Providers Place on Serving Nutritious Meals & Snacks for Total Participants	No.	%
<b>As a childcare provider, the importance I place on serving children meals and snacks that I would consider to be nutritious is:</b>		
It is very important to me	99	83.2
It is somewhat important to me	20	16.8
It is somewhat unimportant to me	0	0.0
It is very unimportant to me	0	0.0
<b>TOTAL</b>	<u>119</u>	<u>100.0</u>

Childcare providers place a great deal of importance on serving healthy meals and snacks to the children in their care: 99 (83.2 percent) indicated it was very important to them and 20 (16.8 percent) said it was somewhat important to them. No participants answered that serving healthy meals and snacks was somewhat unimportant or very unimportant to them.

**Childcare Providers’ Perceptions of Their Role in Helping Children Receive Sufficient Physical Activity**

Childcare providers’ perception of their role in helping children receive sufficient physical activity is represented in Table 4.22.

Table 4.22 Frequency and Percentage Distribution of Importance Providers Place on Children Receiving Sufficient Physical Activity Each Day	No.	%
<b>As a childcare provider, the importance I place on children receiving what I consider to be sufficient physical activity each day is:</b>		
It is very important to me	101	84.9
It is somewhat important to me	17	14.3
It is somewhat unimportant to me	0	0.0
It is very unimportant to me	<u>1</u>	<u>.8</u>
<b>TOTAL</b>	119	100.0

Most of the participants (101 individuals, or 84.9 percent of all respondents) indicated that children receiving sufficient physical activity each day was very important to them. Seventeen participants (14.3 percent) said that it was somewhat important to them. No participants indicated that the children having sufficient physical activity each day was somewhat unimportant to them, but one participant (.8 percent) indicated that it was very unimportant.

**Childcare Providers’ Perceptions of Their Role in Helping Children Receive Appropriate Nutrition Education in Their Early Childhood Curriculum**

The important participants place providing appropriate nutrition education curriculum to children is represented in Table 4.23.

Table 4.23 Frequency and Percentage Distribution of Importance Providers Place on Children Receiving Appropriate Nutrition Education in Their Curriculum	No.	%
<b>As a childcare provider, the importance I place on children receiving appropriate nutrition education in their early childhood curriculum is:</b>		
It is very important to me	85	71.4
It is somewhat important to me	33	27.7
It is somewhat unimportant to me	0	0.0
It is very unimportant to me	<u>1</u>	<u>.8</u>
<b>TOTAL</b>	<b>119</b>	<b>100.0</b>

Participants in the research placed a great deal of importance on providing the children in their care with appropriate nutrition education: 85 participants (71.4 percent) said that it was very important to them, while 33 participants (27.7 percent) said it was somewhat important to them. One participant (.8 percent) indicated that providing appropriate nutrition education to the children in their care was very unimportant to them.

**Childcare Providers’ Perception of Their Behaviors as a Role Model to Children in Regards to Nutrition and Physical Activity**

Childcare providers’ perception of their behaviors as a role model to the children in their care in regards to nutrition and physical activity is represented in Table 4.24.

Table 4.24 Frequency and Percentage Distribution of Providers’ Behaviors as a Role Model for Children in Regards to Nutrition and Physical Activity	No.	%
<b>I would describe my personal eating habits as:</b>		
I eat healthy foods all the time, as described by the FGP	3	2.5
I usually eat healthy foods, as described by the FGP	78	65.0
I infrequently eat healthy foods, as described by the FGP	34	28.3
I almost never or never eat healthy foods, as described by the FGP	<u>5</u>	<u>4.2</u>
<b>TOTAL</b>	<b>120</b>	<b>100.0</b>
<b>I would describe my personal physical activity pattern as:</b>		
sedentary	36	30.0
moderately active	78	65.0
vigorously active	<u>6</u>	<u>5.0</u>
<b>TOTAL</b>	<b>120</b>	<b>100.0</b>

Seventy-eight (65.0 percent) of participants indicated that they usually eat healthy foods. Another 28.3 percent (34 participants) said they infrequently eat healthy foods. A greater number of participants (5, or 4.2 percent) indicated they almost never or never eat healthy foods than those that said eat healthy foods all the time (3 participants, or 2.5 percent).

In regards to providers' personal physical activity, 78 (65.0 percent) indicated they were moderately active. Thirty-six participants (30.0 percent) described their personal physical activity pattern as sedentary, and six participants (5.0 percent) said they were vigorously active.

### **Summary**

The purpose of this study was to investigate how childcare providers perceive their role in preventing obesity in early childhood, how socio-demographic, physical, psychological and organizational factors of providers affect their perceptions of their influence on children being overweight in early childhood, and how much influence they perceive they have in influencing children's weight.

### **Participants**

One hundred-twenty childcare providers participated in this research. They completed surveys in early childhood courses at the five westernmost community colleges in North Carolina in February, 2006. Surveys were completed in online and paper formats.

Most of the participants (97.5 percent) were female and white/Caucasian (95.8 percent). The biggest percentage (31.4 percent) were 20 to 29 years of age. Nearly half (46.7 percent) had attained a GED, high school diploma, or had some college coursework. One hundred-eleven (96.5 percent) of the participants had an annual household income of \$30,000 or less.

## **The Relationship of Demographic, Physical, Psychological, and Organizational Factors of Providers to Providers' Influence on Children's Nutritional Practices, Physical Activity, and Nutrition Education**

The relationship of demographic, physical, psychological and organizational factors of participants to their influence on children's nutritional habits, physical activity patterns, and nutrition education were measured using a cross tabulation and the  $X^2$  test of independence. Significant relationships were indicated between 1) race and providers' influence on children's nutritional habits 2) providers' attitude/feeling toward the childcare profession and providers' influence on children's nutritional habits 3) provider activity during children's physical activity and providers' influence on children's physical activity 4) providers' self-concept and provider influence on children's nutrition education 5) providers' quality of life and provider influence on children's nutrition education and 6) number of children in a class and provider influence on nutrition education.

## **Childcare Providers' Perceptions of Their Role in the Prevention of Obesity in Early Childhood**

Childcare providers indicated that they felt it was important to serve nutritious meals and snacks: 83.2 percent said it was very important to them. They also placed importance on helping children be physically active. Of the participants, 84.9 percent responded that it was very important to them that children receive sufficient physical activity. In regards to nutrition education, 71.4 percent of participants said it was very important to them that children receive appropriate nutrition education as a part of the early childhood curriculum.

### **Amount of Influence Providers Perceive They Have on Obesity in Early Childhood**

Typically, providers are able to affect children's weight through the day-to-day activities of meals and snacks, physical activity, and nutrition education, and so the research question was addressed by asking participants to indicate the amount of influence they have in those three areas.

Thirty-five participants (29.4 percent) felt they had very high influence on children's nutritional habits, while another 51 respondents (42.9 percent) believed their influence on nutritional habits was somewhat high. Thirty-three respondents (27.7 percent) perceived their influence to be moderate to low.

Of the participants, 95.8 percent perceived their influence on children's physical activity as moderate to very high: forty-four respondents (37.0 percent) indicated that their influence on children's physical activity was very high, 42 (35.3 percent) responded that their influence was somewhat high, and twenty-eight participants (23.5 percent) believed their influence on physical activity was moderate. Five participants (4.2 percent) felt that their influence was somewhat low or low.

In regards to nutrition education, 35 (29.2 percent) participants indicated that they perceived their influence to be very high. Fifty participants (41.7 percent) believed their influence in nutrition education was somewhat high, and 31 (25.8 percent) said their influence was moderate. Four participants (3.3 percent) said their influence in the area of nutrition education was somewhat low or low.

## CHAPTER 5

### Summary, Conclusions, Implications, and Recommendations

Childcare providers care for, nurture, and supervise young children on a daily basis. This study was designed and conducted to investigate how various characteristics of providers affect their perceptions of their influence on obesity in early childhood, what providers' perceptions are of their role in the prevention of obesity in early childhood in regards to providing healthy meals and snacks, promoting physical activity, providing nutrition education, and serving as a role model in regards to nutrition and physical activity, and how much influence providers perceive they have on children's weight.

Childcare providers enrolled in early childhood education courses at the five westernmost community colleges comprised the sample. A 50-item survey instrument was administered face-to-face and online to the participants. The data were analyzed using frequencies, percentages, and a test of relationship ( $X^2$ ). A descriptive analysis of the data was completed. This chapter provides conclusions from the findings of this research along with implications and recommendations for further study.

#### Purpose of the Study

The following research questions guided this study:

1. How do socio-demographic factors of providers, including age, educational level, gender, ethnic background, and socio-economic status affect providers' perceptions of their influence on obesity in early childhood?
2. How do physical factors of providers, including weight, eating habits, and physical activity patterns affect providers' perceptions of their influence on obesity in early childhood?

3. How do psychological factors of providers, including attitudes toward child-care, self-concept, quality of life, and serving as a role model to children affect providers' perceptions of their influence on obesity in early childhood?
4. How do organizational factors of providers, including tenure, training, size of class, participation in the CACFP, and facility licensing rating affect providers' perceptions of their influence on obesity in early childhood?
5. What are childcare providers' perceptions of their role in the prevention of obesity in early childhood, in regards to:
  - A. providing healthy meals and snacks?
  - B. promoting appropriate nutrition education?
  - C. promoting physical activity?
  - D. serving as a role model for children in regards to nutrition and physical activity?
6. How much influence do providers perceive that they have in regards to influencing children's weight?

### **Conclusions and Implications**

The conclusions and implications based on the findings of this study are provided in this section, and are relevant to the population from which it is drawn.

#### **Conclusion 1 Providers' ethnic background influences their perceptions of their influence on children's meals and snacks.**

In this research, there was a relationship between participants' ethnic background and their perceived influence on children's meals and snacks. There are differences in obesity rates for children from various ethnic backgrounds (NHANES IV, CDC, 2000) and children

from different ethnic groups vary in their levels of and opportunities for physical activity (Anderson et al., 1998; Lindquist et al., 1999). Children are raised in families with various ethnic- and culturally-related beliefs, attitudes, values, and traditions, many of which influence food and nutrition. Childcare providers, too, come from many different ethnic backgrounds, which may influence their ideas and beliefs about food and nutrition as well as their role in providing meals and snacks.

Education and training for childcare providers should consider the importance of ethnic background as an influential factor in how providers perceive their role in providing children with nutritious meals and snacks. Training should be culturally respectful and sensitive, yet mindful of differences in how individuals may perceive their influence on children's nutritional practices.

**Conclusion 2 Providers' weight, eating habits and physical activity patterns did not impact their perceptions of how they influenced young children's weight.**

Over half of participants (56.7 percent) described themselves as overweight or slightly overweight. Sixty-five percent of participants said they usually eat healthy foods and sixty-five percent described themselves as moderately active. These personal physical characteristics of providers were not related to how they perceived their influence on children's weight, in regards to meals and snacks, physical activity, and nutrition education.

Education and training for providers should emphasize the power of modeling healthy habits for children since, in this research, providers do not appear to connect their own behaviors with their influence on children's weight. As noted by Lytle et al. (1997), adult actions are more important than words in influencing children's eating behavior. Additionally, Klesges et al. (1990) found adult participation and modeling to be the most

important factor in affecting children's physical activity, especially children who were at-risk for being overweight.

**Conclusion 3 Providers' attitudes towards the childcare profession impacted how they viewed their influence on children's meals and snacks.**

In this research, 96.7 percent of participants described their feeling/attitude toward the early childhood profession as "very positive" or "somewhat positive." In describing their influence on children's nutritional practices (meals and snacks), 72.3 percent said they had "very high" or "somewhat high" influence on children's meals and snacks.

Past research has indicated that providers influence children's meals and snacks: Briley, Roberts-Gray, and Simpson (1994) found that staff knowledge and perceptions of children's food preferences were factors in menu selection and Hayden (2002) noted the importance of staff knowledge in improving children's nutrition at childcare. Drake (1992) found that providers had a strong knowledge base in some areas of nutrition planning, but lacked information in other areas. In a study by Briley et al. (1989), providers expressed unanimous positive attitudes about nutrition, showing an awareness of the importance of provider's knowledge about nutrition and appropriate practices related to serving children meals.

In planning menus and serving meals and snacks to children, providers who feel positively about the early childhood profession may be better equipped to influence children's meals and snacks. Further study could attempt to identify the specific mechanism that links positive feelings about the profession to influence on meals and snacks, such as providers' sense of empowerment, providers' sense of occupational pride, or providers' enjoyment of their job.

**Conclusion 4 Providers' self-concept and quality of life impacted their perceptions of their influence on nutrition education.**

Nutrition education is often quite effective with preschool-age children because of their enthusiasm for learning new things and because their habits are not yet firmly established (Levy & Cooper, 1999). Therefore, it is important that childcare providers be equipped to provide nutrition at this important age. Providers who have positive self-concepts and quality of life may be more able to deliver the “positive” nutrition education advocated by Lytle et al. (1997) and Murphy et al. (1995) because they have positive attitudes about themselves and their lives, which translates into a positive approach to nutrition education. Training and education for childcare providers that is research-based and current is essential to appropriate nutrition education for childcare providers (Briley & Roberts-Gray, 1999). Providers who have positive self-concepts and quality of life may be more motivated to seek and attend training, which may increase their feelings of professionalism and ultimately, their self-concepts. In the process, they learn about nutrition education, and this translates into more effective nutrition activities in the classroom. In this research, providers felt less influential in the area of nutrition education than in meals and snacks or physical activity. Since self-concept and quality of life appear to be related to nutrition education, training for childcare providers might take into account this connection and approach nutrition accordingly.

**Conclusion 5 Providers' activities/tasks during children's outdoor play influenced how they viewed their influence on the children's physical activity.**

There was a relationship between participants' activity during children's physical activity and their perceived influence on children' physical activity. This conclusion is

supported by the research of Klesges et al. (1990) who noted that adult participation and modeling of appropriate physical activity may be the strongest determinant of preschoolers' physical activity, particularly for those children at risk for being overweight. The research of LaMaster et al. (1998) indicates that physically active teachers typically encourage children more in their physical activity, offer more opportunities to be physically active, and provide more instruction than their more sedentary colleagues. Campbell (1997) noted that gross motor development programs often suffer when teachers do not focus on specific skills and when the instructional style is teacher-centered, rather than child-centered and play-based.

Training for childcare providers should build on the foundation of perceived influence in this area, emphasizing the integral role of the provider in implementing an appropriate physical education program for young children and the importance of participating with children in physical activity.

**Conclusion 6 Class size impacted how providers viewed their influence on nutrition education.**

In this study, class size affected how providers perceived their influence on nutrition education. Nutrition education, like other areas of the early childhood curriculum, is generally approached with “hands-on” methodology and should begin in the preschool years (Murphy et al. 1995). Food and nutrition-related activities like gardening, cooking and food preparation, and tasting/sampling events help children learn about food through their senses (Drake, 1992; Fuhr & Barclay, 1998; Rothlein, 1989). Research by Gillis and Sabry (1980) indicated that teachers often avoided nutrition-related activities like snack preparation, tasting, food-related field trips, and gardening, which could be difficult

with a larger class size since young children require intense supervision and assistance with hands-on activities.

Briley and Roberts-Gray (1999) note that childcare providers need current, research-based information and training focused on nutrition education and research by Murphy et al. (1995) and Zemel et al. (1993) indicate that a majority of teachers are interested in learning about nutrition.

This study indicates that along with this information, providers also need practical strategies that enable them to implement developmentally appropriate nutrition education within classrooms of various sizes. This could take the form of a workshop on group or container gardening or a session on heatless “cooking” activities with preschoolers. An emphasis on activities that can be completed simply and quickly with several children simultaneously, would likely address providers’ concerns and needs.

**Conclusion 7 Childcare providers placed greater emphasis on guiding children’s nutritional practices (meals and snacks) and physical activity than on providing nutrition education.**

In this research, 83.2 percent of participants said it was very important to them to serve nutritious meals and snacks to children and 84.9 percent said it was very important to them that children receive sufficient physical activity each day. Nutrition education did not have the same degree of importance placed on it by providers: 71.4 percent said it was very important to them that children receive appropriate nutrition education in their early childhood curriculum.

Possibly, less emphasis on nutrition education could stem from providers feeling uncertain or unconfident about their own knowledge of nutrition education principles: Gillis

and Sabry (1980) tested preschool teachers' knowledge of nutrition principles and found a mean score of just over 50 percent. Providers could feel more competent about serving healthy meals and snacks and participating in physical activity than in providing nutrition education. This issue could be addressed with increased training and education for providers: Briley and Roberts-Gray (1999) note the importance of providers receiving appropriate training to implementation of nutrition education curriculum. Another confounding factor for emphasizing nutrition education may be lack of materials. Zemel et al. (1993) found that most teachers made their own materials or borrowed them from colleagues. A lack of time or supplies may inhibit providers from constructing materials to support nutrition education curriculum, while physical activity and meals and snacks usually do not require providers to make props or materials themselves.

**Conclusion 8 A majority of providers are healthy role models in that they usually or always eat healthy foods and are moderately or vigorously active.**

In this research, 67.5 percent of participants said they always or usually eat healthy foods and 70 percent of participants described themselves as moderately or vigorously active.

Adult role models are important in the development of children's healthy behaviors, as noted by Briley and Roberts-Gray (1999), Crockett and Sims (1995), Thomas, Pfeil and Guerra (1997) and Lytle et al. (1997). Providers are important to improving children's nutrition, according to Hayden (2002), who advocated increasing providers' knowledge of food values, food preparation skills and encouraging positive attitudes about health habits. LaMaster, McKenzie, Marshall, and Sallis (1998) found that teachers who were physically active in their own personal lives tended to encourage, plan, and offer children more physical activity than their sedentary colleagues.

Nutrition and physical activity training should acknowledge and encourage providers' healthy habits and help them make the connection between their personal nutrition and physical activity and how those lifestyle choices might influence the children in their care. Childcare facilities can encourage providers to adopt or maintain healthy practices by developing incentives, offering health-related educational programs, and providing ongoing encouragement to their employees.

**Conclusion 9 Childcare providers perceived their influence on children's weight to be greatest in the area of physical activity.**

Childcare providers perceived their influence to be higher on children's physical activity than on their daily nutritional practices or nutrition education, with 37 percent of participants describing their influence on children's physical activity as "very high" and 95.8 percent of participants responding that their influence on physical activity was moderate to very high. Of the participants in this research, 70% described themselves as "moderately active" or "vigorously active" which indicates that a majority of the participants are personally active. Providers' own levels of physical activity could potentially affect how they influence children's physical play, according to LaMaster et al. (1998). As noted by Javernick (1988), children are drawn to activities when their teachers participate.

It is possible that participants felt a greater degree of influence over physical activity because planning and implementation of children's physical activities typically occurs at the classroom level, while planning and implementation of meal and snack menus and nutrition education may occur outside of the classroom (such as when an administrator or chef designs a menu for the facility or a director selects a nutrition curricula to be used by teachers).

Training for providers should build on providers' perception of their influence on physical activity by emphasizing the role of adults in helping children build physical activity and gross motor skills by participating with children and guiding their play appropriately. Training that encourages providers to share their own physical activity skills and interests with children would also be appropriate.

### **Recommendations for Future Research**

This study should be replicated using participants from more geographic locales, with increased diversity among the participants, particularly in regards to ethnic background and gender. Because this research was limited to childcare providers who were enrolled in early childhood courses at community colleges, research that includes providers who are not enrolled in school would also be useful. A survey format was used for this research, but the investigator recognizes the value of an interview format for clarification of questions and answers, as well as for additional detail.

This research attempted to look at how providers influenced children's meals and snacks, physical activity, and nutrition education and their influence as a role model. While this approach yielded data that are useful for comparison, the researcher would recommend that future studies be focused on a single area of influence in order to glean more in-depth responses.

Further research is also needed that delves into the implications and practical applications of the findings of this research. Examples of further study include an investigation of the specific mechanisms by which ethnic background is related to influence on children's meals and snacks, the specific mechanisms that relate providers' feelings about the childcare profession to their perceptions of their influence on meals and snacks, why providers

perceive their influence on nutrition education to be lower than that of meals and snacks and physical activity, and how class size can be addressed so that providers feel they can extend nutrition education past mealtimes and into other areas of the curriculum and environment.

### **Recommendations for Educators**

This research has implications for educators of childcare providers, both in formal settings, such as universities and community colleges, and in non-formal settings, such as training, conferences, and continuing education.

Educational efforts for childcare providers should recognize the role and influence they have in combating the obesity problem. As educators who spend many hours with children whose lifelong eating and physical activity habits have not yet been established, childcare providers have a unique opportunity to influence and impact children's weight. In order to be a positive influence, childcare providers must receive current, research-based information and training that enables them to offer children nutritious meals and snacks, vigorous physical activity, and appropriate nutrition education curriculum. Educational efforts must focus on the importance of modeling, as the provider is a role model for children. Past research indicates that childcare providers have interest and motivation in regards to health- and nutrition-related education for children, but often lack knowledge that is needed to implement an effective curriculum. Educators should take this into account and ensure that courses and training contain both content and methodology for teaching children habits that will help them maintain a healthy weight throughout life.

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## APPENDIX

The purpose of this survey is to study how childcare providers perceive their influence on obesity in the early childhood years. Please answer all of the questions. Your answers will not be individually identifiable and will remain confidential.

To return this completed survey via email, please send it as an email attachment to [marna.holland@asheville.k12.nc.us](mailto:marna.holland@asheville.k12.nc.us) by March 3, 2006. If you are completing the survey during class, please give the survey back to your instructor when you are finished. Thank you for your participation in this research.

1. My current employment status in childcare is:

- A. I am currently employed in a childcare facility.
- B. I am not currently employed in a childcare facility.

2. I have been employed in the childcare profession for:

- A. less than 1 year
- B. 1 year to 5 years
- C. 6 years to 10 years
- D. 11 years to 20 years
- E. 21 years to 30 years
- F. 31 years or more

3. My current position is:

- A. Teacher Assistant
- B. Classroom Teacher
- C. Lead Teacher
- D. Director or Assistant Director
- E. Other: \_\_\_\_\_

4. The type of childcare facility where I am employed is:

- A. for-profit center
- B. government-operated or non-profit center
- C. religious-affiliated center
- D. family child care home

5. The “star-rating” of the childcare facility where I am employed is:

- A. 5-star
- B. 4-star
- C. 3-star
- D. 2-star
- E. 1-star
- F. I don't know/facility is not licensed under the star-rated system

6. The number of employees at the childcare facility where I work is:

- A. 1-4 employees
- B. 5-10 employees
- C. 11-15 employees
- D. 16-20 employees
- E. 21 or more employees

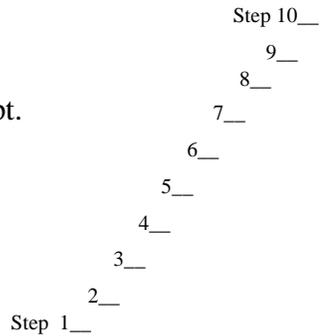
7. The age of child I am primarily assigned to teach is:

- A. infants
- B. toddlers
- C. 2-year-olds
- D. 3-year-olds
- E. 4 & 5 year olds
- F. school-age children

8. The number of children in my class is:

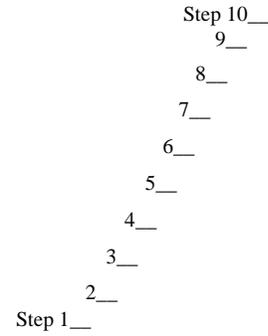
- A. 1-5
- B. 6-10
- C. 11-15
- D. 16-20
- E. 21-25

9. Think of an individual who has a poor self-concept. That person would be on step 1 of the scale to the right. A person with a great self-concept would be on step 10 of the scale on the right. With "1" being a poor self-concept, and "10" being a great self-concept, please rate yourself on the scale:



- A. Step 1
- B. Step 2
- C. Step 3
- D. Step 4
- E. Step 5
- F. Step 6
- G. Step 7
- H. Step 8
- I. Step 9
- J. Step 10

10. Think of an individual with a poor quality of life. That person would be on step 1 of the scale to the right. A person with a great quality of life would be on step 10 of the scale on the right. With “1” being a poor quality of life, and “10” being a great quality of life, rate your personal quality of life on the scale at the right:



- A. Step 1
- B. Step 2
- C. Step 3
- D. Step 4
- E. Step 5
- F. Step 6
- G. Step 7
- H. Step 8
- I. Step 9
- J. Step 10

11. Generally, my feeling/attitude toward the early childhood profession is:

- A. Very positive
- B. Somewhat positive
- C. Neutral
- D. Somewhat negative
- E. Very negative

12. Generally, my feeling/attitude toward my present job in childcare is:

- A. Very positive
- B. Somewhat positive
- C. Neutral
- D. Somewhat negative
- E. Very negative

13. I would describe my own weight as:

- A. very underweight for my height and frame.
- B. slightly underweight for my height and frame
- C. normal weight for my height and frame.
- D. slightly overweight for my height and frame.
- E. very overweight for my height and frame.

14. I would describe my personal physical activity pattern as:

- A. sedentary (little to no vigorous physical activity, with “vigorous physical activity” defined as expending calories at a higher rate than normal & requiring the individual to breathe hard)
- B. moderately active (vigorous physical activity on 3 to 4 of 7 days, with “vigorous physical activity” defined as expending calories at a higher rate than normal & requiring the individual to breathe hard)
- C. vigorously active (vigorous physical activity on 5 to 7 of 7 days, with “vigorous physical activity” defined as expending calories at a higher rate than normal & requiring the individual to breathe hard).

15. I would describe my personal eating habits as:

- A. I eat healthy foods all the time, as described by the Food Guide Pyramid.
- B. I usually eat healthy foods, as described by the Food Guide Pyramid.
- C. I infrequently eat healthy foods, as described by the Food Guide Pyramid.
- D. I almost never eat healthy foods, as described by the Food Guide Pyramid.
- E. I never eat healthy foods, as described by the Food Guide Pyramid.

16. I would describe the weight of the children I work with on a daily basis as:

- A. a majority (50% or more) of children underweight for their age
- B. a majority (50% or more) of children normal weight for their age
- C. a majority (50% or more) of children overweight for their age
- D. I don't know

17. The childcare facility where I am employed participates in the CACFP (Child and Adult Care Food Program):

- A. Yes
- B. No
- C. I don't know

18. At the childcare facility where I work, the meals are prepared by:

- A. a cook/chef or foodservice staff at our facility
- B. by the childcare staff
- C. meals are brought from home for children
- D. meals are catered by an outside source and delivered to the facility each day
- E. other arrangement/I don't know

19. Please rank the following factors that influence menus at the childcare facility where you work, with “1” being the greatest influential factor and “6” being the least influential factor.

- \_\_\_\_\_ A. cost of food
- \_\_\_\_\_ B. nutritional quality of food
- \_\_\_\_\_ C. children’s preferences/acceptance of food
- \_\_\_\_\_ D. regulations
- \_\_\_\_\_ E. ease of preparation
- \_\_\_\_\_ F. other: \_\_\_\_\_

20. For 50% or more of the meals that I eat while working at childcare, I:

- A. eat the same foods served to the children
- B. bring a bag/sack lunch from home
- C. order out from a restaurant for pick-up or delivery
- D. skip most meals at work
- E. none of the above/other

21. While the children are eating meals, 50% or more of the time I am:

- A. eating “family-style” with the children
- B. cleaning or straightening the room
- C. serving/supervising the children and circulating around the dining tables
- D. other

22. On three of every five days at the childcare facility where I work, I feel that the snacks that are served to the children are:

- A. very healthy, according to the Food Guide Pyramid
- B. somewhat healthy, according to the Food Guide Pyramid
- C. somewhat unhealthy, according to the Food Guide Pyramid
- D. very unhealthy, according to the Food Guide Pyramid

23. The last training workshop on nutrition that I attended for my job was:

- A. 0-6 months
- B. 7-12 months
- C. 13-24 months
- D. 25-36 months
- E. more than 5 years ago

24. Nutrition education, in the facility where I work, is generally:

- A. integrated throughout the year into the daily curriculum
- B. the subject of a planned theme or unit, lasting a few days or a week
- C. not part of our curriculum
- D. other \_\_\_\_\_

25. Of the nutrition education materials in our childcare facility, 50% or more of the materials are:

- A. made by teachers/parents/volunteers
- B. purchased from a commercial company
- C. we do not have any nutrition education materials

26. On three of five days at the facility where I work, the children in my care are engaged in vigorous physical activity (defined as activity that expends calories at a higher rate than normal & requires the individual to breathe hard) for:

- A. less than 30 minutes
- B. 30 minutes to 1 hour
- C. 1 hour to 2 hours
- D. more than 2 hours

27. Please rank the following factors in determining how physically active children are in outside play in childcare, with "1" being the greatest influential factor, and "5" being the least influential factor:

- \_\_\_\_\_ A. the weather
- \_\_\_\_\_ B. the play equipment/playground equipment
- \_\_\_\_\_ C. teacher involvement
- \_\_\_\_\_ D. personalities/temperaments of individual children
- \_\_\_\_\_ E. other factors

28. On three of five days, while the children in my care are playing outside, I am:

- A. actively playing with the children in the play space/on the playground
- B. sitting/standing with co-workers, supervising children
- C. sweeping, raking or otherwise cleaning/straightening the outdoor play space
- D. other

29. On three of five days, I feel that the vigorous physical activity (defined as activity which expends calories at a higher rate than normal and requires the individual to breathe hard) that the children in my care engage in is:

- A. an inadequate amount of time for their age and development
- B. an adequate/appropriate amount of time for their age and development
- C. an excessive (too much) amount of time for their age and development

30. For 50% or more of the children in my care, I believe that the person who has the greatest influence on their eating habits is/are:

- A. parents/guardians
- B. siblings
- C. childcare provider/teacher
- D. peers
- E. grandparents
- F. others: \_\_\_\_\_

31. For 50% or more of the children in my care, I believe that the person who has the greatest influence on their physical activity patterns is/are:

- A. parents/guardians
- B. siblings
- C. childcare provider/teacher
- D. peers
- E. grandparents
- F. others: \_\_\_\_\_

32. As a childcare provider, the importance I place on assisting children in maintaining a healthy weight is:

- A. It is very important to me
- B. It is somewhat important to me
- C. It is somewhat unimportant to me
- D. It is very unimportant to me

33. As a childcare provider, the importance I place on assisting overweight children in losing weight is:

- A. It is very important to me
- B. It is somewhat important to me
- C. It is somewhat unimportant to me
- D. It is very unimportant to me

34. As a childcare provider, the importance I place on serving children meals and snacks that I would consider to be nutritious is:

- A. It is very important to me
- B. It is somewhat important to me
- C. It is somewhat unimportant to me
- D. It is very unimportant to me

35. As a childcare provider, the importance I place on children receiving what I consider to be sufficient physical activity each day is:

- A. It is very important to me
- B. It is somewhat important to me
- C. It is somewhat unimportant to me
- D. It is very unimportant to me

36. As a childcare provider, the importance I place on children receiving appropriate nutrition education in their early childhood curriculum is:

- A. It is very important to me
- B. It is somewhat important to me
- C. It is somewhat unimportant to me
- D. It is very unimportant to me

37. I would describe my influence as a childcare provider on the nutritional habits of the children in my care as:

- A. Very high influence
- B. Somewhat high influence
- C. Moderate influence
- D. Somewhat low influence
- E. Very low influence
- F. No influence

38. I would describe my influence as a childcare provider on the physical activity habits of the children in my care as:

- A. Very high influence
- B. Somewhat high influence
- C. Moderate influence
- D. Somewhat low influence
- E. Very low influence
- F. No influence

39. I would describe my influence as a childcare provider on the nutrition education that the children in my care receive as:

- A. Very high influence
- B. Somewhat high influence
- C. Moderate influence
- D. Somewhat low influence
- E. Very low influence
- F. No influence

40. I would describe my influence on a child's diet and physical activity when the child is at home and not in my care as:

- A. Very high influence
- B. Somewhat high influence
- C. Moderate influence
- D. Somewhat low influence
- E. Very low influence
- F. No influence

41. Within the childcare facility where I am employed, the person(s) I perceive as having the greatest influence on the foods served for children's meals and snacks is:

- A. the center director
- B. the lead teacher in each classroom
- C. the children's parents/families
- D. the individual children
- E. the cook/chef/kitchen staff
- F. other: \_\_\_\_\_
- G. I work alone in a family child care home

42. Within the childcare facility where I am employed, the person I perceive as having the greatest influence on nutrition education curriculum is:

- A. the center director
- B. the lead teacher in each classroom
- C. the children's parent/family
- D. the individual children
- E. the cook/chef/kitchen staff
- F. other: \_\_\_\_\_
- G. I work alone in a family child care home

43. Within the childcare facility where I am employed, the person I perceive as having the greatest influence on the physical activity of the children is:

- A. the center director
- B. the lead teacher in each classroom
- C. the children's parent/family
- D. the individual children
- E. the cook/chef/kitchen staff
- F. other: \_\_\_\_\_
- G. I work alone in a family child care home

44. A child's developmental domains are listed below. Please rank each domain, based on the emphasis that you believe the staff at the childcare facility where you are employed places on that domain, with "1" being the greatest emphasis and "3" being the least emphasis.

- \_\_\_\_ A. cognitive/intellectual domain
- \_\_\_\_ B. social/ emotional domain
- \_\_\_\_ C. physical domain

45. My gender is:

- A. Female
- B. Male

46. My race is:

- A. White/Caucasian
- B. Black/African-American
- C. Native American
- D. Asian or Pacific Islander
- E. Hispanic
- F. Other

47. The highest level of education I have completed is:

- A. GED or High School Diploma
- B. Some college-level coursework
- C. Associate's Degree
- D. Bachelor's Degree
- E. Master's Degree
- F. Post-Master's Degree

48. My total annual (yearly) household income is:

- |                      |                       |
|----------------------|-----------------------|
| A. \$10,000 or less  | G. \$61,000-\$70,000  |
| B. \$11,000-\$20,000 | H. \$71,000-\$80,000  |
| C. \$21,000-\$30,000 | I. \$81,000-\$90,000  |
| D. \$31,000-\$40,000 | J. \$91,000-\$100,000 |
| E. \$41,000-\$50,000 | K. \$100,000+         |
| F. \$51,000-\$60,000 |                       |

49. My birth date is \_\_\_\_\_  
month                      day                      year

50. The location of the community college where I am completing this survey is:

- A. Asheville-Buncombe Technical Community College
- B. Blue Ridge Community College
- C. Haywood Community College
- D. Southwestern Community College
- E. Tri-County Community College

Please return to your instructor or email as a Word attachment to [marna.holland@asheville.k12.nc.us](mailto:marna.holland@asheville.k12.nc.us) by March 3.

Thank you for your participation in this research. A summary of the research will be sent to the community college early childhood departmental chair upon the completion of the study. If you are interested in the results of this study, please consult that person at your local community college. Again, your participation is appreciated.