2016

A Comparative Analysis of Meals Offered at Child Care Centers by Participation in a Child and Adult Care Food Program

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2016

Abstract

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by

Melissa Lynn Williams

MA, University of Phoenix, 2009

BS, University of Mount Olive, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Early Childhood Education

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Abstract

Nearly 70% of preschool children in the United States are enrolled in child care facilities. This means that they eat many meals away from their homes. Despite government support for childhood nutrition through the Child and Adult Care Food Program (CACFP), research that measures the nutritional value of meals served in child care facilities has been lacking. The purpose of this quantitative study was to determine if there are differences in the calories and nutritional value of lunch meals offered to preschool children in facilities that participate in CACFP and in facilities that do not participate in CACFP. Ajzen's theory of planned behavior formed the theoretical foundation for this study. Two research questions addressed the nutrient and caloric content of lunches served in CACFP and non-CACFP facilities. An ex post facto quasi experimental design was used to compare 598 meals from existing monthly menus from a random sample of 30 child care facilities located in a state in the Southwestern United States. Using a MANOVA test, significantly greater amounts of proteins, fats, and calories were found in meals served by non-CACFP facilities. A comparison of actual menu items suggested that greater numbers of fatty foods were present in menus served at non-CACFP facilities. These results support literature that found childhood illnesses, like obesity and malnutrition, may stem from high-calorie meals that lack adequate nutrients. This study may contribute to positive social change by supporting nutrition oversight, such as that provided by the CACFP program; encouraging tighter state and local nutritional guidelines in child care; and focusing attention on the importance of everyday nutrition for all children attending child care facilities.

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Dedication

I would like to dedicate this paper to my family, my small circle of true friends, and my colleagues who encouraged me to realize just how much I am needed in the early childhood field and how important it is for me to make a social change, especially in the area of childhood nutrition.

Acknowledgments

I would like to acknowledge my committee, Dr. Flohr, Dr. Lacy, and especially Dr. Patricia Anderson, my chair, who by the grace of God has stuck with me from beginning-to-end with her countless e-mails, constructive criticisms, and many modalities of teaching until I received what I needed.

I would also like to thank Neil Blumberg for always making me laugh.

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Chapter 1: Introduction

Introduction

Enrollment in child care in the United States is at an all-time high, but the nutrition that children need for adequate development is unreliably delivered even in Head Start (a program of the U.S. Department of Health and Human Services that provides comprehensive early childhood education, health, nutrition, and parent involvement services to low-income children and their families) and other programs that focus on nutrition (Neelon, Vaughn, Ball, McWilliams, & Ward, 2012). If children are not offered nutritious foods while they are attending child care, such as fruits or vegetables, they may be denied the nutrients they require to develop optimally (Schwartz, Scholtens, Lalanne, Weenen, & Nicklaus, 2011). Neelon et al. (2012) noted that child care providers have limited training in the area of nutrition, and so children enrolled in out of home care, such as child care centers and child care homes, may not receive the nutrients that are required for optimal development.

Some but not all child care facilities are part of the Child and Adult Food Program (CACFP), a federally funded program that supports the service of healthy meals to children in a child care facility (CACFP, 2016). The CACFP is a voluntary enrollment program (CACFP, 2016). Some child care facilities may not want to be bothered with the rules and regulations that must be strictly adhered to while on the program. This program provides monthly monetary compensation to child care facility directors, as well as information about nutrients needed for a child to develop adequately (CACFP, 2016). Because of the oversight and guidance of the CACFP, it may be that meals prepared with

the assistance of the CACFP program are nutritionally distinct from meals prepared in locations that are not part of the CACFP. Through a comparison of meals served in CACFP and non-CACFP locations, with this study I intended to determine what nutritional differences exist in meals served at child care facilities that might affect children's nutrition.

In this chapter, I will describe the background of my study, lay out the problem statement, explain the purpose of the study, and introduce the research questions and hypotheses. I will also situate this study in relation to Ajzen's (1991) theory planned behavior. I will clarify the nature of the study including definitions, assumptions, scope, delimitations, and limitations. I will further justify the significance of this study and conclude the chapter with a summary.

Problem Statement

The problem is that child care outside of the home has been on the rise, which affects children's nutrient intake while they are present at child care facilities for most of their daily meals and results in poor nutrition (Neelon et al., 2012). Child care providers are responsible, in part, to serve healthy meals; however, there is little training and guidance provided (Neelon et al., 2012). In their study, Neelon et al. (2012) stated that young children were served less fruit and less vegetables in child care than they were required to consume to meet the recommended standard on the MyPyramid scale (United States Department of Agriculture (USDA), 2016). The amounts of fiber and dairy were also inadequate (Neelon et al., 2012). This is a concern considering that malnutrition and obesity have become two prominent problems in the United States with children (CITE).

One in three children are overweight or obese today (Child for Disease Control and Prevention (2015), and 11% of children are malnourished (WHO, 2015).

Good nutrition is the cornerstone of survival for health and development, not only for current but also for future generations (Sultan, 2014), so the evidence that children in child care may not receive the proper nutrients for their developing bodies is concerning. Sultan (2014) stated that nutritious foods for pregnant mothers and their babies should be easily accessible and there should be better nutrition education for child care providers to increase levels of nutrition and good health in small children. Glanz (2009) concurred, suggesting that public services like child care offer the potential for the greatest gains in childhood nutrition, simply because these organizations are central to many families' everyday lives. The U.S. Department of Agriculture (USDA) is responsible for monitoring both the food supply itself and for supporting food use in public service contexts (USDA, 2015). One example of this support is the USDA's National School Lunch Program; another is the CACFP (Glanz, 2009).

Purpose of the Study

Children who attend child care, spend more than 27 hours a week in a child care facility (U.S. Department of Health and Human Services, 2016), which indicates that more than half of their meals are consumed away from the home (Nataleet al., 2013). The purpose of this quantitative study was to determine if there are parallel differences in the calories and nutritional value of lunch meals offered to preschool children in facilities that participate in CACFP and in facilities that do not participate in CACFP. Through this study, I sought to determine whether or not they are receiving the adequate nutrients

needed to develop and grow optimally while attending child care. In this quantitative study, I compared lunches using menus provided from child care facilities that participated in the CACFP and those facilities that chose not to do so.

There are state-funded and federally-funded programs available to support child care facilities to ensure that the children in their care are consuming the proper nutrients that they need for optimal growth and development (About the CACFP, 2015). The most popular program, the CACFP, receives funding from the federal government to ensure that children attending these programs receive nutritious meals (CACFP, 2015). All child care homes and centers are eligible to receive these funds, regardless of tuition or socio-economic status (CACFP, 2015). Each day, children enrolled in CACFP-participating child care programs can receive two nutritious meals and one snack, which meet the USDA guidelines. With over one in five children in the United States living in a food insecure household, the CACFP plays a vital role in improving the quality of care and the attainment of nutritious meals for children in communities across the country (Child Care in America, 2011).

Research Questions and Hypotheses

Two research questions (RQs) guided this study:

RQ1: To what extent is there a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented?

H_01: There is not a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

H_11: There is a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

RQ2: To what extent is there a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented?

H_02: There is not a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

H_12: There is a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

Theoretical Foundation of the Study

In this study, I examined the outcome of meal planning decisions made by child care personnel who do or who do not participate in the CACFP program. The efficacy of these decisions may be influenced by factors common to planning processes. Therefore, the theoretical foundation of this study addressed the ways decisions are made.

The theory of planned behavior of Ajzen (1991) proposed two justifications to explain human behavior. They include having a need to do better and acquiring the

means to actually do it. To say this in other words would be to say that the more self-assured a person feels that they can acquire appropriate means to do something different, the more likely is it that they will really do it.

This theory states that a behavior that is planned should coincide with the behavior that is actually carried out (Ajzen, 1991). There are three abstract and autonomous determinants of planned behavior theory (Ajzen, 1991). The first one is the attitude toward the behavior; this attitude is either positive or negative (Ajzen, 1991). The next determinant of planned behavior theory means that outside influences may have a tendency to sway the individual to do or not to do something (Ajzen, 1991). The last point is the level of perceiving of the individual's thinking (Ajzen, 1991). This means the person must recall whether or not, in their memory, how easy or hard the decision was (Ajzen, 1991).

This theory of planned behavior is said to embrace an individual's motivation through influencing their behavior (Ajzen, 1991). The individual then conclude, in their mind, how much they are willing to try and how hard they are willing to work for what they want (Ajzen, 1991). The theory of planned behavior provides the theoretical foundation of this study because, even though child care providers may have good intentions of feeding the children in their care nutritiously and they may have the first theoretical determinant of positive attitude, they may not be motivated to do so if they lack the other two theoretical determinants, positive social pressure and perceived behavior control. These two determinants may be supported by participation in a state-funded or federally-funded program such as the CACFP.

Nature of the Study

The participants for this study included 15 directors or owners of randomly chosen child care facilities that participate in the CACFP program in a southeastern state of the United States and another 15 directors or owners of randomly selected child care facilities in the same state that do not participate in the program. These child care facilities were identified, with support from the state's department of health and human services website, which lists all of the child care facilities in the state. The child care facilities eligible for inclusion in this study included both centers and family child care homes since the regulations are the same for both with regard to portion sizes and nutritional requirements for children's meals.

I gathered the data through an e-mailed request to each director or owner to share menus for the previous months' meals (See the Appendix for the e-mail). Licensed centers in the selected state are required to create such menus, which they then distribute to parents and to their licensing agency upon request. Because these menus are required, they were readily available for use in this study and should have reflected the actual meals served. A month's menus should include at least 20 lunches from each facility, including the food that was served and the approximate portion size for each food served. This process yielded about 600 lunches from the CACFP and from the non-CACFP groups. Using Release 27 from the USDA National Nutrient Database for Standard Reference (2015), I determined the caloric value and nutrient value (including calories, carbohydrates, fats, and proteins) for each lunch. These data were entered into a spreadsheet for comparative analysis of calories, carbohydrates, fats, and proteins using a

one-way ANOVA. The independent variable was participation or non-participation in CACFP. The dependent variables were levels of calories, carbohydrates, fats, and proteins in lunches described in monthly menus.

This study followed an ex post facto design, since assignment to the condition that comprises the independent variable was not part of this study. The choice to participate or not participate in CACFP occurred prior to the study's start. This contrasts with an experimental design, in which participants are randomly assigned to experimental treatments rather than identified in naturally occurring groups (Creswell, 2013). An ex post facto design best fits the situation under consideration.

Definitions

Carbohydrates: A class of compound that are made in plants through photosynthesis and are used in human bodies as energy. Approximately 130 grams of carbohydrates are needed to consume for growing children everyday (Harvard, 2015).

Child care center: A facility or center, which is used for a larger program located in a commercial building ([Redacted] Department of Health and Human Services Division of Child Development and Early Education, 2011).

Family Child Care Home: A "home" is a smaller program usually located in a family residence ([Redacted] Department of Health and Human Services Division of Child Development and Early Education, 2011).

Fats: Any natural oils occurring in animal bodies that can be consumed. Up to 78 grams of healthy fats are recommended for children (Harvard, 2015).

Proteins: Nutrients found in foods like lean meats, beans, and dairy products that contain amino acids, which play a role in consumption. Proteins are critical for adequate cell formation and function (Harvard, 2015).

Assumptions, Scope, Delimitations, and Limitations

I assumed that because menus are required by the state child care licensing authority that the menus provided by owners and directors reflected what was actually served to children on the days indicated. I also assumed that non-CACFP facilities developed menus independently of CACFP directives. I assumed that the month in which menus were gathered was typical of all other months of operation by the child care center or home.

The scope of this study was a comparison of lunch menus provided by a random sample of childcare centers that participated in the CACFP program and those provided in a random sample of child care settings where there was no participation of the CACFP program. This study was delimited to include a comparison of lunch menus for 1 month from no more than 30 child care facilities in one state of the United States. A limitation of this study was that menus from a limited number of facilities operating in only one state comprised the data. Only 30 child care facilities provided these data, although the state that this study was set it is home to over 5,000 child care facilities (Child Care Center U.S., 2015).

Significance of Study

In this study, I compared the calories and nutritional value of lunch meals offered in CACFP and non-CACFP child care programs. After the study, I will measure the

results. The results of this study may provide insight into the efficacy of the CACFP program and into the ability of non-CACFP facilities to provide equal or better nutritional quality to that provided by CACFP facilities as a positive social change.

Summary

I conducted a comparative analysis involving lunch menus from randomly chosen child care facilities, half of which were enrolled in the CACFP and half of which were not enrolled in the CACFP, in one state in the southeastern United States. The information obtained from the study resulted in the comparison of calories, carbohydrates, fats, and proteins, in the hopes of better understanding the nutritional value of foods served to children and the effectiveness of supports like the CACFP in guiding menu planning. In Chapter 1, I provided the introduction and background of the study, in Chapter 2, I will offer a review of research explaining the importance of early nutrition; childhood nutrition in the U.S.; and factors impacting child nutrition, nutrition in child care facilities, existing training available to staff, and the requirements of the CACFP. In the chapter, I will also focus on Ajzen's (1991) theory of planned behavior. In Chapter 3, I will discuss the quantitative research method, data analysis research design and rationale, operational definitions, summary of data, and presentation of the findings.

Chapter 2: Literature Review

Introduction

The purpose of this study was to compare the calories and nutritional value of lunch meals offered in CACFP and non-CACFP child care programs. To accomplish this task, I will present research about the importance of nutrition in the early years, childhood nutrition in the U.S., nutrition in child care facilities, and introduce the CACFP. I will also include the literature search strategies, the theoretical foundation, and finally, conclude the chapter with a summary.

If children's nutritional needs are not met adequately in early childhood, development could be altered negatively with damaging effects later in life (Tickell, 2011). Nutritional beginnings in the first years of life should have the most structurally sound regimen as evidence has proven negative outcomes for children with poorer beginnings (Tickell, 2011). Evidence shows that good quality care, including adequate nutrition, has a large impact on children's long term outcomes (Tickell, 2011).

Literature Search Strategy

Databases used for this research via the Walden University Library were Sage Premier, ERIC, EBSCO Host, Google Scholar, Education Research Complete, ProQuest Central, and Dissertation and Theses at Walden. The systematic review included peer-reviewed journal articles published within the past 5 to 7 years. Government websites were suitable for examining information and statistics of the CACFP. Search terms included, but were not limited to: *nutrition, nutritional meals in child care, provider training on nutrition, CACFP, importance of nutrition in the early years of life,*

developed and undeveloped countries nutrition access, malnutrition, obesity, USDA, department of health and human services, division of child development, and *recommendations and guidelines for preschool nutrition.*

Theoretical Foundation

The theory of planned behavior of Dr. Ajzen (1991) provided the theoretical foundation for this study. This theory is composed of two rationales to explain human behavior: possessing the need to do better and obtaining the means to actually make it happen (Ajzen, 1991). Simply stated, the more confident individuals feel that they can obtain suitable means to make a change that they want to make, the more likely is it that they will actually make the change.

The theory of planned behavior infers that purposes and insights of behavioral conduct should be a part of the expectation of the behavior (Ajzen, 1991). There are three abstract and autonomous determinants of planned behavior theory (Ajzen, 1991). The first one is the attitude toward the conduct; this attitude is either positive or negative. This theory is said to encompass an individual's motivation through behavior influencing (Ajzen, 1991). The individual must then conclude, in their mind, how much they are willing to try and how hard they are willing to work for what they want (Ajzen, 1991). The theory identifies motivational elements that affect behavior and suggests the scale of difficulty perceived by the persons who are trying, how hard they will try, and how much of a struggle they are willing to put forth to achieve an outcome (Ajzen, 1991). The theory of planned behavior provides the theoretical foundation of this study because, even though child care providers may have goals of nourishing the children in their care,

and therefore, possess the first theoretical determinant of positive attitude, they may not be inspired to do so if they lack the other two theoretical determinants, positive social pressure and perceived behavior control (Ajzen, 1991). These two determinants may be supported by participation in the CACFP program.

The general public has been judged concerning their personal associations and organizations to include their living arrangements, their political affiliation, their occupations, and their friends (Ajzen, 1991). One recommended solution for the poor prescient legitimacy of states of mind and attributes are the aggregation of particular practices crosswise over events, circumstances, and types of activity (Ajzen, 1991). The thought behind the standard of aggregation is the suspicion that any single example of conduct reflects not just the impact of an applicable general demeanor, additionally the impact of different elements one of a kind to the specific event, circumstance, and activity being watched (Ajzen, 1991). By gathering diverse practices, witnessed on various events and in various circumstances, these different sources of impact tend to delete one another, with the outcome that the total speaks to a more substantial measure of the basic behavioral manner than any single conduct (Ajzen, 1991). A person's attitude and personality, in general, predict specific behaviors.

Nonetheless, the guideline of aggregation does not clarify behavioral variability crosswise over circumstances, nor does it license expectation of a particular conduct in a given circumstance (Ajzen, 1991). It was intended to exhibit that general states of mind and identity qualities are embroiled in human conduct, yet that their impact can be distinguished just by taking a look at wide, collected, viable cases of conduct (Ajzen,

1991). This is relative to my study because when given rules, providers will be encouraged to make the right choices when it comes to preparing and serving the children in their care, the proper nutrients to allow them to grow optimally.

For an accurate expectation, many conditions have to be met, such as intention and perceived behavioral control as it relates to the predicted behavior (Ajzen, 1991). This is relevant to my study because providers may want to be compensated monetarily, which will encourage them to make certain that the children in their care are receiving the proper nutrients when they eat.

When the behavior gives a person total control over behavioral performance, motivation should be enough (Ajzen, 1991). When behavior and perceived behavior are both present, one will always dominate the other (Ajzen, 1991). It is behavior that dominates as it is not always possible to predict what an individual will do (Ajzen, 1991). Providers who care for children, both in family child care homes and child care centers, want to feed the children they care for in a way to allow them to develop optimally; however, just because they want to do the right thing (perceived behavior), does not give them the ability to do so (behavior). Research on childhood nutrition and the role of child care providers in supporting child nutrition is presented in the remainder of this review.

The Importance of Early Nutrition

The nutrition and health status of youth in America has been receiving growing consideration. In the United States, children beginning at age 2, have low intakes of fiber, Vitamin D, calcium, and potassium, yet an over-abundance of sugars, refined starches, and calories (Hess and Slavin, 2014). Too little Vitamin D, calcium, and potassium can

prompt an extensive variety of wellbeing issues further down the road, including osteoporosis, hyperparathyroidism, and hypertension (Hess & Slavin, 2014). Excess calories and refined carbohydrates can cause heart attacks or cause a person to have weight issues (Hess & Slavin, 2014). An earlier National Health and Nutrition Examination Survey showed that low iron levels were a serious problem for the required amount of this nutrient that children require, which resulted in the government requiring fortification of grains and cereals with added iron to correct this deficiency (Hess & Slavin, 2014). Some measurable results demonstrate that very nearly 35% of all casualties in youngsters happen with children less than 5 years old years old, an expected 178 million children all over the world are physically hindered by poor nutrition, and altogether 19 million children have extreme intense lack of healthy nutrition (Imdad & Bhutta, 2012). Early nutrition provides the foundation for children's physical development, brain development, and learning (Ogata & Hayes, 2014). I will address the importance of early nutrition on those three systems: physical development, brain development, and cognitive systems necessary for learning in this chapter.

Nutrition and Physical Development

Physical growth is characterized as an individual progression of development, physical wellness, fine motor skills, gross motor skills, and ability to handle one-self (Alves da Cunha, Leite, & Saraiva de Almeida, 2015). For children to grow optimally, they need nutrients most associated with growth and survival, which are vitamin A, iron, zinc, and iodine (Alves da Cunha, Leite, & Saraiva de Almeida, 2015). Severe deficiency of all four of these nutrients is associated with decreased survival, and even

marginal vitamin A deficiency increases mortality from common childhood infections (Bhutta, Hurrell, & Rosenberg, 2014).

Micronutrients are dietary elements, frequently alluded to as vitamins and minerals, which, despite being essential by the body in little sums, are essential to growth, malady aversion, health, and welfare (Center for Disease Control, 2015). Micronutrients are not created in the body and should be received from the normal eating routine (CDC, 2015). This is in contrast to macronutrients which are required in amounts sufficient to meet a minimum of 1,000 calories per day for children 2 years of age (USDA, 2015), including carbohydrates, fats, and proteins.

Inadequacies in micronutrients, for example, in iron, iodine, vitamin A, folate, and zinc, can have debilitating outcomes (Imdad & Bhutta, 2012). At any rate half of youngsters overall, ages 6 months to 5 years old, experience the ill effects of one or more micronutrient failure (CDC, 2015). These deficiencies cause diseases in children such as stunting and wasting (CDC, 2015). When a child doesn't get enough vitamin A or zinc, they could die or become disabled (CDC, 2015). The facts are that about a million children do die and about 10% become disabled (Imdad & Bhutta, 2012).

Vitamin A plays a critical part in the visual system and is also an anti-infectious agent (Imdad & Bhutta, 2012). Inadequacies of vitamin A are the main source of visual impairment; this does not have to occur if the proper precautions are taken with youngsters, as proper amounts of vitamin A help protect from the dangers of illness, casualty from extreme diseases, and pallor (Imdad & Bhutta, 2012; World Health Organization, 2015). According to a report from the WHO (2015), in a portion of all

nations including the United States, one in three preschool-aged children are lacking in vitamin A. An expected 25 million to 50 million children, whom are lacking vitamin A, become visually impaired each year and half of them pass away inside 12 months of going blind (WHO, 2015). According to the U.S. Department of Health and Human Services (2015), eating foods with vitamin A also prevents muscular degeneration in children.

The amount of vitamin A needed daily for growing children is dependent on the age and size of the child and ranges from 2,000 international units at birth to 3,000 international units at 4 to 8 years of age (Department of Health and Human Services, 2015). Also, the WHO (2015) stated that with two annual doses of vitamin A supplementation in vulnerable populations might eradicate childhood night blindness, pneumonia, measles, infections, and croup. Foods that contain the most vitamin A are sweet potato, beef liver, spinach, carrots, pumpkin, and cantaloupe (USDA, 2015).

Iodine plays a critical part of brain and cognitive development (CDC, 2015). There are billions of people in the world with an iodine shortage (CDC, 2015). Iodine deficiencies can cause thyroid enlargement (goiter) and severe, irreversible brain damage, termed endemic cretinism (Eastman & Jooste, 2012). The main sources of iodine in the diet vary from one country and region to another (Eastman & Jooste, 2012). In less developed regions of the world lacking iodine in the soil or water, the most valuable source is likely to be iodized salt (Eastman & Jooste, 2012). By contrast, in developed countries where most varieties of food are readily available, milk and dairy products, seafood, and the unrestricted use of iodized cooking and table salt are the major sources

of iodine in the diet (Eastman & Jooste, 2012). The WHO (2015) has stated that those people who have the iodine shortages now can get iodized salt. Over the past decade, the number of countries employing universal salt iodization has doubled from around 50 to over 100, but there are over a dozen developing countries where there has been little or no progress (Eastman & Jooste, 2012).

American children consume an excess amount of salt, primarily through use of condiments (WHO, 2015). The amount of iodine needed daily for growing children is as follows: from birth to 6 months = 110 micrograms, infants 7 through 12 months = 130 micrograms, 1 through 8 years of age = 90 micrograms (DHHS, 2015). Foods that contain the most iodine are seaweed, cod, yogurt, and milk (USDA, 2015).

Cognitive development and motor development in children require iron in the diet (CDC, 2015). It also helps with tissue connectivity. An insufficient amount of iron in the first year of life may cause delay in the development of the central nervous system (Beard, 2008). Beard's (2008) research in newborns state that with improved myelination of oils, variations in monoamine digestion system in striatum, and better functioning of the hippocampus occur. The body stores iron in the muscles, liver, spleen, and bone marrow. In any case, when levels of iron kept in the body turns out to be low, anemia appears. Red platelets get to be littler and contain less hemoglobin (DHHS, 2015). Accordingly, blood transports only a little bit of oxygen from the lungs all through the body. Indications of iron insufficiency and frailty incorporate tiredness and absence of vitality, gastrointestinal agitated, poor memory and focus, and less capacity to battle off

germs and contaminations to govern body climate (DHHS, 2015). Babies and children with iron insufficiency anemia may cultivate learning challenges (DHHS, 2015).

The amount of iron needed daily for growing children is as follows: birth to 6 months, 0.27 milligrams, infants, 7 through 12 months, 11 milligrams, children 1 through 3 years, 7 milligrams, and children 4 through 8 years, 10 milligrams (DHHS, 2015). Iron-rich foods should be included in a child's diet almost daily if supplementation is not being consumed. Foods that contain the most iron are breakfast cereals, oysters, white beans, dark chocolate, beef liver, lentils, and spinach (USDA, 2015).

Vitamin D plays a critical part in the development and maintenance of strong bones (DHHS, 2015). It does as such by offering the body some assistance with absorbing calcium (one of bone's primary components) from sustenance and supplements. Individuals who get too little vitamin D might grow delicate, slender, and have fragile bones, a condition known as rickets in youngsters and osteomalacia in grown-ups (DHHS, 2015).

The amount of vitamin D needed daily for growing children is as follows: birth to 12 months, 400 international units and children 1 through 13 years, 600 international units (DHHS, 2015). Vitamin D can be found in fish, fortified juice, and fortified dairy (USDA, 2015). They should be included in a child's diet, almost daily if supplementation is not being consumed.

Zinc is the fourth most plentiful element in the mind, where it adds to cerebral structure and capacity through its part in DNA and RNA amalgamation (Prado & Dewey, 2014). Zinc additionally advances invulnerability, imperviousness to disease, and

legitimate development and improvement of the sensory system (DHHS, 2015). No less than 17.3% of the worldwide populace is in danger for zinc insufficiency because of dietary deficiency, however up to 30% of individuals are at danger in a few districts of the world (DHHS, 2015). Zinc supplementation lessens the event of early childbirth, diminishes adolescent diarrhea and breathing abnormalities, brings down all-cause casualties, and excessive growth and increase in weight among babies and young children (DHHS, 2015).

The amount of zinc needed daily for growing children. These range from 2 milligrams for infants to 5 milligrams for children ages 4 through 8 years (DHHS, 2015). Foods that contain the most zinc are seafood, beef, fortified breakfast cereal, and pork (USDA, 2015).

Protein makes up approximately half of the volume of bone and around 33% its mass (Heaney & Layman, 2008). There are numerous components that impact bone mass, yet protein has been recognized as being both unfavorable and valuable to bone wellbeing, contingent upon an assortment of variables, including the amount of protein in the eating regimen, the protein source, calcium absorption, weight reduction, and the eroding/base equalization of the eating routine (Heaney & Layman, 2008). Youngsters, particularly young children, have a requirement for extraordinary protein for development and growth. According to Driscoll (2013), who conducted a longitudinal study in Guatemala's northeast Highlands, children who were given a protein-rich porridge at infancy had a greater developmental advantage instead of a negative outcome than children given a candied enhanced drink with no dietary worth. About 30 years after,

those children that received the protein-rich porridge as babies were healthier overall as adults. Protein intake below the daily allowance can be harmful for bone mass and its preservation throughout life; also, an inadequate supply of protein for growing children can severely impair bone development and cause fragility (Bonjour, Amman, Chevalley, & Rizzoli, 2001). In children who are nourished properly, the protein consumption impacts skeletal development and in this manner balances the impact of hereditary elements on top bone mass attainment. A day by day supply of dietary protein is required for bone support. Dietary proteins are essential to skeletal growth. Bone wellbeing is not just a skeletal concern; it is likewise a musculoskeletal concern. Bone strength and bone density must be preserved. Those two components become very reliant on proper muscle mass and muscle function during the aging process, which sequentially become very reliant on adequate intake of the best possible proteins. Strong recommendations of dietary proteins, calcium, and Vitamin D are said to be essential for bone health and the prevention of osteoporosis throughout the life span (Heaney & Layman, 2008). Other contrivances blamable for bone loss and loss of muscle mass are, but not limited to, decreased hormone production, nutrient deficiencies, and physical activity decrease. Skeletal development of children has been best implemented in the elementary school as a physical education class that is a requirement.

Bone development in children is sometimes overlooked as just another part of growing up without any specific recommendations to follow. Bone health determines how strong a child's skeleton will be. Protein makes up approximately half of the volume of bone and about one-third its mass and a day by day supply of dietary protein is

required for bone support (Heaney & Layman, 2008). Heaney & Layman (2008) recommended that animal protein based dietary plans may have a more noteworthy adverse impact on skeletal wellbeing than do vegetable based eating methodologies as dietary animal protein incites a more prominent accumulation in urinary calcium discharge than vegetable protein. In a study in China, urinary discharge of calcium was corresponded assuredly with admission of animal protein (Heaney & Layman, 2008). A Western eating routine has been said to be connected with osteoporosis and urinary calcium depletion (Heaney & Layman, 2008).

Nutrition and Brain Development

Roughly 22 days after origination, the neural plate starts to overlay internally framing the neural tube, which inevitably turns into the brain and spinal cord (Prado & Dewey, 2014). As neural plates and neural tubes become more structured, adequate nourishment is essential, for example, the nutrients include as requirements: copper, folic corrosive, and Vitamin A, which are only the basics, from the very beginning. About two months after birth cell division starts making neuron and glial cells in the neural tube (Prado & Dewey, 2014). After a neuron has its foundational structure, it moves to the brain, and develops axons and dendrites. These cells then associate with other cells, and so forth (Prado & Dewey, 2014). With poor nutrition, some of the neurodevelopmental processes will negatively affect dendritic branching and synaptic density (Prado & Dewey, 2014). There are six key neurodevelopmental processes: neuron proliferation, where new cells through cell division, axon and dendrite development, neurotransmitter arrangement, pruning, and capacity, myelination, when white, greasy matter that covers

axons and quickens the pace of nerve driving forces setting out starting with one cell then onto the next, and apoptosis, modified cell passing (Prado & Dewey, 2014). In the event that a child is sustained well from origination through earliest stages, all five of the key neurological processes will develop adequately. If the child's diet does not meet the nutritional requirements, their developmental potential in cognitive, motor, and socioemotional abilities is at risk (Prado & Dewey, 2014).

Brain growth happens quickly throughout the first 12 months of life (Robinson & Fall, 2012). Optimal nutrition is especially important to early brain development (Dauncey, 2014). The two key micronutrients for brain development are vitamin B12 and folate (Dauncey, 2014).

Vitamin B12 is a source of nourishment that keeps the body's nerve and platelets sound and makes DNA, the hereditary material in all cells (Dauncey, 2014). Vitamin B12 likewise keeps a sort of weakness called megaloblastic frailty (anemia) that makes individuals drained and feeble (DHHS, 2015). Vitamin B12 is needed daily for growing children is as follows: birth to 6 months, 0.4 micrograms, infants, over 6 months through one-year-old, 0.5 micrograms, children 1 through 3 years, 0.9 micrograms, and children 4 through 8 years, 1.2 micrograms (DHHS, 2015). Foods and their portions that contain the most B12 are clams, liver, beef, fortified breakfast cereals, trout, and salmon (USDA, 2015).

Folate or folic acid helps the body make healthy new cells (USDA, 2015). Folate is needed by pregnant women and children as it prevents defects and creates DNA.

Folate is also needed for the body's cells to divide and needed as follows: birth to 6 months, 65 micrograms, infants, 7 trough 12 months, 80 micrograms, and children 1 through 3 years, 150 micrograms, and children 4 through 8 years, 200 micrograms (DHHS, 2015) that contain the most folate are beef liver, spinach, beans, fortified breakfast cereals, fortified rice and pasta, and asparagus (USDA, 2015).

Together, pre-birth and postnatal sustenance influence wellbeing and disease in later life, and these impacts can pass through the hereditary line. If a child receives all of the recommended nutrients in infancy, these nutrients will adequately support neurocognitive advancement by giving a long chain of polyunsaturated unsaturated fats, which are found in high levels in the brain, and gather during the time of development (Robinson & Fall, 2012). Dauncey (2014) adds that a more adequate nutrition regime during the first 36 months of life will have a positive effect on verbal and nonverbal cognitive ability at 10 years of age.

Children grow at various rates, however they all grow through an identifiable grouping and more than 80% of brain development happens right on time and it impacts each part of a child's upcoming life (Sultan, 2014). Formation of the brain begins immediately upon birth and develops through biological, psychosocial, and genetic behavior (Walker, et al., 2011). Although all supplements are imperative for mental health, certain supplements including proteins, long chain polyunsaturated unsaturated fats, iron, copper, zinc, iodine, folate, choline, and vitamins A, B6 and B12, have especially huge impacts ahead of schedule in life and effect basic or acute periods for neurodevelopment (Wachs, Georgieff, Cusick, & McEwen, 2014). Specific time periods

that must be met with the correct nutrients are crucial and if they do not successfully meet the time constraint, the brain formation of the young child can ultimately be damaged for the child's entire life with permanent adverse outcomes (Wachs et al., 2014).

Cognition incorporates the mental procedures included in securing information and the combination of these procedures into various reactions, for example, learning, choice making, focus and recollection (Dauncey, 2014). Earlier exhaustive surveys have demonstrated that nourishment influences brain structure and capacity all through life. Complete comprehension of the correlations with the adequate nutrients, sustenance, and cognition is constrained, to some extent by many levels nature of the healthful and neurological sciences, and their related strategies (Dauncey, 2014). Yet, it is respectfully documented that in numerous wellness plans, nourishments and supplements are included, and their influences can be advantageous or non-advantageous. Numerous brain operations that support intellectual capacity are influenced by nourishment, including neurogenesis, synaptic versatility and neuronal availability (Dauncey, 2014). The connection among nourishment and cognizance is exceedingly multifaceted and depends on age, sex and hereditary intercommunications as well as on different dietary associations, general supplement status, past dietary history and interactions with many other ecological components (Dauncey, 2014).

There is evidence, however, that if interventions take place, a more positive outcome for the child's health, later in life, take place. Imbalances within populations have origins of negative early encounters. Formative neuroscience demonstrates how early organic and psychosocial encounters influence mental health (Walker et al., 2011).

The authors recognized that insufficient intellectual incitement, hindering iodine inadequacy, and iron insufficiency frailty (anemia) are key dangers that keep a large number of young children from achieving their formative potential (Walker et al., 2011).

Nutrition and Learning

In spite of the fact that many components might combatively impact useful outcomes, those particularly connected to the subjective improvement and instructive achievement of school learners incorporate the want for food, poor nourishment, and the wellbeing of preschool children (Nkhoma, Duffy, Cory-Slechta, Davidson, McSorley, Strain, & O'Brien, 2013, p.3). If children do not receive adequate nutrition in their early years, they will have difficulty with cognition as they grow (Tickell, 2011). Robinson and Fall (2012) found that children who had a larger consumption of fresh produce and a homemade nutritious diet before the preschool years, resulted in higher scores on tests of full-scale verbal and insights in preschool. Glewwe et al. (2011) found that an optimistic connection among diet and success exists.

On the positive side, healthy fed children have an advantage and it emerges from the way that they enter school as they seem to have more of an optimistic attitude to learn. Whatever is left of this attitude branches from more prominent learning, more effectively through every year of education. Glewwe et al. (2011) found proof that dietary position impacts knowledge determination in regards to being present or completing assignments but stated that the results of their study had more positive impact with nutrition and achievement (Northstone, Joinson, Emmett, Ness, & Paus 2011).

Currently, there has been negative research on temporary impacts, as it pertains to dietary consumption on the brain's capacity to learn in children (Northstone et al, 2011). Nutritional arrangements with 36 month old children have been associated with an IQ at around 8 years of age and associations that persist even after modifications to the child's diet at later ages in life (Northstone et al, 2011). Lower nutrient intake correlated with lower IQ test scores while higher nutrient intake was associated with higher IQ test scores. These associations were stronger for verbal than for performance IQ, indicating an increased effect on social skills and school performance (Northstone et al., 2011).

Childhood Nutrition in the U.S.

The consumption of food in the U.S has become 80% inadequate with little to no nutrients consumed on a daily basis that meets the USDA guidelines for health (USDA, 2015). This issue is connected by the fact that U.S. consumers, including children, increasingly eat meals from away from home (Ford, Slining, & Popkin, 2012). These shortfalls have been reported in general that an eating routine's quality in the total population, and in addition, for particular supplements for children of all ages are not being met. Children older than two years old are incorporated into the Healthy Eating Index (HEI), an instrument intended to gauge consistency with the eating regimen related to proposals of the Dietary Guidelines for Americans (DGA, 2014; (Orgata & Hayes, 2014). In this section, I will present evidence of food insufficiency, malnutrition, and poor eating habits among preschool children and also address childhood obesity as a nutrition indicator.

Evidence of Food Insufficiency among Preschool Children

Food insufficiency among preschoolers is a problem for industrialized as much as developing countries. This shortage of nutrients, whether it is caused by availability (too much or too little) or family socioeconomic status impacts children's development (Ford, Slining, & Popkin, 2013). Ford et al. (2013) found that over two decades there were massive increases in sugar, fat, and salt in the U.S. children's intakes from toddlers to kindergarteners. Prepared foods are at an all-time high, too (p. 3). According to Ford et al., their results were consistent with other preschool studies about food insufficiency. The Feeding Infants and Toddlers Study (FITS) showed that young children were consuming an abundance of saturated fats, salt, and calories in their daily diets (Briefel, Kalb, Condon, Deming, Clusen, Fox & Reidy, 2010).

Okechukwu, El Ayadi, Tamers, Sabbath, & Berkman (2012) found associations between financial strain and food insufficiency in working class American families. Nearly half of the respondents in this study reported running out of food during a given pay period (Okechukwu, El Ayadi, Tamers, Sabbath, & Berkman, 2012). Okechukwu et al., found much higher prevalence of financial strain and food insufficiency among the person in the home that makes the most money than among the person in the home that does not make the most money or parents who are married living in the same household. Children who do not have enough food usually have multiple years of food uncertainty (Kennedy, Fitch, Warren, & Drew, 2013). Often this leads to bad food choices as much research has shown that food choices and dietary actions are made during early childhood (Ford, Slining, & Popin, 2013). In many family units where children encounter low

sustenance security, no less than one child did not have the appropriate amount of food to consume, went hungry, or missed suppers. Differences in cash flow, step families, and culture determine if a child will be at risk (Ford, Slining, & Popkin, 2013).

Family structure, family eating habits, the foods available at home, the foods available in schools and the foods available in fast-food places have significant influence on healthy eating in children and youth (Taylor, Evers, & McKenna, 2015). If a child is constantly in front of the television-set, of course he will beg his parents for junk food as constant commercials bombard his mind. Taylor et al. (2015) found that children themselves make unhealthy food selections, leading to both dietary overindulgences and insufficiencies. This study resulted in children choosing foods loaded with sugars and fats, not much folate or calcium, and certainly no healthy fresh foods like salads. Food prices and parental education about nutrition were implicated as factors in this study. Roos, Johansson, Kasmel, Klumbiené, & Prättälä, (2001) found similar results in Europe and that the healthy diets were among the educated. Food insecurity continues to be elevated to spite the assistance programs that the government spends billions of dollars on, according to 2012 policies (Gunderson & Ziliak, 2014). According to Gunderson and Ziliak (2014), the danger for child nourishment instability drops rapidly with cash flow, however, even at earnings two and three times the hardship level, sustenance instability is entirely too high. Meanwhile, right around 60 percent of children in family units near the indigence line are in sustenance secure families. This proposes cash flow is just part of the story and that there are other variables, including child care arrangements, which also contribute to children's food security (Gunderson & Ziliak, 2014). Government programs

are available; however, not enough food insufficient families are aware of the options (Gunderson & Ziliak, 2014). This only makes the issue worse as children do not receive adequate nutrients and public policy remains the same.

Evidence of Malnutrition among Preschool Children

A survey suggests that American children do not eat the varieties and quantities of foods that they should with the nutritional recommendations that they need (Ogata & Hayes, 2014). According to Ogata and Hayes (2014), as children eat more sugar, fat, and salt than they need, they continue to fail with the Dietary Guidelines for Americans recommendations as major vitamins and minerals are skipped daily. They include, but are not limited to, calcium, dietary fiber, potassium, vitamin D, and foods like whole grains, vegetables, fruits, and dairy (Ogata & Hayes, 2014). Almost 16 million children are likely living in food insecure households, around the world (Ogata & Hayes, 2014).

The scarcity of good foods affects children's physical and mental states. The affected areas of development include physical development, mental development, behavior problems, social and emotional development, and illness susceptibility (Kandala, Madungu, Emina, Nzita, & Cappuccio, 2011). These problems get worse over time and affect children throughout their entire lives if the foods that they need remain scarce or absent. This can and easily does pass from generation to generation.

One in seven American households are unfortunately involved in food insecurity at times throughout the year as there is not enough cash flow and also, other means leave them without nutritious foods, especially in single-mother households (Franklin et al, 2012). Malnutrition is prevalent here in America. There are homeless children here in the

U.S. The fact of the matter is that there are around 1.3 million homeless children (Campaign for Children, 2014).

Evidence of Poor Eating Habits among Preschool Children

Children increasingly consume food away from home, particularly from fast-food establishments (Powell & Nguyen, 2013). Powell & Nugyen (2013) stated that, in a study of eating patterns from 1978 to 2006, it was found that fast-food establishments and, in part, full service restaurant, in America, jumped from 2 % to 17 % when compared to eating meals at home. The American diet has a greater total energy (calories) intake and poorer nutrient intake than what is needed for optimal nutrition. Sugar, fat, and saturated fat were among the highest consumed impurities due to the fast-food overtake of children's diets over the last few decades. Lower and middle income families consumed higher calories from eating fast-foods than did higher income families. Powell & Nguyen (2013) believed that since fast-food is so cheap, more people eat at these establishments.

In a study that took place from 1965–2008, it was noted that home cooked meals are becoming a thing of the past (Smith, Ng, & Popkin, 2013). American diets have less healthy fresh foods and dairy and more processed-foods (Smith, Ng, & Popkin, 2013; USDA, 2015). In fact, children eat a lot of fast food (Smith, Ng, & Popkin, 2013). That may be due to the fact that the number of mothers who cook declined from 92 % in 1966 to 68 % in 2008 (Smith, Ng, & Popkin, 2013). Not many people still cook at home these days, regardless of their income. Only about 50% of Americans actually cook every day meals at home (Smith et al., 2013). Instead, more people rely upon convenience-foods that require little or no preparation, such as apples or carrots, snack foods like chips or

cookies, and prepared meals from the grocery store (Smith et al, 2013). By the same token, people who cook, do not really cook from scratch, they tend to used boxed meals like rice, hamburger helper, instant oatmeal's, and foods than can just be microwaved (Smith et al., 2013). The time spent in the typical family kitchen has decreased and is one of the main reasons for the rise in processed and boxed food trends. It is much easier to graze (snack) throughout the day by reaching for a prepackaged food than spending time in the kitchen preparing a meal from scratch. This new trend is a game-changer in the field of nutrition as taste has taken over the need for nutrients to ensure adequate growth and development. The change to away from home eating has decreased nutritional quality and caused unwanted weight gain among many Americans, including preschool children, when compared to eating traditionally prepared foods at home, which has been linked to improved overall health, lower body mass index (BMI), and improved longevity (Smith et al., 2013).

The Academy of Nutrition and Dietetics stated that, at least three quarters of nutrients should be consumed by children while they are in child care (Robson, Khoury, Kalkwarf & Copeland, 2015). While there are few recommendations to enhance dietary intake of children attending child care, even less is known about what children eat and drink while they are away from the child care facility (Robson et al., 2015). A study by Robson et al. (2015) indicates that children who attend full time child care may consume more calories than recommended when they are away from the child care facility, but a smaller amount than the suggested portions of whole fruits, whole vegetables, and white cow's milk, compared to the DGA's recommended amounts. Robson et al, discounts the

popular belief that socioeconomic status is a key determinant of healthy food consumption, because they found no difference in fruit and vegetable intake away from the child care facility between children who were eligible for government food assistance and children who were not eligible. However, these authors did find that eligibility for food assistance was associated with higher sugar sweetened beverage consumption by children when they were away from the child care facility.

Fox, Condon, Briefel, Reidy, & Deming (2010) stated that nearly thirty percent of toddlers and twenty-five percent of preschoolers consume whole-dairy, daily, while 2% of dairy is the recommendation. These same percentages of toddlers and preschoolers eat vegetables barely once per day. "French fries were the most commonly consumed vegetable" (Fox et al., 2010, p.6). Almost three quarters of children, both two and three years of age, consumed fruit as a separate food item at least once a day, and a little over half of children aged 2 and 3 years of age consumed 100 % fruit or vegetable juice. Fresh fruit was the most frequently eaten fruit such as apples and bananas. About 85 % of children consumed some type of sugared drink a day such as soda or kool-aid (Fox et al., 2010). Children within this age range have high nutritional needs and moderately low energy needs, but these data indicate that they typically may receive the reverse.

Childhood Obesity as a Nutrition Indicator

Today, about 23 % of children aged 2 to 5 years of age are overweight or obese. Obesity has tripled from 1971 to 2011 (American Heart Association, 2015). Drug abuse and smoking are number two and number three as obesity has reached the top-spot as the number one health issue in (American Heart Association, 2015), which escalates their

risk of becoming overweight or obese adults. According to Wells (2013), obesity can better be clarified not by excluding calories in, but rather by seeing how particular dietary foods upset cellular metabolism and promotes net lipogenesis. This metabolic methodology can additionally be incorporated with more modern modules of how business processes drive the customer patterns that advance obesogenic behaviors (Wells, 2013). Overweight is defined as a human being's Body Mass Index at or above the 85th percentile. Obesity is indicated by a BMI on or above the 95th percentile of the BMI scale (CDC, 2015). In 2009-2010, 16.9% of U.S. children and adolescents had a BMI equal to or greater than the 95th percentile and so were in the obese category (Ogden, Carroll, & Flagal, 2012). In 2008, 2 of every 10 children were obese or overweight (Fox, Condon, Briefel, Reidy, & Deming, 2010), double to what it was 30 years previously.

However, even though they consume excess energy, American children consume inadequate nutrients (Hess & Slavin, 2014). The usual dietary intakes in 2008 were high in fats and salt but not fiber (Fox, Condon, Briefel, Reidy, & Deming, 2010). The prevalence of obesity among preschoolers in the U.S. is a plain indication that problematic consumption patterns begin in early childhood.

There are twice as many obese preschool children around the world since 1980; that is more than 40 million preschool children (Troesch, Biesalski, Bos, Buskens, Calder, Saris & Eggersdorfer, 2015). Troesch et al., (2015) states that more junk foods than healthy foods attribute to childhood obesity. A viable method for covering the requirements for crucial supplements, while evading obesity, is by all accounts a diverse diet, as nourishment differing qualities were found to associate certainty with the nature

of the eating routine (Troesch et al., 2015). A survey by the USDA and DHHS (2015) showed that people consistently tend to eat too much of food groups with large amounts of fats and sugars and not enough fruits and vegetables. This is true for about half to 90% of humans around the world (Troesch et al., 2015). Consumption of carbonated and other sweetened beverages has also added to the obesity problem in children.

The CDC (2015) reported that the obesity rates in children continue to rise, and if the epidemic keeps-up, all Americans will be obese. Most alarming, is the development in children of formerly adult-only diseases like diabetes, fatty liver disease, and hypertension. These diseases have longer-term effects into adulthood. Also, more mothers that are obese and incur gestational diabetes harm their unborn children in and when they come out of utero (Yanovski & Yanovski, 2015).

A solid eating routine is a key part of a sound way of life and nourishment inclinations have imperative impacts on dietary examples. Early childhood is a most opportune time in the advancement of nutrition preferences (Fox, Condon, Briefel, Reidy & Deming, 2010). The prevalence of obesity among preschoolers in the U.S. is evidence that problem eating behaviors begin in early childhood. The rise in obesity and comorbid environments has also led experts to predict a reduction in life expectancy (Babey, Hastert, Wolstein & Diamant, 2010).

In the U.S, children who are obese obviously do not have healthy eating regimes. These healthy eating regimes should be offered in child care facilities as almost 24 million children are overweight or obese and this statistic is from 2007-2010 (Go, Mozaffarian, Roger, Benjamin, Berry, Blaha, & Subcommittee, 2013). Parents may do a

world of good for their children now and in the future if they were educated on nutrition (Fox, Condon, Briefel, Reidy, & Deming, 2010). The child care setting may have a lot to do with healthy eating habits, foods available, policies, curricula, and modeling (Taylor et al., 2015). Healthy eating and healthy eating habits can easily be formed in child care facilities (Taylor et al., 2015). Fifty-five percent of U.S. preschoolers attend child care facilities (Robson, Khoury, Kalkwarf & Copeland, 2015). Robson et al. (2015) found that children who attend child care facilities may be positively associated with a decreased risk of obesity in later childhood.

Nutrition in Child Care Facilities

In many child care facilities, programs such as the CACFP are in place to make sure that children in attendance can consume the appropriate nutrients that they need at each meal to develop healthy. However, many child care facilities do not participate in the CACFP or similar programs. State-run programs vary in terms of specificity and rigor, so the possibility exists that some children who attend child care facilities have limited access to nutritious meals (Kaphingst & Story, 2009).

Nutrition Regulations for Child Care Settings

In the specific state of my study, this Southeastern's state's Division of Health and Human Services (2015) has explicit rules and regulations pertaining to nutrition in all licensed facilities throughout the state. However, there is no other formal or other training for the providers and directors except to follow the official child care handbook. In this handbook, there are general rules which will be explained in detail in a particular nutrition section. DHHS (2010), states that nutrition and health go together and both are

critical for learning, which means that during mealtimes, physical, mental, and social skills are forming among preschoolers. Children learn how to use their manners, converse with one another, and interact positively. The reason for these and other nutrition requirements in all child care facilities (homes and centers) in this state are to promote the minimal nutrition requirements for all children (DHHS, 2010). There are three key rules that are crucial to maintain the minimal nutrition requirements, they are Child Care Rule.1718(a)(1), Meal Patterns, Child Care Rule.1718(a) (2-3), Nutritional Requirements, and Child Care Rule.1720(d)(6), Refrigerate all Perishable Foods and Beverages.

Meal Patterns. The first of the key rules, meal patterns, follows the guidelines from the National Research Council for appropriate nutrition for children. Further rules state that if a meal is brought from home, it must meet the *Meal Patterns for Children in Child Care*. If the food falls short of the requirements, additional foods must be added to create a complete meal. All directors of licensed child care facilities receive a copy of *Meal Patterns for Children in Child Care*. Non-nutritional foods are allowed on occasions such as birthdays, holidays, and to enhance learning (DHHS, 2010). Other rules that are to be followed, for example, when serving a juice, it must be 100 % juice, milk is served with all meals, a menu is posted for parents with the nutritional information, food allergies are well known for each child in the facility and a written record is in the child's folder, special diets are well known for each child in the facility, and good eating habits are being formed constantly (DHHS, 2010). The lunch meal pattern requirement is as follows for a 1 to 2-year-old aged child: fluid milk: half cup, meat or meat alternative: one ounce or half of an egg or two tablespoons of peanut butter,

or one half ounce of nuts or seeds or four ounces of yogurt, vegetables or fruit: one fourth of a cup, and grains and breads, which must be enriched: half of a slice of bread or one fourth of a cup or cereal or pasta. The lunch meal pattern requirement is as follows for a 3 to 5-year-old aged child: fluid milk: three quarters of a cup, meat or meat alternative: one ounce and a half or three quarters of an egg or three tablespoons of peanut butter, or three quarters of an ounce of nuts or seeds or six ounces of yogurt, vegetables or fruit: one third of a cup, and grains and breads, which must be enriched: half of a slice of bread or one third of a cup or cereal or pasta (DHHS, 2010).

Nutritional Requirements. The nutritional requirements that are punishable if not followed are that every child in care must be fed a meal or a snack at least every 4 hours, water must be available the entire time that children are in care, and only pasteurized milk and juices can be served. Other regulations that must be followed are in cases of hot weather, water must not only be available, it must also be verbally offered to children on a frequent basis. The children in care that may not yet be able to verbalize their needs or special needs children must be offered food and drink more often as they are not able to communicate their needs effectively. The directors and providers should have, labeled with the name of the child, sippy-cups or a pitcher and plastic cups at a child's level so that water may be accessible, by the children, at all times.

The Refrigeration all Perishable Foods and Beverages. According to DHHS (2010), all perishable foods and beverages must be refrigerated at all times. The refrigerator in the child care facility must be in good working order and maintain a temperature or 45 degrees Fahrenheit or below. There must be a refrigerator thermometer

inside of the refrigerator at all times and it must be in working order. Left over foods can be kept if they are immediately placed in the refrigerator as soon as the meal is over so that they can be consumed at a later time (DHHS, 2010).

Existing Nutrition Training for Child Care Professionals

In this southeastern state, the training required for child care home providers and child care centers is not ongoing, as in annual classes. However, each director and provider must abide by the statutes set forth by the Division of Child Development as outlined in the Family Child Care Home Handbook, specifically the Best Practices for Nutrition, Physical Activity and Screen Media in Child Care Settings section (DHHS, 2010). This section introduces the CACFP as another means of adequate nutrition, with the advantage of a monetary compensation. The section also mentions methods to prevent obesity (DHHS, 2010). There is an entire section dedicated to options for healthy foods that can be served, the differences between high and low calorie foods, creating healthy meals, and how to prepare safe meals.

Nutrition Oversight

All child care facilities are required to follow the rules and regulations set forth by this state's Division of Child Development. The rules are not enforced on a regular basis as they are, in the area of nutrition, on a food program such as the CACFP, which requires unannounced visits four to six times per year. The yearly visit by the child care consultant, who is in charge of half of the state, which there is only two state consults in this southeastern state, does not constitute strict adherence. When the child care consultant does visit, she has a checklist that she must follow, which includes nutrition

but certainly not just nutrition. She has to make an attempt to make sure that the child care facility director is following an over 700-page handbook of rules in less than a 3-hour visit. This is a significant concern that helped me in my decision to conduct this study. Children need proper nutrition to develop adequately. I do not understand why such an important issue, such as the nutrition of children, is not enforced in all states, by strongly enforcing child care facilities to participate in the CACFP. The results of this study will show the nutrient differences in lunches served at both types of centers; participants and nonparticipants of the CACFP. It is my hope that the CACFP will prevail and have more nutrients so that results will speak for themselves and persuade child care facilities to enroll with the CACFP.

CACFP Nutrition Oversight There are many other rules and regulations set forth by the CACFP that are not a direct result of the rights and responsibilities contract. When the state monitors or CACFP representatives come out to visit a child care facility, they conduct training in areas which include the dangers of drugs, tobacco and alcohol use, and illegal activities. They also conduct sanitation scans which include cleanliness and temperatures of the child care facility itself and the refrigerator. The state monitor usually arrives at a meals time, asks for the records, sets-up her computer station in a place where it is easy to observe the children and the meals being prepared and served, watches the meal preparer use measuring utensils, observes how much the children eat, observes the clean-up, documents all of the paperwork, provides the yearly training, and concludes the visit.

The Child and Adult Care Food Program (CACFP)

The Child and Adult Care Food Program, better known as the CACFP among child care providers, is a program which supports child care facility directors in making certain that participants can feed all children in their care the vital nutrients needed to develop optimally (CACFP, 2015). This program has been around for almost 50 years and has been a lifesaver, literally, for children who may not have nutritional meals available to them at times when they are not at the child care facility. This is a program, though, that does require enrollment; it is not an automatic service to all children that attend a child care facility.

Rationale Behind the Creation and Administration of the CACFP

In a report issued in 2013 (Augustine-Thottungal, Kern, Key, & Sherman, 2013), almost 4 million families in the Unites States do not have healthy food for their children. In 1968, Congress created a program so that children in licensed or approved child care facilities and other establishments could receive nutritious meals (CACFP, 2015). This program began in low socioeconomic neighborhoods. The directors, through contracted independent companies, who represented the CACFP, reimbursed facilities in these neighborhoods for public or private nonprofit institutions. Public Law 95-627 came into action in 1978 and the Child and Adult Care Food Program (CACFP, 2015) was expanded to many other establishments. As the CACFP expanded, the law changed so that private, for profit facilities, receiving Title XX compensation, could participate in the CACFP, and if "at least 25 percent of the children enrolled at each child care facility in each calendar month were Title XX beneficiaries" they could receive benefits (CACFP, 2015, p. 1). This made the program more accessible. The CACFP serves over 3 million

children who are enrolled in their program, daily (USDA, 2015). All family child care homes are eligible to receive these funds, regardless of tuition or socio-economic status. Child care centers must enroll at least 25% of so-called “needy children” to be eligible (CACFP, 2015). Each day children enrolled in CACFP-participating child care programs can receive two nutritious meals and one snack, which meet the USDA guidelines. CACFP supports children living in a food insecure situation if they are enrolled in the program as they are located in numerous cities all across the country where they reach at least one out of five food insecure children (Child Care in America, 2011).

Some child care facilities (homes and centers) may not want to participate in the CACFP program since it may be an inconvenience to serve specific meal components at each meal or serve meals at set times every day. Other reasons that some child care facilities may not want to participate could be that they do not want to be disturbed by monitors and counselors arriving, unannounced, at their facilities. Some child care facilities participate in field trips for the children, in the excitement of the activity, staff may forget to call and report the outing, in which case, this oversight will cause the meal not to be reimbursed. Still other child care facility staff may want to remain private.

Today, the CACFP serves approximately one million low income children in child care facilities across the U.S. (Gordon, Kaestner, Sanders, Korenman, & Abner, 2010). The lunch payment reimbursement rates for lunches currently range from $0.28 to $2.58 (Gordon et al., 2010). The CACFP serves almost 4 million children daily (USDA, 2015). The CACFP is managed through USDA's Food and Nutrition Service federal grants. The state educational agency or a sponsoring agency in each state organizes the

CACFP (USDA, 2015, p.1). Organizations that sponsor the CACFP have agreements with state sponsoring agencies which include but are not limited to all of the proper paperwork and all of the financial paperwork. The organizations that sponsor the CACFP must make certain that the child care facilities that enroll in the program serve the children in their care, who are participants of the CACFP, nutritious meals (USDA, 2015, p.1).

Child care facilities are public or private nonprofit institutions which are licensed or approved to provide child care services (USDA, 2015). "Child care facilities that are a business open for profit, must receive Title XX funds for at least 25 percent of enrolled children or licensed capacity (whichever is less) or at minimum, 25 percent of children in care must be eligible for free and reduced priced meals" (USDA, 2015, p.1). Reimbursement rates are dependent on the child care center's eligibility and the funding that the particular state has, in addition to the state's federal funding budget.

Child care homes must sign an agreement with an independent contractor who proves as a representative of the CACFP. The child care home must be licensed or approved by the issuing state of residence. Reimbursements rates are dependent on the child care neighborhood's socio economic status.

CACFP Processes and Procedures

The CACFP (2015) has specific rules and regulations including what meals are served to the children depending on the hours that they are in attendance. There are other processes and procedures that must be followed as a participant of the CACFP. They

include acceptable serving times, meal components, such as portion sizes, and food credibility. These are all essential elements for reimbursement to take place.

Acceptable serving times. As part of the agreement between the director of a child care facility and the CACFP, strict meal times are established for the facility. The establishment of standard mealtimes permits the CACFP's representative to visit the child care facility at any time, unannounced, to verify the timely service of planned meals and the content of those meals served. This annual agreement must be kept on file at the child care facility and be easily accessible at all times. The child care facility's director is reimbursed for one meal and two snacks that each child consumes while they are in attendance at the child care facility (CACFP, 2015). Many children are in child care for nine or more hours each weekday. Meals times are set by the agency representing CACFP's regulations and those times must be strictly adhered to. If a child is in care, he or she will be served at the time the meal is served regardless of whether the child care facility is reimbursed for that meal or not.

Portion sizes. A serving size is defined as a food measured by weight, number of pieces, or slices meeting the meal pattern and component requirement (CACFP, 2015, p.9). In a typical lunch served in facilities participating in the CACFP program, a child must be offered four meal components in specific portion sizes: fluid milk (a half cup for children up to 2 years old and three quarters of a cup for children ages 3 to 5 years old); a fruit or a vegetable (one quarter cup to a one to two year old and one half of a cup to a 3 to 5 year old; grain such as a half slice of bread or one quarter cup of pasta to a one to 2 year old and half of a slice of bread or one third cup of pasta); and a meat or meat

alternative (such as one ounce of meat or fish or cheese, a half of an egg, or one quarter of a cup of beans, for a 1 to 2 year old and one and a half ounces of meat or fish or cheese, three quarters of an egg, or three quarters of a cup of beans, for a 3 to 5 year old).

Children may not be served less of a portion size if the meal is to be reimbursed. Milk that is served must be fluid and either low fat or skim. Juices served must be full strength and 100% real juice. Breads and Cereals must be whole grain and fortified when serving to the children. A serving of meat or meat alternative must meet the portion size after it is cooked. Nuts must be combined with a meat or meat alternative. Yogurt may be plain or flavored. It is customary to follow these rules and regulations; however, if a child is still hungry, it is permissible to serve him seconds, although not required. Children are not required to eat everything on their plates but they must be served the minimum portion.

Component requirements. There are specific regulations for each meal component to dictate how to handle these situations. I will discuss all four meal components in a typical child's lunch as this is what pertains to my study. They will include portion sizes and the age group it pertains to.

Milk. The CACFP (2015) requires that a portion of milk is served with each meal. Milk must be whole for children under 2 years and 1% for older than 2 years old. The CACFP does not address serving milk to children under the age of 1 year as only breast milk and baby formula are allowed for reimbursement purposes. All milk should contain vitamin A and vitamin D at levels specified by the FDA Farm bought milk must meet state regulations and be pasteurized. Lactose free milk must be available for children who

are lactose intolerant. Other types of milk allowed are goat's milk, cultured raw milk, chocolate or strawberry milk, and soy milk that is fortified.

Milk, as a component in prepackaged products such as pudding, cooked cereals, and custards may not be counted towards the portion requirement for fluid milk (CACFP, 2015). Yogurt may also not be used as a milk substitute, although it may be served as meat alternative. An acceptable milk meal preparation is a homemade milkshake that uses the correct fluid milk portion size for each child served; a fast food milkshake is not credible as a milk component. If a child cannot have any type of milk, the director can still be reimbursed for the milk component of a particular child if he or she has a signed doctor's note on file. If a child cannot consume milk because of religious preferences, he or she must be covered by an exemption from the CACFP national office if the director is to be reimbursed. Milk that is not served because the child is a vegetarian or vegan is not reimbursable.

Meat and meat alternatives. The CACFP (2015) regulations require that all lunches and suppers contain a full portion size of a meat or meat alternative. Meats must be lean. Meat alternatives must be fish, poultry, dairy, and beans (CACFP, 2015). Cooked dry beans and peas may not be counted as the fruit and vegetable component if it is being counted as the meat or meat alternative component. Facilities may use cooked beans from a can or fresh frozen. If shellfish is served, the provider must be certain that no child has a shellfish allergy.

Alternative Protein Products, products processed from soy, may be credible as meat alternatives in dehydrated granule, particle, or flake form (CACFP, 2015). They are

generally used to make a vegetarian patty. Before using these products, the CACFP office must be informed as they must approve these types of products on a case by case situation. When seeds and nuts are used as a meat alternative, they may be counted only as half of the required component. Also, since there are many nut allergies, the directors sand food preparers must be aware of these before a child is served such a food or even is in the presence of prepared nut-based foods. The CACFP does not recommend that children under the age of 3 years be served seeds and nuts.

Some meat and meat alternatives that are credible include beans, dried or canned Canadian bacon, cottage cheese, ricotta cheese, natural cheeses, deviled eggs, commercial fish, prepackaged fish sticks, hummus, and peanut butter. Some meat and meat alternatives that are disallowed include bacon, deli meats, imitation cheeses, imitation crab, cream cheese, homemade yogurt, egg substitutes, home slaughtered meats, and pepperoni. Pizzas must be home made, not purchased from restaurants. If a homemade pizza is served, the meat or meat alternative on the pizza is credible; however, the sauce, vegetables, and crust must be used in the fruit and vegetable component and the grain component. Soups containing meats are not sufficient to be credible. Other commercial, prepackaged products such as chicken nuggets must be approved by the CACFP national office. A portion size must be met for each child when a meat is added to a dish as an ingredient. Even if a child is vegan or vegetarian, only credible foods are allowed; foods such as tofu, seitan, and tempeh are not allowed.

Fruits and vegetables. The CACFP (2015) regulations require that all lunches and suppers contain a full portion size of a fruit or vegetable. Credible fruits and vegetables

include fresh, fresh frozen, canned products, and 100 % juice. No juice cocktail or beverages are reimbursable and cannot be counted as part of this meal component. All fruit juices must be pasteurized. If a fruit and a vegetable are served, only one is reimbursable if is similar, such as apple juice and applesauce. If a combination is served in a meal such as peas and carrots, this can only be counted as one serving. Home canned foods are not allowed to be served at all. Other fruits and vegetable products that are not allowed include banana chips, fruit cocktail cups, potato chips, drinks that have"- ade" in the titles, banana bread, cake, chili, corn chips, froze fruit bars, ketchup, gravy, jelly, muffins, lemonade, maple syrup, and zucchini bread. Some fruit and vegetable products that are allowed include bean sprouts, dried fruit, homemade (but not commercially made) French fries, olives, salsa, pizza sauce, V8 juice, and coleslaw if made with fresh onions, carrots, cabbage, and raisins. Apple cider purchased at an orchard is not reimbursable.

Grains. The CACFP (2015) regulations require that all breakfasts, lunches and suppers contain a full portion of a grain. Some reimbursable grain products include bagels, flour tortillas, corn bread, pancakes that are homemade, pasta, rice, crepes, Italian bread, and pumpernickel bread. Some non-reimbursable grain products include packaged cookies, popcorn, rice pudding, pound cake, and tapioca. Nuts and seeds and not reimbursed as a grain component. Only at Passover, unenriched bread may be served; at all other times of the year, enriched breads must be served such as whole grain, bran, or germ. Frozen or prepackaged pastries can be served twice a week, maximum, and only as

a snack. Granola bars are only reimbursable as a snack component. Snack mixes and trail mixes are not reimbursable.

In addition, CACFP guidelines require meal planning to include a written plan that is posted so that children's parents can see what their child will be eating for the week. Meal plans should offer a variety of foods and of preparation methods; however, it is always recommended to bake and steam foods instead of frying them. These tips and other food ideas are included in the CACFP (2015) handbook given to child care facilities on an annual basis so that all updates are available.

Credibility of foods. To be able to reimburse the child care facility for a particular food served to a child during a scheduled meal, it must be credible. This credibility is determined through the compliance of regulations set forth by the U.S. Food and Drug Administration (FDA) standards of identity, the USDA's standards for meat and meat products, and the standards of the CACFP as a whole (CACFP, 2015). This is clearly written in the CACFP handbook so that when serving a food that includes two or more or the meal components, such as pizza or a salad, it is easy to define the allowed components as long as the portions sizes are followed. A meal component is a food grouped in a certain category, following the CACFP guidelines described previously. Non-credible foods do not count toward meeting meal plan requirements as they do not fit within the above mentioned categories.

Minimum CACFP participant required training. In this southeastern state that is the location of this study, directors, both in child care homes and child care centers, must meet a minimum of two hours of training in nutrition and meal planning annually

(CACFP, 2015). The rules and regulations of the CACFP that must have staff trained are the same for new child care facility directors and participating child care facility directors. The agreement specifies the rights and responsibilities of the child care facility's director, the independent contractor, the state, the USDA, and other state and federal agencies as participants of the CACFP. Sponsoring agency consultants of the CACFP may visit a child care facility at any time while they are open. The state agency has the right to restrict transfers of child care facilities to no more than one time per fiscal year, while the independent contractor can make 4 or more visits per year.

The rights and responsibilities of the independent contractor, representing the CACFP, must train the staff in program requirements, answer questions, provide paperwork, monitor meals, and perform reviews. The independent contractor must review each child care facility at least three times a year and only one visit can be announced. At least one evaluation must take place throughout the child care facility's first four weeks of program setup. Not more than 120 days shall go by among evaluations. Also, the independent contractor must collect applications and determine the eligibility of the enrolled children for free or reduced price meals, upon request of a specific tiered home. All meals must be served to children enrolled without regard to race, color, national origin, sex, disability, or age, and that all meals adhere to the meal regulation patterns for each meal served. The agency must notify each facility of state of approval status, the agency must sign an agreement with the child care facility's director, and handle appeals and terminations.

The child care facility's director must attend yearly training sessions, comply with record keeping of the meals served and children enrolled, serve appropriate portion sizes, adhere to meal times, claim only children present at the time of the meal, serve all children enrolled without regard to race, color, national origin, sex, disability, or age, and allow CACFP representatives into the facility during normal business hours. Directors must also submit paperwork each month in a timely manner, notify the independent contractor of dropped children, notify the independent contractor of the facility's schedule of closings, keep the files of the above mentioned paperwork readily accessible, and inform the independent contractor of the termination of the child care facility.

Eligibility to Participate in the CACFP

Eligibility for participation in the CACFP program is by facility, not by child. It is based on several factors beyond income, including geographic area, lack of resources, and health and safety standards. Some child care facilities may not want to participate in such a program. It may be an inconvenience to serve specific components at each meal or serve meals at set times every day or they may just not want to participate for other reasons.

To be eligible is quite simple. There are only a few requirements. Rates are different depending on the SES status of the provider's geographic location (Gordon, Kaestner, Sanders, Korenman, & Abner, 2010). The type of care, the neighborhood income, the provider income, and the family income of children are the only requirements considered when determining rates (Gordon, Kaestner, Sanders, Korenman, & Abner, 2010).

According to the CACFP (2015), centers located in areas of high poverty or whose enrollment includes at least 25 % of children from low-income families Both tiers are eligible for reduced or free meals, under the 2-tier system. These tiers determine the amount of money that will be reimbursed for each meal. The tiers are income contingent. Tier 1 receives a lower rate than does tier 2. Tier 2 is the poorer area. In some cases, a compliance of an income eligibility statement may be necessary. This statement lets the agency know the family's income and the number of people in the household. The information submitted by each requested child in the child care facility is compared with USDA's income eligibility guidelines (CACFP, 2015).

Actual Participation in the CACFP

Currently, child care facilities enrolling more than 3.3 million children participate in the CACFP (USDA, 2015). The DHHS (2012) funds the CACFP so that children in need can receive the nutrition that their growing bodies need. CACFP child care facility directors need to make menus according to the standards of the USDA using dairy, meat, fruits, vegetables, and grains (CACFP, 2015). There are 4851 child care facilities on the CACFP (FRAC, 2015) of 6900 child care facilities in this southeastern state (Child Care U.S., 2015). Child care facilities must record the meals they serve for each child, daily. There are two methods to submit claim forms: Minute Menu Kids, which is a software program and can be downloaded on any personal computer or CACFP menu worksheets, which must be handwritten and mailed to the independent contracting agency, monthly.

Summary and Conclusions

In conclusion, not enough information is available about the nutrition of meals that children are served in a child care facility, in this and many other states in the country. This information should not be a mystery as children must receive the appropriate nutrients throughout the day so that they may develop optimally. Currently, approximately 70 % of children in the United States are enrolled in child care facilities. Because of the requirements and oversight provided to child care facilities enrolled in the CACFP, the foods served to children in non-CACFP facilities may be quite different in nutritional value from those served in CACFP facilities. The results of this study may provide insight into ways to improve the nutritional quality of foods served to children and enhance current practices in supporting healthy eating in children. The results of this study may provide insight into the efficacy of the CACFP program and into the ability of non-CACFP facilities to provide equal or better nutritional quality to that provided by CACFP facilities. Chapter 3 will consist of the research method.

Chapter 3: Research Method

Introduction

The purpose of this quantitative study was to determine if there are significant differences in the calories and nutritional value of lunch meals offered in facilities that participate in CACFP and in facilities that do not participate in CACFP. Monthly menus, including approximately 20 lunches each, were gathered from 30 randomly-selected child care facilities in a state in the Southeastern United States, resulting in a sample of approximately 600 lunch meals, half from CACFP-participating facilities and half from nonparticipating facilities. I determined if calories and nutrients delivered through meals served at CACFP-participating facilities differed significantly from calories and nutrients delivered in meals served at nonparticipating facilities.

Research Design and Rationale

I chose an ex post facto quasi experimental design for this study. Ex post facto research can be viewed as an experimental research in reverse, in that data exist prior to the study's commencement (Simon & Goes, 2013). Simon and Goes (2013) stated, "This sort of strategy is perfect for conducting social research when it is not possible or acceptable to manipulate the characteristics of human participants" (p. 2). Examples of this design describe my study, such as explaining a consequence based on antecedent conditions or determining the influence of a variable on another variable (Simon & Goes, 2013). Advantages to this design are that the data are likely to be unbiased and attaining "permission to conduct the study is less involved than enrolling participants, and less

time is involved in conducting the study than by creating new data" (Simon & Goes, 2013, p. 4).

I did not choose a qualitative design. Qualitative data can include interviews, video reports, videos of social interactions, and drawings (Packer, 2013). My study was based on numerical measures of nutrients and calories, not on opinions or perceptions, so a qualitative design would not have been suitable. A quantitative, not a qualitative design, was able to answer the RQs in a factual manner instead of using questions and answers.

The threat of biased reporting of data was reduced because the menus that comprise the data were completed before those who submit menus for this study knew they were going to be requested. The data from any menu can be easily compared to the other menus. There is a standard metric for recording nutrients and calories, and the data that result from this study will be comparable to future menus or to menus in child care locations outside the state that is the focus of this study.

Research Questions

Two RQs guided this study:

RQ1: To what extent is there a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented?

H_01: There is no significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

$H_1 1$: There is a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

RQ2: To what extent is there a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented?

$H_0 2$: There is no significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

$H_1 2$: There is a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented

Data were derived from monthly menus submitted by 30 selectively chosen child care facilities, half of which participate in the CACFP and half of which do not. Each menu included descriptions of approximately 20 lunch meals, which resulted in about 600 lunches that composed the sample.

Methodology

The procedures used to conduct this study are described in this section. Included are descriptions of the population, the sample and sampling process, data collection, instrumentation including operational definitions, and the data analysis plan.

Population

The target population was comprised of child care facilities operating in a state in the southeastern United States and included in Child Care Centers U.S. (Child Care Centers U.S., 2015). A total of more than 5,000 of child care facilities were included in this list. This list designates facilities that were participating in the CACFP and that were not participating at the time the list was compiled. I selected my 30 facilities from the 5,000, using the protocol that I describe in the next section.

Sample and Sampling

The Child Care Centers U.S. list indicates e-mail addresses of facilities of those addresses offered by facility administrators. My first task in selecting the sample was to discard all centers for which an e-mail address was not provided. After that was complete, I moved forward with the next task, which was randomly selecting the child care facilities participating and not participating in the CACFP.

The Child Care Centers U.S. list also indicates that approximately 4,800 child care facilities operating in the state of the study site participated in the CACFP, and that approximately 2,100 facilities did not participate. To choose 15 facilities that participated in the CACFP, I chose, by selective sampling, every 320th facility from among the 4,800 CACFP-participating facilities (4800/320 = 15). To select 15 facilities that did not participate in the CACFP, I chose every 140th facility from among the 2100 non-participating facilities (2100/140 = 15). In addition, I chose another 10 facilities in each participation category to serve as reserve facilities in case personnel at any of the selected facilities failed to respond to my request for a lunch menu. These 20 alternate facilities

were selected by choosing the facility that followed the first 10 selected facilities in each participation group on the list.

To create the sample of menus from which data were derived, I sent an e-mailed request to the designated administrator at each of the selected child care facilities, asking that they e-mail to me their most recent monthly menu of lunch meals. A follow-up e-mail was sent 1 week after the first to remind administrators from whom menus have not yet been received. A second follow-up e-mail was sent 2 weeks after the initial e-mailed request. The same initial e-mailed request was sent to administrators at the alternate facilities if menus were not received from any of the originally requested facilities 3 weeks after the initial e-mailed request.

In a similar study to mine, Farris et al. (2015) compared the number of sweets to fruits and vegetables packed in sack lunches brought to school by preschool and kindergarten students attending one of three schools in a rural area of the southeastern United States. The data were collected for 5 days of school, resulting in a sample of 561 lunches. Farris et al. measured nutrients according to what the children brought in their sack lunches, using a Mann-Whitney-Wilcoxon test to determine significance. Significant differences ($p < 0.01$) were found for calories, carbohydrates, and fats but not for proteins ($p = 0.91$).

The sample size and effect size of my study was similar as I intended to receive 30 menus comprised of 20 lunch meals each, for a total of 600 lunch meals, of which half represent CACFP-participating facilities and half nonparticipating facilities. Also, this

sample of 600 lunch meals (300 per comparison group) exceeds the minimums described for analysis of difference, according to VanVoorhis & Morgan (2007).

Data Collection

Data were collected via e-mail, as in the previous section. As menus were received, menu components were entered into an Excel spreadsheet with columns for the levels of the independent variables: calories, carbohydrates, fats, and proteins, and for CACFP participation or lack of participation. This process of data organization commenced with the first menus received and continued throughout the period during which menus were submitted.

Instrumentation

The National Nutrient Database for Standard Reference Release 27 (USDA, 2016) served as the basis for determining calorie and nutrient levels in lunch meals submitted for analysis. This database was created by the USDA and is evaluated and updated on a regular basis (CITE). The data were reliable as most child care facilities rely on the USDA for nutritional recommendations (CITE). Calories and nutrients were adjusted to the menu-indicated serving size if that was different from the serving size indicated on the database. All nutrients were recorded in grams; calories were recorded in kilocalories.

Data Analysis Plan

I calculated the average content per lunch for each nutrient category and calories. These average calculations were first compared to dietary targets for single meal nutrients and calories. I then calculated the percentage of difference between dietary targets and

actual meal content and presented this number as a decimal fraction. This analysis yielded a first impression of overall meal fitness.

Subsequently, meal nutrient and calorie decimal fractions of dietary targets were grouped according to CACFP participation or nonparticipation. A MANOVA test with four levels was used to determine differences between nutrient categories and calories of lunches served by CACFP-participating and nonparticipating facilities. A MANOVA test permitted me to compare two means from two independent (unrelated) groups using the F-distribution ("Statistics How To", 2016). In this study, the independent variable was represented by participation or nonparticipation in CACFP and four nutritional components (calories, carbohydrates, fats, and proteins) comprised the dependent variables.

Threats to Validity

I accepted that menus submitted by administrators reflected actual lunch meals served and that no other foods were served during lunch than what was recorded on menus. I presumed that any facility's designation as participating or not participating in CACFP on the list of Child Care Centers U.S. was true at the time its menu was created. I understand that there may have been a difference between what was served and what children actually consumed but presumed that these differences were the same without regard to facility CACFP and non-CACFP participation. Also, Type I (false positive; *p* value) and Type II (false negative) results may have occurred. Tier I was set to .001 as the level of significance to try and avoid errors. The reason this was not the usual setting of .05 or .01 was because the study was large.

Ethical Protections

No personal information such as names and addresses of administrators or facilities were recorded. Only the e-mail address and CACFP-participation status on file as matters of public record were retained for use in this study. The submission of a menu in response to my e-mailed request constituted consent to participate in the study. No children were used or identified, in any way, in this study. This study was approved by the Walden University Institutional Review Board and the approval number was 04-27-16-0193473.

Summary

Menus provided by administrators at child care facilities in one state in the southeastern United States provided the data for analysis of the nutrient content of lunches served at CACFP-participating and nonparticipating facilities. Food composition for each meal was then determined by using the National Nutrient Database for Standard Reference Release 28 (USDA, 2016), with regard to calories, carbohydrates, fats, and proteins. The purpose of this study was to determine if calories and nutrients delivered through meals served at CACFP-participating facilities differed significantly from calories and nutrients delivered in meals served at nonparticipating facilities. I will present the results of this study in Chapter 4 and will discuss those results in Chapter 5.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to determine if there are differences in the calories and nutritional value of lunch meals offered to preschool children in facilities that participate in CACFP and in facilities that do not participate in CACFP. The four categories that were measured in this research study included calories, carbohydrates, fats, and proteins. I obtained 30 monthly lunch menus, 15 menus per group, from child care facilities via e-mail. These menus were then analyzed to compare the above four categories within the recommended portion sizes, as set forth by the DHHS for preschool aged children 3 to 5 years of age, to determine if these menus reflected different levels of nutrients for enrolled children to grow optimally. The RQs and hypotheses that guided this study were:

RQ1: To what extent is there a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented?

$H_0 1$: There is not a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

$H_1 1$: There is a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

RQ2: To what extent is there a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented?

H_02: There is not a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

H_12: There is a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented.

Data Collection

Data collection consisted of the attainment of 598 lunch menus via e-mail from 30 child care facilities selected at random from a list of those operating in a single state in the southeastern United States. I sent administrators at each of the selected child care facilities an e-mail request to reply with a copy of a month of menus from that facility. The e-mail reply period was set to 14 days. The time limit was appropriate, since the target number of 30 menus was received. I extracted the data results using SPSS, and used the MANOVA format to construct data tables. Analysis included 600 lunch menus that were categorized into two groups, CACFP participants and non-CACFP participants, using four variables: calories, carbohydrates, fats, and proteins. There was only one discrepancy in data collection from the plan presented in Chapter 3, in that only 298 menus were recorded in the non-CACFP list instead of the 300 that were expected.

Descriptive Statistics

I calculated the mean values for the four dependent variables of calories, carbohydrates, fats, and protein for the menus as a whole and for menus by group (CACFP and non-CACFP participation). The descriptive statistics for the dependent variables of calories, carbohydrates, fats, and proteins are presented in Table 1. These means represented values for the independent variables. Mean calories-per-meal for the entire group of menus numbered 360 (M = 360.22, SD = 94.86), with more calories on average, in the non-CACFP meals (M = 374.21, SD = 103.40), compared to the CACFP meals (M = 346.33, SD = 83.41). Variation in calories-per-meal was greater for the non-CACFP group. Average carbohydrates-per-meal for the entire group of menus numbered about 50 g (M = 50.23, SD = 15.57), with more carbohydrates on average, in the non-CACFP meals (M = 51.30, SD = 16.80), compared to the CACFP meals (M = 50.23, SD = 14.20). Average fats-per-meal for the entire group of menus numbered about 10 g (M = 9.89, SD = 6.75), with more fats on average, in the non-CACFP meals (M = 10.78, SD = 7.61), compared to the CACFP meals (M = 9.89, SD = 5.63). Average protein-per-meal for the entire group of menus numbered about 20 g (M = 20.41, SD = 9.03, with more proteins on average, in the non-CACFP meals (M = 21.20, SD = 7.73), compared to the CACFP meals (M = 20.41, SD = 10.12).

Table 1

Mean Nutritional Factors by Group

Variable	Group	*M*	*SD*	*N*
Calories	Total	360.22	94.857	598
	non-CACFP	374.21	103.395	298
	CACFP	346.33	83.413	300
Carbohydrates	Total	50.23	15.574	598
	non-CACFP	51.30	16.797	298
	CACFP	49.16	14.203	300
Fats	Total	9.89	6.746	598
	non-CACFP	10.78	7.614	298
	CACFP	9.00	5.630	300
Proteins	Total	20.41	9.033	598
	non-CACFP	21.20	7.725	298
	CACFP	19.62	10.120	300

Correlations were run on the dependent variables to determine the relationships among them, as illustrated in Table 2. MANOVA tests demonstrate significant differences in each group of dependent variables of calories, carbohydrates, fats, and proteins with the exception of carbohydrates. In the non-CACFP group the means and standard deviations of calorie, carbohydrate, and fat totals were higher than in the CACFP group. In the CACFP group the SD total of proteins were higher but the means were higher in the non-CACFP group.

Table 2

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	*df*	Mean Square	*F*	*p*
Corrected Model	Calories	116215.962	1	116215.962	13.180	.000
	Carbohydrates	685.931	1	685.931	2.837	.093
	Fats	474.671	1	474.671	10.598	.001
	Proteins	373.842	1	373.842	4.609	.032
Intercept	Calories	77616530.243	1	77616530.243	8802.160	.000
	Carbohydrates	1508829.236	1	1508829.236	6240.147	.000
	Fats	58502.096	1	58502.096	1306.143	.000
	Proteins	249121.320	1	249121.320	3071.335	.000
Group	Calories	116215.962	1	116215.962	13.180	.000
	Carbohydrates	685.931	1	685.931	2.837	.093
	Fats	474.671	1	474.671	10.598	.001
	Proteins	373.842	1	373.842	4.609	.032
Error	Calories	5255466.011	596	8817.896		
	Carbohydrates	144109.139	596	241.794		
	Fats	26694.822	596	44.790		
	Proteins	48342.599	596	81.112		
Total	Calories	82968992.000	598			
	Carbohydrates	1653426.000	598			
	Fats	85637.000	598			
	Proteins	297776.000	598			
Corrected Total	Calories	5371681.973	597			
	Carbohydrates	144795.070	597			
	Fats	27169.493	597			
	Proteins	48716.441	597			

Data Handling and Statistical Assumptions

My original plan was to conduct a two-way ANOVA via SPSS. After careful consideration, I made the decision to use a MANOVA as the way to test my hypotheses because I had four dependent variables that had an effect on a set of two groups. MANOVA assumes that all of dependent variables were distributed normally, that linear combinations were distributed normally, and that all subsets of the variables had a multivariate normal distribution (SPSS, 2011). MANOVA also assumes that the

covariance matrices are homogeneous (SPSS, 2011). A Box's test of equality of covariance matrices is used to determine whether two or more covariance matrices are equal, which I determined to be not the case for these data.

Table 3

Box's Test of Equality of Covariance Matrices

Box's M	197.171
F	19.575
df1	10
df2	1698070.940
p	.000

Note. Box's M tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

Because asymptotic significances were displayed, a nonparametric Mann Whitney test was run to confirm the validity of the data. The significance level was .05 in the Mann Whitney Hypothesis Test Summary as depicted in Table 4. Further, I ran a correlations test, the results of which are depicted in Table 5. To measure effect size, I used Cohen's standard to evaluate the correlation coefficient to determine the strength of the relationship, or the effect size, where coefficients between .10 and .29 represent a small association, coefficients between .30 and .49 represent a medium association, and coefficients above .50 represent a large associate or relationship ("Statistics How To," 2016).

Table 4

Mann Whitney Hypothesis Test Summary

Null Hypothesis by RQ	Test	Significance	Decision
1. The distribution of calories is the same across categories of group	Independent Samples Mann-Whitney U Test	p = .003	Reject the null
2. The distribution of carbohydrates is the same across categories of group	Independent Samples Mann-Whitney U Test	p =.094	Confirm the null
3. The distribution of fats is the same across categories of group	Independent Samples Mann-Whitney U Test	p =.020	Reject the null
4. The distribution of proteins is the same across categories of group	Independent Samples Mann-Whitney U Test	p =.000	Reject the null

Note. Mann Whitney Hypothesis Test Summary rejects the null hypotheses with the exception of the carbohydrate comparison.

Table 5

Correlations f^2 *Between Factors with Significance* p

	Calories f^2/p	Carbohydrates f^2/p	Fats f^2/p	Proteins f^2/p	Group f^2/p
Calories		.716/.000	.670/.000	.340/.000	.147/.000
Carbohydrates	.716/.000		.214/.000	.278/.000	.069/.093
Fats	.670/.000	.214/.000		.218/.000	.132/.001
Proteins	.340/.000	.278/.000	.218/.000		.088/.032
Group	.147/.000	.069/.093	.132/.001	.088/.032	

Note. N = 598

Results

The results of these statistical tests showed that in the non-CACFP group, the mean values for fats and protein were significantly different from those of the CACFP group. For both fats ($p < .001$) and proteins ($p < .05$), the mean values were larger in the non-CACFP menus. No significant difference was found for carbohydrates ($p = .09$). The null hypothesis for RQ1 that there is not a significant difference in nutrient content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented was rejected because statistically significant differences were found.

The results of the MANOVA test showed that the non-CACFP group menu totals were also higher in calories than those of the CACFP group. This difference was significant ($p < .001$). Therefore, the null hypothesis that there was not a significant difference in calorie content between lunches served in settings where the CACFP is implemented and settings where the CACFP is not implemented was rejected in light of this significant finding.

Additional Findings

The significantly greater amounts of calories, fats, and proteins found in the non-CACFP menus compared to the CACFP menus suggested that a qualitative difference in meals served exists between the two groups. I was curious to know if this difference might be apparent in the descriptions of meals provided by each facility. To that end, I selected menus from each of the child care facilities for a single day, which was the first day of menus each facility provided, and created a chart in which the meal descriptions

were presented in two columns, one for facilities that participate in CACFP and the other for facilities that do not participate in CACFP. In this visual analysis, I focused on calories and fats, since those showed the greatest degree of significant differences between the two groups.

I assumed that a difference in calories was likely to occur under two conditions--a difference in portion size or a difference in fat content. It seemed unlikely that the non-CACFP facilities would routinely feed children larger portions than would the CACFP facilities, in part because of the greater food costs incurred by larger portions and also because there is little reason to believe that small children would actually eat more if larger portions were provided. However, calories-per-gram were greater for fat (9 c/g) than for either proteins or carbohydrates (4 c/g for each; USDA, 2016). This suggested that foods served by non-CACFP facilities were qualitatively different from foods served by CACFP facilities in the area of fat content and that this is responsible also for the difference in calorie content.

This qualitative difference was apparent in the meal descriptions provided by the facilities on the first day listed in each facility's menus. Five non-CACFP menus included foods that typically are battered or fried (such as chicken patties and fish sticks), but only two such foods appeared in the CACFP menus for that day. In addition, non-CACFP menus seem to include more prepackaged foods or ingredients such as (canned) mixed fruit mandarin oranges, crispy fries, and Fritos, than did the CACFP menus. Although it was not possible to definitively assess the quality of foods served from just the

descriptions, the descriptions presented in Table 6 suggested a greater inclusion of fatty and highly processed foods in the non-CACFP meals compared to the CACFP meals.

Table 6

The First Day of Menus for each of the Child Care Facilities, by Group

Non-CACFP	CACFP
Grilled cheese sandwiches with mixed vegetables, pears, & milk	Kielbasa with sauerkraut hoagies, pineapples, & milk
Chicken patty sandwich, bun, green beans, pears, & milk	Chicken sandwiches, carrots, pears, & milk
Chicken & rice, mixed vegetables, pears, & milk	Cheesy noodles, peas, pears, & milk
Macaroni & cheese, broccoli, pears, & milk	Beef tortillas, carrots, mixed fruit, & milk
Vegetarian lasagna, carrots, pears, & milk	Eggs, toast, mixed vegetables, banana, & milk
Tater-tot casserole, chicken, cheese, broccoli, applesauce, & milk	Meatball stroganoff, carrots, oranges, & milk
Pasta primavera, mixed vegetables (2), & milk	Chicken, crackers, green beans, peaches, & milk
Turkey burger with cheese, WW bun, crispy fries, mandarin oranges, & milk	Chicken patty, bun, carrots, pears, & milk
Chicken, rolls, sweet potatoes, mixed fruit, & milk	Lasagna, WW bread, salad, mixed vegetables, & milk
Frito pie (ground beef, pinto beans, Fritos, cheese), apples, & milk	Goulash, green beans, pears, & milk
Fish sticks, green beans, mandarin oranges, & milk	Beef meatballs, WW pasta, corn, peaches, & milk
Cheeseburgers, French fries, oranges, & chocolate milk	Yogurt, sourdough bread, corn, cantaloupe, & milk
Turkey & cheese sandwich, pickles, applesauce, & milk	Hot dogs, buns, tater tots, oranges, & milk
Chicken nuggets, WW roll, spinach, oranges, & milk	Parmesan chicken, WW roll, broccoli, apples, & milk
Penne pasta, cheese, tomato salad, mixed fruit, & milk	Lasagna (ground beef, cheese), WW roll, green beans, mandarin oranges, & milk

Note. WW = whole wheat

Summary

Directors of 30 child care facilities in one state in the southeastern United States responded to an e-mail request to provide a month of lunch menus so that I could conduct an analysis comparing nutritional content of meals served to preschool children by CACFP participants and non-CACFP participants. Menus were compared in calories, carbohydrates, fats, and proteins. My analysis revealed statistically significant differences in calories, fats, and proteins, with greater amounts of each of these factors evident in non-CACFP menus compared to CACFP menus. No significant difference was found in carbohydrates. In Chapter 5, I will compare these findings to the literature, present the implications that could be concluded from these findings, and suggest recommendations for child care nutritional practice.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to determine if there are significant differences in the calories and nutritional value of lunch meals offered in child care facilities that participate in CACFP and in facilities that do not participate in CACFP. In this study, I used an ex post facto quasi experimental design to compare 30 menus comprising 598 lunch meals from randomly-selected child care facilities operating in one state in the southeastern United States, half of which participated in CACFP and half that did not. I then compared the calorie, carbohydrate, fat, and protein content of meal components using SPSS software to conduct a MANOVA test. Significant differences were found for calories, fats, and proteins. These meal components were greater for non-CACFP facilities than for CACFP facilities. No significant difference was found for carbohydrate content. In this chapter, I will further discuss the implications of the findings, limitations of the study, recommendations for further research, recommendations for practice, implications for positive social change, and conclusions.

Interpretations of the Findings

The intention behind the creation and implementation of CACFP was to support children in child care facilities and compensate directors to make certain that these children received the vital nutrients needed to develop optimally (CACFP, 2015). The assumption appears to be that nutritional intake is at risk for many preschool children (among other vulnerable populations), so that guidance and financial support for nutrition is a worthy use of federal government funds (CACFP, 2015; USDA, 2015). The results of

my study indicated that a difference does exist between meals served in child care facilities that participate in CACFP and those that do not, particularly in the greater amount of fat, and therefore, of calories in meals offered at non-CACFP facilities.

Ford et al. (2013) found that between 1989 and 2008, U.S. preschool children's intake of sugar, fat, and salt greatly increased. Similarly, these same authors pointed out that use of prepared foods is at an all-time high and tends to increase the amount of less-desired nutritional components, particularly fats, in consumers' diets. The FITS showed that young children consume an abundance of saturated fats, salt, and calories in their daily diets (Briefel et al., 2010). According to Briefel et al. (2010), too many preschoolers have diets that lack the appropriate amounts of fruits, vegetables, and whole grains, and too many preschoolers consume an abundance of sodium, sweets, and saturated fats throughout the day. The results of the current study confirm evidence from the literature that children in many child care facilities are offered meals higher in fats and calories than was the case in other facilities. The apparent cause of this difference was facilities' participation or non-participation in CACFP.

Ajzen (1991) stated that even though individuals, like child care providers, may have good intentions, for example of feeding the children in their care nutritiously, those individuals may lack key motivational factors of positive attitude, positive social pressure, or perceived behavior control. In this study, the difference between the meals offered by CACFP and non-CACFP facilities may indicate differences in the last two of these factors. It is reasonable to assume that all the child care administrators who submitted menus in this study have a positive attitude toward children and a sincere

desire to feed them appropriately. However, the fact that meals served by CACFP facilities appear to be superior to those served by non-CACFP facilities in the area of fats and calories suggests that the added social pressure of CACFP oversight and unannounced visits may motivate administrators of those facilities to attend more closely to nutritional content than do administrators of facilities that do not participate in CACFP. In addition, the financial support provided through CACFP may increase the level of perceived behavior control felt by CACFP-participating facility administrators, as they may feel able, monetarily, to afford better food in the form of more fresh fruits and vegetables and fewer processed and factory-prepared meals. Ajzen's (1991) factors of positive social pressure and perceived behavior control appear to be key factors in menu quality resulting from participation in CACFP.

Limitations of the Study

The sample for this study was specific to a single state even though the CACFP is a federally-funded program available to child care facilities in the entire United States. In addition, the number of facilities from which menus were solicited represents only a subset of the child care providers operating in the state that was the location of this study. Therefore, the ability to generalize these findings to others states in the United States, or even to all child care facilities in the target state, is limited. Only a single month of menus was requested, leaving open the possibility that over an entire year of menus, differences in food quality, perhaps based on seasonality of local produce or other seasonal food customs, might occur. Therefore, it is possible that even for the facilities queried for this

study that the menus presented may not offer an accurate picture of the nutritional value of meals served.

Recommendations for Further Research

Results of this study indicated that nutrients served to children varied by facilities' participation or non-participation in CACFP. It also was suggested that cooking methods vary among child care facilities that participate in CACFP and those that do not participate, with the apparent inclusion of battered and fried foods in menus presented by non-CACFP facilities. Further research might focus on cooking methods and on use of processed ready-to-heat meals, since these may be key factors in the differences noticed in this study. In addition, more research to shed light on the significantly greater protein content evident in non-CACFP meals would help to determine the source of this difference and its possible impact for children. Additional research over a longer duration than a single month, so that seasonal differences in food choices could be examined, would also help in determining the actual differences in CACFP and non-CACFP meals.

I further recommend future research which would include sodium and sugar content in addition to calories, carbohydrates, fats, and proteins. This may explore even further into the required nutrients that children need and the nutrients that they actually consume. I also recommend additional studies that delve deeper into the CACFP, with rules that are stricter than state guidelines, and how child care facility directors who participate in the CACFP understand these rules differences.

Recommendations for Practice

Obesity in children has tripled from 1971 to 2011 (American Heart Association, 2015) because more processed-foods are being served to children (Smith et al., 2013; USDA, 2015). More people rely upon convenience-foods that require little or no preparation, such as chips, cookies, and frozen and canned foods (Smith et al., 2013). The results of this study suggest that use of processed convenience foods may be a factor in the significantly greater fat and calorie content of meals served in non-CACFP child care facilities compared to facilities that participate in CACFP, and this suggests a lack of understanding of nutrient content of foods and how that content is impacted by preparation methods. One recommendation for future practice is to educate child care directors and staff about the nutritional content of foods and about cooking methods and choices that negatively affect nutritional content.

I also recommend that the CACFP be more widely adopted. The oversight provided by CACFP inspectors and the financial support of CACFP appear to be effective in improving nutritional quality of meals served to children. This will be a positive change.

Implications for Positive Social Change

Troesch et al. (2015) suggested that for the most part dietary recommendations are ignored, which leads to children's overconsumption of empty calories and causes the needed nutrients that come from fruits, vegetables, and whole grains to fall short in the diet. A survey by the USDA and DHHS (2015) showed that people consistently tended to eat too much of food categories with recommended minimal intake, like fats, and too

little of foods where maximal amounts were advised, like fruits and vegetables. Obesity is linked to insufficient intake of the proper nutrients and the overabundance of empty calories (USDA, 2015). There is increasing data that good nutrition promotes health and well-being, specifically in early childhood and the importance of nutrition early in life was recognized at the United Nations' General Assembly in 2011 (Troesch et al., 2015). Increased adoption of programs like the CACFP can help control the epidemic of obesity in preschool children and can promote children's optimal development by focusing attention in child care facilities of providing children with proper nutrients.

The results of this study may be useful for promoting participation in CACFP and thereby supporting optimal development of children who attend child care. These results may also be useful in planning rule requirement changes at the state and national level, to more closely mirror the requirements of CACFP. I intend to share my findings to all of the participants in my study and I also plan to contact the office of the CACFP in the state that was the location of this study, the National Association for the Education of Young Children, the U.S. DHHS, and the Division of Child Development. I will create and present a workshop for early childhood practitioners on the critical importance of childhood nutrition in the early years.

Conclusion

Through this study, I have revealed that even though directors of child care facilities follow state nutritional regulations and recommendations, fat and calorie content of meals served may be greater in facilities that do not participate in CACFP. This may increase the risk of childhood obesity. The social pressure and financial support provided

to facility directors through CACFP appear to be key factors in nutritional quality, as suggested by Ajzen (1991).

For many small children, meals served in child care comprise most of their daily food intake. It is imperative that these meals conform to the highest standards for nutritional quality to support children's physical development and intellectual growth. A simple way to ensure children's futures is to feed them well. Child care providers can be rallied, through programs like CACFP, to help children become their best selves, simply by changing something these providers do every day--choose and prepare foods for children to eat.

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Appendix: Invitation to Participate

From: XXXXXXXXX
Bcc: Email Addresses
To: XXXXXXXXSubject line: Lunch Menu Requests for a Doctoral Study

Dear Director,

I am a former child care center director and now a PhD student in Early Childhood at Walden University. As part of my program, I am conducting a research study on the kinds of foods preschool children eat during the day. To conduct this study, I would like to collect monthly menus from child care facilities chosen at random from across North Carolina. Your facility is one that was randomly selected. *Could you please send me your menu calendar for the month of March?*

If you have your menu calendar for March as a Word document or pdf file, please attach it to this email when you reply. If your menu calendar is a paper copy only, you could take a picture of it with your phone and email it to me. Please do whatever is easiest for you and whatever method creates a clear, readable menu.

This information will be kept anonymous and your child care facility will not be mentioned at all in my study. When the study is complete, I will send you an email detailing the results

Thank you for your assistance with my study. I am anxious to begin this project so I hope you can send me your menu calendar today. Thanks again!

Melissa L Williams Email: XXXXXXXXX