

FOOD ENVIRONMENTS OF SOUTH CENTRAL TEXAS CHILDCARE CENTERS

by

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DEDICATION

To my amazing fiancé, James and wonderful mother, Bonnie.

Thank you for the unwavering support and unconditional love.

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CHAPTER I: BACKGROUND

Introduction

Of increasing concern is the rise in the incidence of childhood obesity. In the United States in 2011-2012 22.8% of children two to five years old were classified as overweight and 8.4% were classified as obese, which is a significant decrease from 2003-2004 when 13.9% were obese.¹ This continues to be a large percentage of the population and therefore, obesity prevention remains a national priority. In the United States, intakes of foods that have a preventative effect on childhood obesity, such as fruits and vegetables, are lower than recommendations.^{2,3} According to secondary analysis of the National Health and Nutrition Examination Survey (NHANES) data, children consume too many calories from solid fats, added sugars, and refined grains.^{4,5} Additionally, children in the United States do not consume the recommended amount of dairy.⁶ Childcare centers (CCCs) have the ability to modify healthy behaviors of children, contribute to consumption of recommended levels of important food groups, thereby reducing of intake of unnecessary calories. It is crucial to examine opportunities for providing a healthful environment in childcare facilities, a key juncture at which children may learn eating habits and food preferences to help combat childhood obesity.^{7,8}

Obesity

Childhood obesity has reached an epidemic level. According to 2011-2012 NHANES data, 22.8% of children ages two to five years old are overweight, and 8.1% are obese.¹ Children with a lower socio-economic status may have a higher risk to become overweight and obese.⁹ Adolescents of families that fall below 130% of the federal poverty level threshold are two

times more likely to become overweight, when compared to adolescents from families above the same poverty level.² The disparities in obesity prevalence among U.S. children and adolescents of different ethnic and racial backgrounds are substantial.¹⁰ Hispanic boys two to nineteen years of age are at a higher risk for becoming obese, compared to non-Hispanic white boys of the same ages.¹⁰ Also, non-Hispanic black girls are at a higher risk for becoming obese than non-Hispanic white girls.¹⁰

It is crucial to the efforts of combating childhood obesity that interventions are developed to target risk factors and root causes of childhood obesity.¹¹ Two primary lifestyle contributors to childhood obesity are unhealthy diet and lack of physical activity. These two risk factors can be modified by reducing exposure to foods of minimal nutritional value and decreasing sedentary behaviors such as screen time.¹¹ Additionally, Rahman et al. cite the importance of modifying social norms and behaviors through healthy and active environments, in conjunction with implementation of policies that impact the environment for nutrition and physical activity.¹¹

Specific Nutritional Concerns

The 2010 Dietary Guidelines for Americans recommend that children over the age of three consume 2 ½ cups of fruits and vegetables daily; children ages two to three years and ages four to eight years consume 2 cups and 2 ½ cups of fat-free or low-fat milk and milk products, respectively.¹² These guidelines also recommend consumption of at least half of children's intake of grains from whole grain sources.¹² Current intake of fruits, vegetables, whole grains, and dairy products are lower among children than these recommendations. According to Lorson et al., NHANES data illustrated that children and adolescents consume more than 28% of their total vegetable intake from French fries.⁵

The analysis also showed that among two to five year old children, over 40% of total fruit intake came from 100% fruit juice which is low in fiber and high in sugar.⁵ Fruit juices and flavored drinks are the second and third largest contributors to caloric intake among toddlers.¹³ O'Neil et al. showed through diet analysis that children ages two to five only consume 0.45 servings of whole grains per day,⁴ and children ages two to twelve years drank lower amounts of milk than the recommended guidelines by only consuming 1.2 cups of milk per day.⁶ For the prevention of obesity, it is recommended that children increase fruit and vegetable consumption, reduce intake of calories from sugar sweetened beverages, limit consumption of refined grain, and increase the consumption of fat-free and low fat dairy products.¹² More studies need to work with early childhood population groups to improve these behaviors, and bring consumption of important nutrient dense foods to the recommended levels in the effort to prevent childhood obesity.¹⁴

Texas Childhood Obesity Concerns

The number of overweight and obese children varies by state and region. From 2007-2008 in the United States, children and adolescents from two to nineteen years of age, 11.9% were at or above the 97th percentile of the BMI-for-age growth charts. In addition, 16.9% were at or above the 95th percentile as reported by NHANES data.¹⁵ Data from the 2004 – 2005 School Physical Activity and Nutrition (SPAN) III Survey show that 42% of Texas fourth graders are overweight or obese, a much higher percentage than seen in the rest of the United States (US).¹⁶ According to 2007 Texas Women, Infants, and Children (WIC) program data, 21.3% of children 2 - 5 years old were overweight or obese. The highest rates were found among Hispanic and American Indian/Pacific Islanders.¹⁷ Based on 2007 national statistics illustrated by the Childhood Obesity Action

Network, Hispanic children in Texas represent the highest rate of overweight and obesity at 47% compared to 27% of black non-Hispanic children and 23% of white non-Hispanic children.¹⁷ More concerning, local FITNESSGRAM® data showed 39% of children in the eighth grade attending San Marcos ISD are obese, and 13% of children in the eighth grade are overweight, resulting in a total of 53% of eighth grade children being overweight or obese.¹⁸ Compared to state and national statistics San Marcos ISD numbers of overweight and obese children are significantly higher, representing half of the eighth grade population being overweight or obese. These numbers illustrate an urgent need for local intervention. It is critical to address the areas that are of greater need due to the magnified effects of low income and minority populations.

Key concepts for this study

In this study, food availability, nutrition promotion, nutrition messages, and adult nutrition behavior modeling, from this point will be referred to as the food environment.

Early Intervention

“Let’s Move”, an initiative to reduce childhood obesity, clearly states that early intervention is paramount for prevention of obesity. Healthy habits learned early in one’s childhood provide an opportunity for the promotion of healthy behavior and healthy weight.¹⁹ The criticality of intervening early in childhood is evident due to the potential to positively influence a child’s weight status during childhood and into adulthood.¹⁹ Furthermore, childcare settings provide an opportunity to introduce children to healthy foods, activities, healthy behaviors and exposure to positive food environments. Strategic interventions for the reduction and prevention of early childhood obesity are required to help prevent detrimental consequences. Such consequences include, but are not limited

to: social rejection, low self-esteem, asthma, early onset of adult diseases including asthma, type 2 diabetes, joint and bone disorders, and sleep disturbance. As a result, these consequences have significant impact on increased health care costs.^{20,21} The childcare setting provides an ideal venue to develop needed multi-component interventions for prevention of obesity in children and the opportunity to reach large numbers of children, their families, and even the childcare workers themselves.⁷

Childcare

More than half of all children in the United States under the age of six are in center-based care arrangements.²² In the United States, CCCs have become the norm due to the fact that 60% of women with children ages 0 – 5 are currently participating in the workforce.²³ According to Capizzano et al., a child can enter childcare as young as six weeks old and remain there until they reach the appropriate age to begin school. In some cases children can spend up to forty hours a week in CCCs.²⁴ On average, children who attend CCCs spend approximately 22.5 hours during the week in this setting, consuming a significant number of their meals and snacks, and obtaining much of their weekly physical activity.^{25,26} Approximately 70% of US children ages five and below are currently enrolled in out-of-home care on a daily basis.⁹ CCCs are one of the places where children learn eating habits and food preferences. Therefore, it is crucial to examine avenues to provide healthful food environments along with environments that are conducive to physical activity in CCCs. Improving childcare providers knowledge regarding the potential to impact childhood obesity in their environment empowers them to facilitate change.²⁷ The Robert Wood Johnson Foundation states that environmental

and policy changes that will generate improved nutrition and more physical activity are needed to revert the obesity epidemic.²⁸

Environment and Childcare Centers

Research has demonstrated that when healthy food is available and accessible in the built food environment, overall dietary intake is improved.²⁹ Reducing obesity in children must use an approach that includes community-level factors of built, social, and natural environments to be successful.³⁰ Children have limited control over their environment. Environmental interventions can empower children by facilitating healthy behaviors and habits.³¹ Such environmental change can occur through modeling by child care providers and providing an environment that encourages, promotes, and influences healthy behaviors. CCC environments have the opportunity to provide a setting where these behaviors can be established in children.

Understanding the specifics of what comprises a healthy environment for children is a topic that continues to be explored in many areas, including the design of communities, retail food environments, and neighborhood food environments. There are many ways to improve the environment in which we live, including community infrastructure, social institutions, food environment and our own homes. There are a number of studies which have examined, measured and developed environmental interventions, and several tools have been developed to assess a range of different environments.^{25,32,33}

System for Observing Play and Recreation in Communities (SOPARC) was developed by McKenzie, Cohen, Sehgal, and colleagues to measure activity and

associated variables of physical activity in community parks.³⁴ This tool examined variables for the community park condition including accessibility, usability and equipment. The tool was used to observe activity of different age groups including children, teens, adults and seniors of different ethnicities including Latino, black, white and other; their activity level in the park was then described as sedentary walking, or active. It was determined that children living in safe areas with access to recreational parks participate in more physical activity, and therefore these children were observed to have better weight management.³⁴

System for Observing Play and Leisure Activity in Youth (SOPLAY), developed by McKenzie, was designed to obtain observational data on the numbers of students and their physical activity levels during play and leisure opportunities in a specified activity area.³⁵ Researchers determined environmental strategies in addition to policies that are needed to improve participation in physical activity among adolescents. Environmental observations allow for a greater depth of understanding of the nutrition environment facilitators and barriers. This study observed boys and girls before school, during lunchtime and after school in an effort to measure physical activity. Environmental observations allow for a greater depth of understanding of the nutrition environment facilitators and barriers.

Oreskovic et al. assessed the built environment along with children's weight, observing differences and similarities in communities with high and low incomes to determine if energy intake or expenditure differed within various populations.³² This study found a positive association between low-income towns in which children lived, and a built environment that fostered high energy intake with few places for energy

expenditure.³² CCCs with an outdoor environment that is more conducive to play with open play areas, tend to have children with higher levels of physical activity than centers that do not have an encouraging outdoor play environment.³⁶

Ward et al. developed an environmental instrument called the Environment and Policy Assessment and Observation tool (EPAO) to assess the environment of CCCs in North Carolina.²⁵ This tool was used during a one day assessment of 82 participating CCCs in North Carolina. Observations during the assessment included interactions between staff and children during meal time, food and beverages that were served to the children, physical activity and nutrition environment, as well as support of the staff for physical activity and nutrition. Results indicated intervention centers did not have a significant increase in EPAO scores compared to control centers.³⁷

Related studies

To the researcher's knowledge, the EPAO is the only published instrument that has been developed to assess the environments of CCCs.²⁵ Four studies used this observational instrument to examine and describe childcare environments.³⁷⁻⁴⁰ Two of the four studies observed and reported observations of the participating CCCs.^{38,40} Neelon et al. examined nutrition practices and mealtime environments, reporting on the 96 CCCs that were assessed during a one-day observation, using the EPAO.⁴⁰ This study focused on the presence of fruits and vegetables, whole grains, high-sugar, high-salt, and high-fat foods, as well as staff behaviors, food availability and service, staff training, education and policies. Analysis showed that there was a lack of fruits and vegetables served; seven centers did not serve a fruit and 15 did not serve a vegetable. High-salt or high-sugar foods were served at 80 of the centers, and there was a significant lack of whole grains

served; 84 of the centers did not serve any whole grains. Juice was found to be served in 22 of the centers, and whole milk was served in 50 of the centers. A written nutrition policy was found in most centers, but the policies focused primarily on Child and Adult Care Food Program (CACFP) standards. Over half of the centers had a written policy specifying holiday and celebration foods served.⁴⁰

Bower et al. examined North Carolina CCCs environments and physical activity over two days using the EPAO.³⁸ The purpose of this study was to further the knowledge and understanding of physical activity environments in CCCs, as well as to find an association between behavior and environment in order to develop more successful ways to encourage physical activity participation among pre-school children. Results revealed that more children participated in moderate-to-vigorous physical activity in centers with supportive physical activity environments, active opportunities, and play equipment.³⁸ Less time was spent by children in sedentary activities in these physical activity-supporting centers.³⁸ These two studies show the need to observe and measure food and physical activity environments to better understand and describe CCCS and develop interventions to increase physical activity and nutrient dense foods that have been shown to help in the prevention of childhood obesity.

Of the four aforementioned studies that used the EPAO, two implemented an intervention in the CCCs.^{37,39} The study by Ward et al. developed an intervention including a self-assessment completed by CCCs regarding their environment. Center staff also selected areas for change; workshops and technical assistance were provided, and post-intervention evaluations were conducted.³⁷ No significant improvement from baseline to follow-up was seen in the environments of the intervention centers, compared

to the control centers.³⁷ Lyn et al., found with implementation of a worksite wellness policy initiative in CCCs that nutrition and physical activity environments of the centers were significantly improved.³⁹ Participating center staff was given training in execution and adoption of wellness policies to improve nutrition and physical activity.³⁹ A pre and post intervention observation day for each center was used to assess change.³⁹

Another study examined the effectiveness of an intervention consisting of a worksite wellness program that increased staff self-efficacy as a means to facilitate change in the nutrition and physical activity of CCCs.⁴¹ Gosliner et al. reported an increase in nutrient dense foods served for meals, snacks and celebrations in intervention sites, whereas control sites reported an increase in sweetened foods and beverages served at celebrations.⁴¹ These studies exhibit the need for well-developed instruments for measuring CCCs environments, and interventions to facilitate change in nutrition and physical activity environments. There are no published studies where visual feedback on the CCC environment was provided to centers or studies that have facilitated changes in CCCs through this type of feedback.

These studies and tools present an excellent launching point for to guide the creation of new tools for measurement of environments, with the goal of developing more thorough measures. Based on methods of previous studies, the researchers of the present study have developed a tool called the Childcare Environmental Assessment Tool (CCEAT) to measure the food and physical activity environments in CCCs. This tool, illustrated in Table 1.1, examines shelf space, the presence of fruits, vegetables, milks, sugars and sweetened beverages, general kitchen space, meal time observations including modeling behaviors of childcare staff, screen presence and use, nutrition and physical

activity signage in classrooms, water availability, inside and outside play space and equipment, and designated breastfeeding areas.

Table 1.1: CCEAT Variable Examples Observed

Area Observed	Specific Variables Observed	Policies collected related to:
Kitchen	Fruits	Foods kept
	Vegetables	Foods brought in
	Sugar sweetened beverages	Foods served
	General space (including: capacity for scratch cooking, capacity for food storage)	Juice – type, amount
	Discretionary calories	Milk – type, amount
Mealtime Observation	Style of service	Seconds
	Modeling behaviors	Modeling behaviors
	Seconds consumed by children	Feeding style
	Environmental barriers	Staff sitting with children
	General eating area	Use of food as punishment
	Foods served	Parents eating with children
Classrooms	Nutrition & physical activity signage	Activities posted
	Food in classroom	Water
	Water in classroom	Food in classroom
	Space available for play	Screen time
	Activities schedule posted	
General Shared Spaces	Policies posted	Menu posted
	Parent food sign-up sheet	Sign-up sheets
	Rules posted	Posted policies
	Daily activities posted	Posted rules
	Informational pamphlets available	Breastfeeding
	Menu posted	

Policy

Nutrition practices and policies play an important role in environmental factors that influence children's healthy behaviors in the childcare setting.⁴² Policies can be implemented for all aspects of the CCC environment such as a required daily amount of time for physical activity, modeling behaviors of staff, and signage present where children eat and play. Clear standards that are outlined in formal written policies are considered to be an effective management tool for promotion of healthy environments, behaviors, and role modeling.⁴² Successfully written and enforced policies that result in environmental change and lead to behavioral change are an effective way to reduce the prevalence of childhood obesity.⁴³ Therefore, with the application of well-defined policies and enforceable rules, there is great potential for changing the environment in CCCs to contribute to healthy behaviors, nutritional intake, and daily physical activity.

Policies can be tools to modify current norms and attitudes while providing the support and resources needed to establish a healthy environment.⁴⁴ An area for potential policy implementation is limiting or eliminating food that is brought into CCCs. Food consumed in the CCC includes food provided by the center, foods that are prepared and brought from home, or a combination of both. A possible positive approach in the promotion of a healthy environment is to have policies written and implemented that specifically state what cannot be brought into the center by parents and staff, as well as what foods the center will provide.

Modeling behaviors are another good approach for policy implementation. Erinoshio et al. examined nutrition policies in CCCs and their impact on caregiver behavior modeling. Results showed that less than half of studied centers had a written

policy regarding modeling of staff eating behaviors, and less than half had a written policy regarding food brought in by staff. Also, modeling of healthy behaviors by staff occurred more frequently at centers with written policies promoting staff modeling, informal talks during meal time about nutrition, and discouragement of unhealthy foods.⁴²

All CCCs that participated in the present study are licensed by the Texas Department of Family and Protective Services (DFPS). Some CCCs participate in the CACFP, and some are National Association for the Education of Young Children (NAEYC) accredited.⁴⁵⁻⁴⁷ Policies required for these three entities related to food environments can be found in Table 1.2. As indicated in the table, policies exist for posting of activity lesson plans and menus, having a choke hazard-free environment, appropriate height of furniture, water availability, and a place for moms to breastfeed. However, these agencies do not require policies that support an environment for healthy food and physical activity. Policies are important and necessary in the establishment of healthful environments, and are currently lacking in CCC licensing agencies.

Table 1.2. Childcare Licensing Agencies and Relevant Policies			
Policy	Department of Family and Protective Services (DFPS)	Child and Adult Care Food Program (CACFP)	National Association for the Education of Young Children (NAEYC)
Activity lesson plan posted	X	X	
Daily menu posted	X	X	X
Infant feeding instructions	X	X	
Ratio of children to caregivers	X	X	
Limit screen time	X	X	
Choking hazard free environment	X	X	X
Age appropriate seating and tables	X	X	X
Specified frequency of food offered	X	X	
Morning and afternoon outdoor play time	X	X	
Water available to children at all times	X	X	X
Provide opportunities and materials to children that encourage good health practices			X
Water served with snack, mealtime, after active play	X	X	
Children are provided varied opportunities and materials to help them learn about nutrition	X	X	
Adults must sit with children during mealtime and engage them in conversation			X
Support breastfeeding by providing a comfortable place	X	X	X
No more than 4oz juice per child daily	X	X	X
No cow's milk to infants younger than 12 months			X
Limit television to developmental appropriate programming			X
Food groups for meals and snacks specified		X	

Comprehensive Approach

Best Food for Families, Infants, and Toddlers (Best Food FITS) is a research initiative aimed at reducing childhood obesity risk through comprehensive community approaches to improving the health of children. Best Food FITS initiatives focus on increasing child intake of fruits and vegetables and reducing their intake of sugar sweetened beverages by modifying the food environment. The projects' most current research initiative is the Best Food FITS – CCCs (Best Food FITS – CCC) which has been developed to combat childhood obesity in CCCs. The development of this initiative was guided by theoretical concepts of the social cognitive theory (SCT): reciprocal determinism, behavioral capability, expectations, self-efficacy, observational learning, reinforcements within the workings of the social-ecological framework.^{48,49}

Best Food FITS – CCC also takes an ecological approach, examining the interrelations among policy, environments and individual factors and how these relationships can affect healthy behaviors within CCCs. Within a CCC, there are multiple levels of influences on behavior that are related to intrapersonal, interpersonal, organizational, community, physical environment and policy.⁴⁹ The Best Food FITS – CCC study aims to develop an intervention at all levels in CCCs in which behavior is affected, including policy, environments, and individuals. Through this approach the intervention strategy is strengthened. Best Food FITS – CCC Theoretical Framework Model exhibits the incorporation of all aspects in this study (See Figure 1.1).

Within this approach, the capacity exists for multiple levels to work with children, families, and childcare staff. The research team is able to approach the childcare setting as a whole with policies, and within the center by modifying physical and social

environments. Additionally, the approach can target individual levels by improving knowledge, attitudes, beliefs, and practices of workers in the CCC.

Further investigating the spheres of influence in the childcare environments through the social cognitive theory emphasizes the importance of environmental and social components that influence factors that are potential risks for obesity.⁴⁸ The present study design aims to provide care-givers with behavioral and cognitive skills to facilitate change in their environment and to bolster self-efficacy to implement change (See Figure 1.1). With changes and adjustments to the environment and policies that affect the environment, there is an opportunity to promote healthy behavioral change as CCC workers themselves adopt new and healthier behaviors.

Throughout the intervention, CCC staff were provided the opportunity to study and practice mock policy and environmental change related to their food and physical activity environments. CCCs were given information about different levels of policy implementation, potential responses from staff, parents, and children, and ways to combat barriers during the intervention. This gave them insight into what they might expect from potential changes and provided increased self-efficacy to make these changes. Finally, technical support reinforcements were provided to encourage change and improvement.

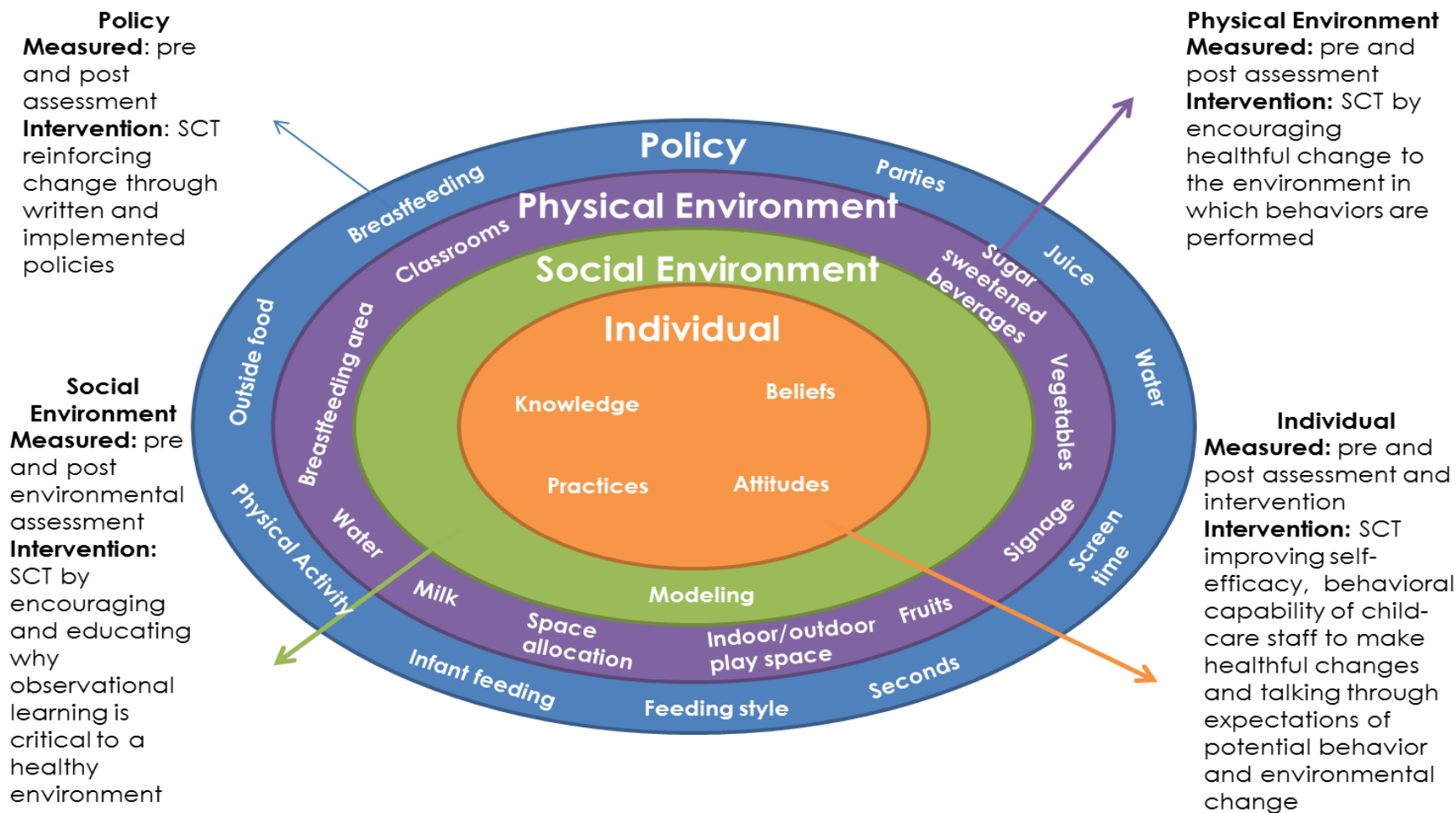


Fig. 1.1 Best Food FITS! – CCC Environmental and Policy Theoretical Framework Model. This model examines spheres of influences on child-care centers by measures conducted and a workshop intervention. Using guidance of an ecological framework in conjunction with the Social Cognitive Theory (SCT).

Similar theoretical frameworks can be found to successfully guide implementation of change. Gortmaker et al. developed a multicomponent intervention for obesity reduction in boys and girls in grades six through eight for two years with guidance of the SCT.⁵⁰ This study was developed to enable change through providing cognitive and behavioral skills. This was achieved by providing informative and skill building sessions by teachers with students. These sessions focused on reducing students' consumption of high-fat foods, increasing physical activity, increasing intake of fruits and vegetables, and reducing their screen time. Findings included a reduction in obesity prevalence and increased consumption of fruits and vegetables among girls, and both boys and girls reduced television viewing. These results indicate that with theoretical guidance, a comprehensive study is a promising approach to reduce obesity prevalence.⁵⁰ The concepts of self-efficacy used by Gortmaker et al. to empower teachers with the tools to educate children on the importance of healthy behaviors supports the present study's intervention approach. In the present study's intervention, child care-givers were educated as to the importance of healthy behaviors. These behaviors have the potential to encourage a healthy environment. Therefore, this intervention aimed to facilitate the development of self-efficacy in the childcare staff to make the necessary environmental changes.

Lynch et al. examined an ecological approach to determine factors influencing childcare providers' food and mealtime decisions.⁵¹ Using theory as a guide, researchers conducted semi-structured interviews with licensed childcare providers. Through analysis, researchers identified themes regarding all levels of the social ecological theory as influences for mealtime decisions. Within the individual level, convenience and ease

of making mealtime run smoothly, attitudes, beliefs, knowledge, self-efficacy, and interactions with parents and children all contributed to mealtime decisions. At the community level, results showed the availability, price, and quality of food, connections with other childcare providers, internet community support, and community resources affected mealtime decisions. Finally, at the level of society, nutrition information resources, and overconsumption of junk foods contributed to meal time decisions. With the use of the social ecological framework researchers were able to thematically determine behavior and the variety of factors involved in childcare provider's mealtime decisions and foods offered.⁵¹ The concept of spheres of influences of behaviors for mealtime decisions represented by Lynch et al. lends to the current study's use of measuring the environment and affecting behavioral change at all levels of influence.

The empowerment of childcare caregivers is an important component to combat child obesity. In this study, we attempted to empower CCC staff by engaging them in the development and implementation of approaches to provide a healthy environment, including policies that support these approaches.⁵² Outcomes were assessed by examining all levels of change in the SCT.

Specific Aims

Our long term goal is to understand and improve upon preventative influencers of childhood obesity in CCCs. The specific objective of this proposal is to measure changes in the environment and assess policy changes. The central hypothesis of the proposed study is that an intervention for CCC staff and technical assistance to the CCC will improve policies and factors of the food environment. The rationale for the proposed research is CCC staff will make changes upon becoming aware of their environment, and

the role that policies can play in facilitation of a healthy food environment. This study was pursued through three Specific Aims:

1. Policy change was examined by collecting CCC policies from pre and post assessments and scoring these collected policies.

Our working hypothesis for Aim 1 is that policies collected post intervention will receive a higher score than policies collected pre intervention.

2. Food environment change was assessed by the presence of specific items found on the CCEAT.

Our working hypothesis Aim 2 is that more space will be available for nutrient dense foods, and fewer negative images will be present post-intervention.

3. Food environment change was assessed by CCEAT scoring pre and post intervention.

Our working hypothesis for Aim 3 is that CCEAT scores will be higher post intervention than pre intervention.

The proposed work is innovative because it capitalizes on the use of trained data collectors at all points of the study. We also provided direct visual feedback to CCC staff at the intervention workshop to facilitate change. At the completion of this project, we expect that the combined work proposed in Aims 1, 2, and 3 will show changes in the food environment and policies of CCCs and will give better insight into influencers of childhood obesity in the studied areas.

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CHAPTER II: METHODS

Design

This study includes analysis of data collected on CCC environments and policies as part of the Best Food FITS - CCC study. The research team collected a convenience sample by calling all licensed CCCs in Hays and Bastrop counties, Texas. In order to reach saturation in data collection, researchers aimed for a maximum of 40 CCCs. The present study was modeled after a previous study by Ward et al.¹ All researchers involved in this study were trained on the CCEAT and were certified to conduct human research through Collaborative Institutional Training Initiative. This study was approved by the Texas State University Institutional Review Board (IRB). Spanish speaking researchers were available at all times during recruitment and subsequent phases of the study.

Best Food FITS - CCC

Best Food FITS – CCC began in the spring of 2013 with recruitment of CCCs in Hays and Bastrop counties. A team of two researchers visited all participating CCCs between February and April of 2013 to complete the first environmental assessment. During the first site visit, a CCC director was interviewed and each CCC employee was asked to complete the first in a series of three surveys. In April 2013, the study intervention was conducted. This intervention workshop included a series of lectures and interactive activities regarding childhood obesity, nutrition, physical activity, environment, and policies. Intervention attendees also participated in focus groups to discuss topics related to workshop lectures in relation to their experience at CCCs.

Participants at the end of the intervention completed the second survey and set specific goals for changes to make in their CCC environments. Over the four months (May – August) following the intervention, trained researchers called the centers each month in order to provide technical assistance to CCC staff. The technical assistance was developed to help participants with achieving specific goals established at the intervention workshop. In fall of 2013, the centers were visited once more to complete the second environmental assessment, and CCC staff completed survey three thereafter. Finally, verification calls were made to all centers November 2013-January 2014. During verification calls, an auditor reviewed changes between CCEAT1 and CCEAT2 by phone to verify that changes had been made. Directors were asked if they were aware of the changes, if there was a policy implemented for the change, as well as other changes that were potentially made. An overview of the timing of events occurring during the study is illustrated in Figure 2.

Recruitment

DFPS licensed CCCs in Hays County (zip codes: 78666, 78667, and 78640) and Bastrop County (zip code: 78602) were recruited between January and March 2013 to participate in this study. The inclusion criteria for CCCs were: 1) licensed by the state of Texas; 2) provided one of the following: breakfast, snack, lunch; and 3) located in participating zip codes. Sites that were not able to attend the workshop were given the option to participate in the study as control centers. Control sites participated in the initial and second assessment, but did not attend the intervention workshop, nor was any additional support provided throughout the duration of the study.

CCCs were contacted via phone by researchers using a call script. Each center was called until a member of the research team was able to thoroughly discuss the study with the director, resulting in participation or nonparticipation. The director was provided with an explanation of the participating study requirements. This included availability to partake in an interview during the first on-site visit, access to all areas of the childcare for pre and post environmental assessments, participation from all staff and the director to complete all surveys, collection of policies and menus, and attendance at the free intervention workshop in April 2013. As incentive for participating, each center was promised a \$25.00 HEB grocery store gift card per completion of each component of the study, as well as 5 hours of continuing education credits for participation in the workshop. The research team scheduled a date for the first on-site visit once a center director expressed interest in participating. Recruitment was finalized once participants consented to participate in the study.

Observation Instrument

For data collection, the research team used the Childcare Environmental Assessment Tool (CCEAT) (Shown in Appendix A). This tool was developed using tools found in the literature, and through previous collaborative research efforts.^{1,2}

The CCEAT was developed with a thorough review of literature pertaining to recommendations, standards, nutrition, physical activity, and food environments of CCCs, and through input by a team of researchers with the purpose of obtaining observational data on participating CCCs. Following the development of CCEAT, the director of the Texas State University CCC reviewed the tool and was given the opportunity to provide feedback.

This tool was used twice during this multi-component study to assess the food and physical activity environments in each participating CCC. The tool is divided into the following sections: kitchen, meal or snack time, infant classroom, toddler classroom, pre-k classroom, entryway/hallway/shared spaces, breastfeeding area, indoor play area, and outdoor play area. Table 2.1 gives specific examples of items observed and policies collected. Only one classroom from each age range was assessed.

The time to complete the CCEAT was approximately two to three hours. Each researcher on the two member research team independently completed a CCEAT during each site visit. Accompanying the written assessment, researchers took photographs of environmental facilitators and barriers observed in the CCC.

Table 2.1: CCEAT Variable Examples Observed

Area Observed	Specific Variables Observed	Policies collected related to:
Kitchen	Fruits	Foods kept
	Vegetables	Foods brought in
	Sugar sweetened beverages	Foods served
	General space (including: capacity for scratch cooking, capacity for food storage)	Juice – type, amount Milk – type, amount
	Discretionary calories	
Mealtime Observation	Style of service	Seconds
	Modeling behaviors	Modeling behaviors
	Seconds consumed by children	Feeding style
	Environmental barriers	Staff sitting with children
	General eating area	Use of food as punishment
	Foods served	Parents eating with children
Classrooms	Nutrition & physical activity signage	Activities posted
	Food in classroom	Water
	Water in classroom	Food in classroom
	Space available for play	Screen time
	Activities schedule posted	
General Shared Spaces	Policies posted	Menu posted
	Parent food sign-up sheet	Sign-up sheets
	Rules posted	Posted policies
	Daily activities posted	Posted rules
	Informational pamphlets available	Breastfeeding
	Menu posted	

Observer Training

Because the researchers lacked experience working in a CCC, three lead researchers along with the Primary Investigator (PI), and two Co-Investigators were trained during a one day training session. Training consisted of a thorough review of the CCEAT and its components. The study's PI trained the lead researchers by demonstrating proper observational techniques, review and explanation of the tool, use of photography to further describe findings, and guidance regarding proper record keeping techniques.

Following the training, all investigators and lead researchers held a practice data collection session at the Texas State University CCC. During the practice, the research team observed children's mealtime and completed the CCEAT. Areas of observation in the CCC included: breastfeeding area, classrooms, kitchen, outdoor and indoor plays areas, and general shared spaces/entryway. Once the practice study was completed, the research team reconvened to refine the tool for clarity and ease of use. Assistant researchers were then trained on use of the CCEAT by lead researchers. Training included practice using the tool and guidelines of use, record keeping, and use of photography to facilitate an understanding of facilitators and barriers in each CCC.

Data Collection

Pre-environmental Assessment

For the initial assessment of CCCs, a team of two researchers went to the participating CCCs to perform the first environmental assessment. The goal of this environmental assessment was to gather information about facilitators and barriers to a healthy environment. Each environmental assessment included: 1) direct observation of the facility; 2) completion of the CCEAT to record facilitators and barriers, as well as

pictures taken to further describe facilitators and barriers; and 3) collection of policies from the CCC director.

Intervention

The study intervention was in the form of a five hour workshop. The research team held a free workshop for all participating CCC workers. The CCC staff was provided presentations explaining the importance of child nutrition, physical activity, environment and policies. The environment and policy presentation explained the importance of a healthy environment, improvement in nutritional knowledge, attitudes, beliefs, and practices of CCC workers.

During the environment and policy presentation, the research team provided CCC workers with a picture feedback and policy activity. The picture activity included pictures taken at their site during the initial site assessment. The pictures were attached to a document where they were able to describe facilitators and barriers of a healthy environment. Once this picture activity was completed and collected, the research team provided the site with written comments pertaining to facilitators and barriers directly observed from pictures taken during the initial site visit. The policy activity included an example of a policy matrix illustrated in Table 2.2, which was provided to CCC workers to demonstrate four levels of potential policy change.

Table 2.2. Workshop Policy Matrix Example**Problem statement: Cupcakes for every child's birthday.**

Program/Policy	Benefit	Cost	Impact/ Reach to children	Objections
1. No outside food at all.	Complete control Eliminate outside high sugar/ high fat foods	Increased food production and supply costs to center	Most control. All days, all people, all foods.	My child will not eat what the ccc provides.
2. Two celebrations per year with specified foods.	Complete control	Meal costs remain neutral. No cost increase	Good amount of control. Some parent wiggle room.	My child should be allowed to have celebratory foods at school with friends on his/her birthday.
3. Celebration with a specific list of foods.	Control of special foods while allowing	No cost increase	Some control over foods brought in.	My child should be allowed to have cupcakes and birthday cake on his/her birthday.
4. Parents may bring in any food they want on specific dates.	No control Complete parental freedom	No cost increase	No impact or reach.	My child should not be fed cupcakes 20 times a year at school for classmate birthday parties.

Technical Support

Following the workshop, a team of researchers provided technical support for the CCCs through email and phone calls. During follow-up calls, each researcher, using a script, contacted the CCC director to inquire about: 1) completion of goals set during the workshop; 2) environmental and policy changes made; and 3) additional support or materials needed. Since many directors cited the need for additional policy information, the research team provided handouts, which included ideas for policy and environmental changes.

During each month of the support phase, specific topics were discussed with the directors. In May, centers were contacted via email to inquire if they needed additional help with implementing goals that they established during the workshop. In June, centers were contacted by phone and asked specifically about progress towards goals set during the workshop. In July, centers were contacted by phone and asked specifically about environment and policy changes made, as well as their goals established during the workshop. In August, centers were emailed a policy guide and suggestions for environmental change; they were then contacted by phone and asked about any changes made.

Post Intervention Assessment

Post intervention assessments were completed in the fall of 2013, which provided adequate time for participating centers to implement policy and environmental change. The research team traveled to each CCC for completion of the second CCEAT to assess change. Initial assessments were reviewed to insure that each site had similar room assessments. Following this final step of data collection, all policy and environmental findings were compared to provide information for verification calls.

Verification Calls

After the post intervention assessment, observed changes from initial to second assessment in each CCC were noted to examine confirmation validity of the CCEAT. Once changes were assessed, a report was compiled. An auditor called the center to discuss the report with the director. The auditor reviewed an itemized list of all changes with the centers' directors and inquired about information on awareness and facilitation

of the changes. The purpose of this audit was to verify observed changes and to describe researcher observed influences of change.

Reliability & Validity

Data collector agreement known as inter-rater reliability was calculated for CCEAT1 and the CCEAT2. To calculate percent agreement, researchers created a matrix in which each variable of the CCEAT was listed. A code of 1 was given for each variable that was agreed upon by both researchers. When there was disagreement between the two researchers a 0 was given. Variable scores were then added together and divided by the total number of variables possible for agreement. This number was multiplied by 100 to obtain *percent agreement*.

Validation of CCEAT was conducted upon completion of the second assessment. Pre- and post-CCEAT responses by researchers were examined to ensure similar responses. In the event of significant change CCCs were contacted for discussion to ensure quality of the data collection.

Scoring of CCEAT

A scoring method was developed by the research team to further analyze change between CCEAT1 and CCEAT2. Each section of the CCEAT was scored with a positive or negative score for each existing variable. For example, a positive score was given for having a variety of fruits and vegetables, and a negative score was given for foods containing discretionary calories. The full scoring tool can be found in the Appendix x. Three independent coders scored CCEAT1 and CCEAT2. The lead researcher then reconciled the coding. Once coding was reconciled to compare before and after

intervention results, independent samples t-tests were run in SPSS to compare the before and after results between the two independent groups (intervention and control).

Scoring of Policies

Scoring of each participating CCCs policy book was determined using a rubric created by the research team. A member of the research team independently read through the policy handbook, searched for the items on the rubric, copied and pasted the language that was found in the handbook and calculated the total score. A second and third member of the research team followed the same process. The three rubrics were then compared and adjusted for errors. The policy scoring system developed to measure the quality of policies present in participating CCCs was based on the following system: 1) 0 = no mention of the item topic; 2) 1 = the topic was mentioned within a recommendation or with vague language; 3) 2 = if the topic was addressed in a specific and distinctive manner; 4) 3 = if the topic was addressed in a specific and distinctive manner and carryout language was present.

Data Analysis

Measures in this study were objective in nature, and bias was reduced with trained researchers completing each phase of the study. Observer bias was diminished with a protocol set in place of two independent observers completing the CCEAT and taking pictures to further describe observations. SPSS version 20 was used to compare before and after intervention results, for CCEAT variables, CCEAT scores and policy scores paired samples t-tests were run when data was normally distributed and Wilcoxon signed rank was run when data was not normally distributed.

To remove the extraneous influences from the dependent variables of post CCEAT scores, covariates of education of teachers, served lunch (yes or no), size of CCC, number of hired teachers were examined through analysis of covariance (ANCOVA). Covariates that have the ability to bias the results, outside of the control of the researchers, were examined. This analysis minimizes design problems related to non-random assignment to groups while statistically controlling for the effects of covariates.

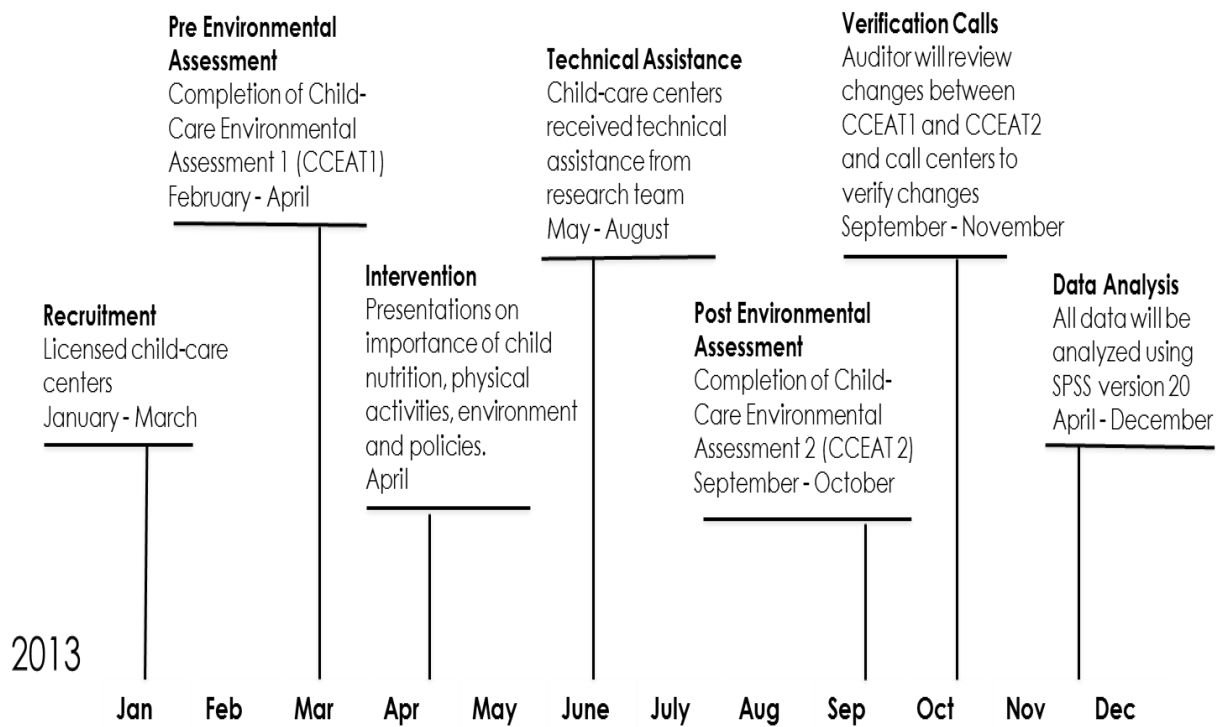


Figure 2.1. Best Food for Families, Infants and Toddlers–Child Care Centers Study Timeline

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CHAPTER III: MANUSCRIPT

Introduction

Childhood obesity has reached an epidemic level. According to the 2011-2012 National Health and Nutrition Examination Survey (NHANES) data, 16.9% of children ages 2 to 19 are obese.¹ The two primary lifestyle contributors to childhood obesity are unhealthy diet and lack of physical activity.² These two risk factors can be modified by reducing exposure to foods of minimal nutritional value and decreasing sedentary behaviors such as screen time.² Additionally, The importance of modifying social norms and behaviors through healthy and active environments, in conjunction with implementation of policies that impact the environment for nutrition and physical activity.²

The risk of obesity is increased with poor diet, socio-economic status, and ethnicity. Consumption of fruits and vegetables has a preventative effect on childhood obesity.^{3,4} According to secondary analysis of NHANES data, instead of meeting fruit and vegetable recommendations, children consume too many calories from solid fats, added sugars, and refined grains.^{5,6} Lower socio-economic status children experience higher rates of overweight and obese.⁸ Adolescents of families that fall below 130% of the federal poverty level threshold are two times more likely to become overweight, when compared to adolescents from families above the same poverty level.⁹ The disparities in obesity prevalence among U.S. children and adolescents of different ethnic and racial backgrounds are substantial.¹⁰ Hispanic boys 2-19 years of age are at a higher risk for becoming obese, compared to non-Hispanic white boys of the same ages.¹⁰

The number of overweight and obese children varies by state and region. Data from the Centers for Disease Control and Prevention shows that 15.3% of children in Texas are obese¹¹ FITNESSGRAM® data shows in the south central Texas area 31%-39% of school age children are at high risk for developing metabolic syndrome.¹² These numbers illustrate an urgent need for local interventions that target risk factors and root causes of childhood obesity.² It is critical to address the areas that are of greater need, due to the magnified effects of low income and minority populations.

Intervening early in childhood is critical due to the influence a child's weight status has on their weight status as an adult.¹³ Strategic interventions for the reduction and prevention of early childhood obesity are required to help prevent health consequences. Such consequences include, but are not limited to: social rejection, low self-esteem, asthma, early onset of adult diseases including asthma, type 2 diabetes, joint and bone disorders, and sleep disturbance. As a result, these consequences result in significant increases in health care costs.^{14,15} The childcare setting provides an ideal setting to develop needed multi-component interventions for prevention of obesity in children and the opportunity to reach large numbers of children, their families, and even the childcare workers themselves.¹⁶

Childcare settings provide an opportunity to introduce children to healthy foods, activities, modeling of healthy behaviors and exposure to positive food environments. More than half of all children in the United States under the age of 6 are in center-based care arrangements.¹⁷ On average, children who attend childcare centers spend approximately 22.5 hours during the week in this setting, consuming a number of their meals and snacks, and obtaining much of their weekly physical activity.^{18,19} Childcare

centers are one of the places where children learn eating habits and food preferences. Therefore, it is crucial to examine avenues to provide healthful food environments and environments that are conducive to physical activity in childcare centers.

Improving childcare provider's knowledge regarding the potential to impact childhood obesity in their environment, empowers them to facilitate change.²⁰ A change in behavior is an –important component to the process of preventing and treating obesity; however, this alone is not enough.²¹ Research has demonstrated that when healthy food is available and accessible in the food environment, overall dietary intake is improved.²² Reducing obesity in children must use an approach that includes community-level factors of built, social, and natural environments to be successful.²¹ Environmental interventions can empower children by facilitating healthy behaviors and habits.²³ Childcare center environments have the opportunity to provide a setting that encourages, promotes, and influences healthy behaviors through modeling by childcare providers.

Determining healthy environmental facilitators and barriers could provide an opportunity and avenue for obesity prevention. Understanding the specifics of what comprises a healthy environment for children is a topic that continues to be explored in many areas, including the design of communities, retail food environments, and neighborhood food environments. There are many ways to improve the environment in which we live, including improving community infrastructure, social institutions, the food environment in general, and our own homes. There are a number of studies which have examined, measured and developed environmental interventions, and several tools have been developed to access a range of different environments.^{18,24,25}

System for Observing Play and Recreation in Communities (SOPARC) was developed by McKenzie, Cohen, Sehgal, and colleagues to measure activity and associated variables of physical activity in community parks including accessibility, usability and equipment. It was determined that children living in safe areas with access to recreational parks participate in more physical activity, and therefore these children were observed to have better weight management.²⁶

System for Observing Play and Leisure Activity in Youth (SOPLAY), developed by McKenzie, was designed to obtain observational data on the numbers of students and their physical activity levels during play and leisure opportunities in a specified activity area. Researchers determined environmental strategies and policies are needed to improve participation in physical activity among adolescents.²⁷ Environmental observations allow for a greater depth of understanding of the nutrition environment facilitators and barriers.

Saelens, Glanz, Sallis and colleagues developed a tool to assess factors believed to contribute to food choices in restaurants called the Nutrition Environment Measures Study in Restaurants (NEMS-R).²⁸ This tool was designed to measure the environments of sit-down and fast-food restaurants assessing factors including: availability of more foods, facilitators and barriers to healthful eating, signage/promotion of healthy and unhealthy foods. These researchers also developed a tool to measure nutrition environments in retail food stores called the Nutrition Environment Measures Survey in Stores (NEMS-S).²⁵ This tool is used to assess availability of healthy options, prices and quality. NEMS-S findings indicated that children who have greater access to convenience stores that contain very few healthy, low energy dense foods, as opposed to children who

have access to grocery stores that contain large amounts of healthy, low energy dense foods have a much more difficult time maintaining a healthy diet.²⁶

These studies assessed a variety of environments, and the assessment tools have allowed for development of tools to assess the built environment of childcare centers. Even with the tools that presently exist there is still a need for reliable, valid tools to measure environments.^{2,25}

Oreskovic et al. assessed the built environment along with children's weight, observing differences and similarities in communities with high and low incomes to determine if energy intake or expenditure differed within various populations.²⁴ This study found a positive association between low-income towns in which children lived, and a built environment that fostered high energy intake with few places for energy expenditure.²⁴ Childcare centers with an outdoor environment with open play areas, tend to have children with higher levels of physical activity than centers that do not have an encouraging outdoor play environment.²⁹

Ward et al. developed an environmental instrument called the Environment and Policy Assessment and Observation tool (EPAO) to assess the environment of childcare centers in North Carolina.¹⁸ This tool was used during a one-day assessment of 82 participating childcare centers in North Carolina. Observations during the assessment included interactions between staff and children during meal time, food and beverages that were served to the children, physical activity and nutrition environment, in addition to staff support for physical activity and nutrition.¹⁸ Results indicated intervention centers did not have a significant increase in EPAO scores compared to control centers.³⁰

These studies and tools present a great launching point for creation of new tools for measurement of environments, with the goal of developing more thorough measures. To the researcher's knowledge, the EPAO is the only other instrument that has been developed to assess the environments of childcare centers. Based on methods of previous studies, the researchers of the present study have developed a tool called the Childcare Environmental Assessment Tool (CCEAT) to measure the food and physical activity environments in childcare centers. This tool, shown in Appendix A, examines the presence of fruits, vegetables, discretionary calories, sweetened beverages, general kitchen space, meal time observations including modeling behaviors of childcare staff, screen presence and use, nutrition and physical activity signage in classrooms, and water availability.

Best Food for Families, Infants and Toddlers (Best Food FITS) is a research initiative aimed at reducing childhood obesity risk through comprehensive community approaches to improving the health of children. The project's most current research initiative is the Best Food FITS-Childcare Centers (Best Food FITS – CCC) which was developed to combat childhood obesity in childcare centers. The development of this initiative was guided by theoretical concepts of the social cognitive theory (SCT): reciprocal determinism, behavioral capability, expectations, self-efficacy, observational learning and reinforcements within the workings of the social-ecological framework.^{31,32} Best Food FITS – CCC also takes an ecological approach, examining the interrelations among policy, environments and individual factors and how these relationships can affect healthy behaviors within the childcare centers. Within a childcare center, there are multiple levels of influences on behavior that are related to intrapersonal, interpersonal,

organizational, community, physical environment and policy.³² The Best Food FITS – CCC study aims to develop an intervention at all levels in childcare centers in which behavior is affected, including policy, environments and individuals. The intervention strategy is strengthened through this approach. Best Food FITS – CCC Theoretical Framework Model exhibits the incorporation of all aspects in this study. (See Figure 3.1)

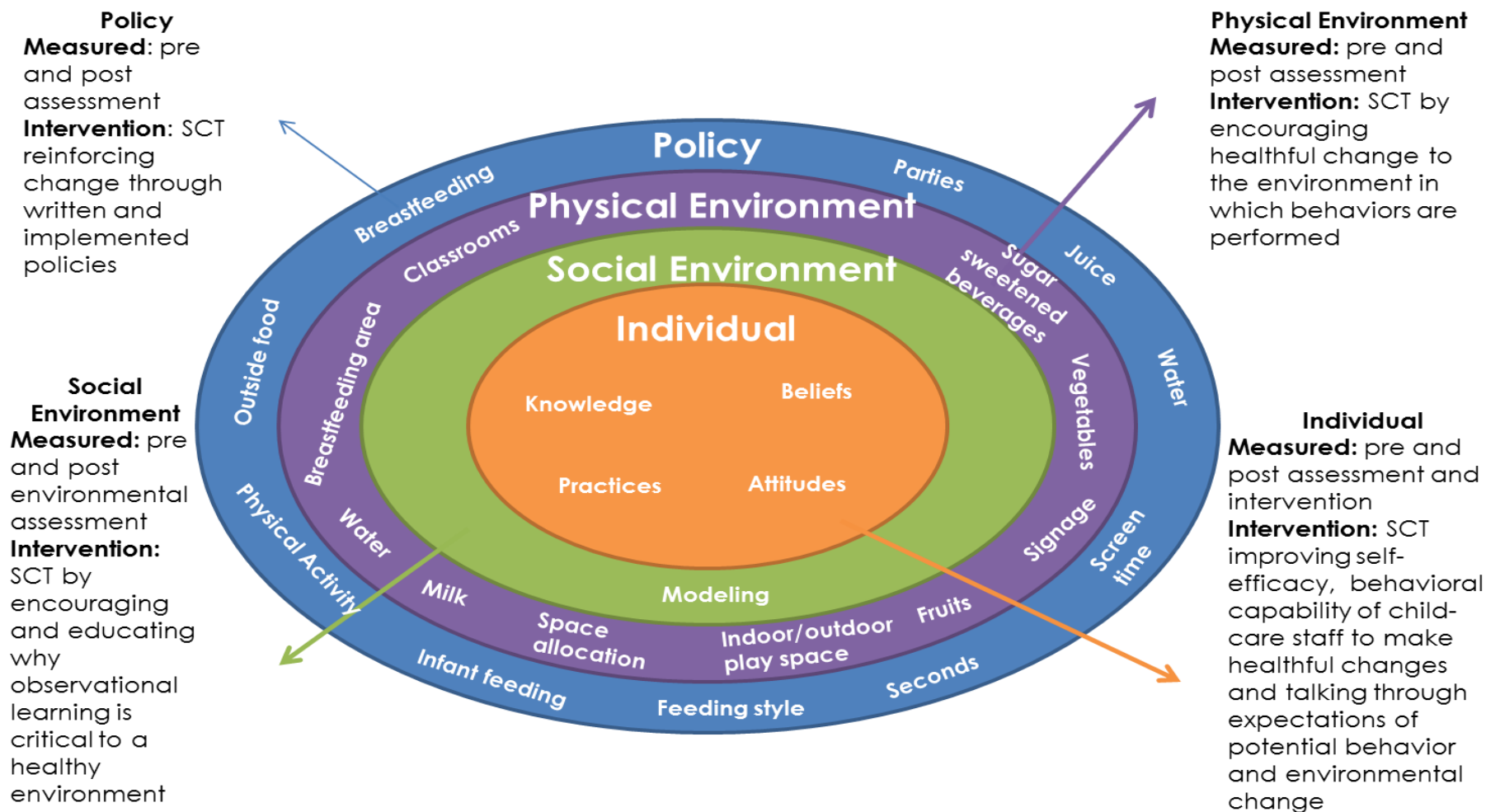


Fig. 3.1 Best Food FITS! – CCC Environmental and Policy Theoretical Framework Model. This model examines spheres of influences on child-care centers by measures conducted and a workshop intervention. Using guidance of an ecological framework in conjunction with the Social Cognitive Theory (SCT).

In this study we aim to understand and improve upon preventative influencers of childhood obesity in childcare centers. The central hypothesis of this study is that an educational intervention for childcare center staff and technical assistance to facilitate change within the childcare center will improve policies and factors of the food environment of the childcare center; such as, fruit and vegetable presence, meal time encouragement, and health promotion messaging in classrooms. The rationale for this line of research is that upon providing training to staff and technical support to childcare center administrators, the culture and nutrition environment of childcare centers will improve to support improved nutrition and education to students enrolled in the childcare center. We will examine the nutrition environment and policies of childcare centers pre- and post- a staff training intervention.

Methods

Study Design

This study includes analysis of data collected on childcare center environments and policies as part of the Best Food FITS-CCC study. The present study incorporated components of a previous NAP SAC study by Ward et al. and expanded to include visual feedback during the intervention.³⁰ All researchers involved in this study were trained on the CCEAT and were certified to conduct human research through the Collaborative Institutional Training Initiative. This study was approved by Texas State University – Institutional Review Board (IRB). Spanish speaking researchers were available at all times during recruitment and for all phases of the study.

Best Food FITS – CCC began in the spring of 2013 with recruitment of childcare centers in Hays and Bastrop counties in south-central Texas. A team of two researchers

visited all participating childcare centers between February and April 2013 to complete the first environmental assessment. In April 2013, the study intervention was conducted. This intervention was delivered in the form of a workshop which included a series of lectures and interactive activities regarding childhood obesity, nutrition, physical activity, the food environment, and policies impacting nutrition and the food environment. In the fall of 2013, the centers were visited once more to complete the second environmental assessment. Finally, verification calls were made to all centers November 2013-January 2014. During verification phone calls, an auditor reviewed and verified changes between CCEAT1 and CCEAT2. Directors were asked if they were aware of the changes, if there was a policy implemented for the change, and if there were any other changes made.

Participants and Recruitment

Childcare centers licensed by the Texas Department of Family and Protective Services (DFPS) in Hays County were recruited January-March 2013. The research team collected a convenience sample by calling all licensed childcare centers in Hays and Bastrop counties. Researchers aimed for a maximum of 40 childcare centers and sampled until saturation of unique CCC characteristics was reached. The inclusion criteria for childcare centers were: 1) licensed by the state of Texas; 2) provided one of the following: breakfast, snack, or lunch; and 3) located in participating zip codes. Sites that were not able to attend the workshop were given the option to participate in the study as control centers. Control sites participated in the initial and second assessment, but did not attend the intervention workshop nor was additional support provided throughout the duration of the study. Control centers were included in this study to determine if the

intervention workshop was effective in facilitating change, or if the mere presence of researchers produced change.

The directors of the childcare centers were contacted via phone by researchers using a call script. Directors interested in participation were provided with an explanation of the study requirements. As incentive for participating, each center received a \$25.00 grocery store gift card per completion of each component of the study, as well as 5 hours of continuing education credits for each childcare worker who participated in the workshop. Recruitment was finalized once participants consented to participate in the study.

Measures

For data collection, the research team used the CCEAT (shown in Appendix A), which was developed using tools found in the literature pertaining to recommendations standards, nutrition, physical activity, and food environments of childcare centers, and through previous collaborative research efforts.^{18,33} In addition, the team of researchers provided additional input to the development, with the purpose of obtaining observational data on participating childcare centers. The tool was modified as needed once training was complete and used twice during this multi-component study to assess the food environments in each participating childcare center.

The tool was divided into the following sections: kitchen, meal or snack time, infant classroom, toddler classroom, pre-k classroom, and entryway/hallway/shared spaces. The CCEAT, shown in Table 3.1, illustrates specific examples of items observed and policies collected and themes found in CCCs. Only one classroom from each age range was accessed. Therefore, centers with more than one classroom per age group only

had one classroom selected for assessment. The average time to complete the CCEAT was approximately 2-3 hours. Each researcher on the two member research team independently completed a CCEAT during each site visit.

Table 3.1: CCEAT Variable Examples Observed and Common Themes Found in CCC

Area Observed	Specific Variables Observed	Common Themes
Kitchen	Fruits	Apples and oranges
	Vegetables	Carrots and cucumbers
	Sugar sweetened beverages	Coke
	General space (including: capacity for scratch cooking, capacity for food storage)	Box freezers, capacity for cooking and storage of food for entire center
	Discretionary calories	Chips, pop-tarts, sugary cereals, cookies
Mealtime Observation	Style of service	Staff portioning food for children
	Modeling behaviors	Minimal talk about healthy foods
	Seconds consumed by children	Staff served seconds
	Environmental barriers	Visual and auditory distractions
	General eating area	Environment calm and children engaged
	Foods served	Different than scheduled menu
		Pictures and posters
Classrooms	Nutrition & physical activity signage	
	Food in classroom	Food in classrooms of all ages
	Water in classroom	Not all classrooms with available water
	Space available for play	Room for active play in classroom
	Activities schedule posted	Not available in all classrooms
General Shared Spaces	Policies posted	Nutrition policies
	Parent food sign-up sheet	Holiday party sign-up sheet
	Rules posted	Visitor rules
	Daily activities posted	Current activity schedule available
	Informational pamphlets available	Nutrition and physical activity pamphlets
	Menu posted	Current menu available

Reliability Testing

Inter-rater reliability was conducted for CCEAT instrument and scoring, as well as policy scoring. This was completed to address the capability of the tool to produce dependable results with multiple uses among different researchers.³⁴ Inter-rater reliability was assessed by two independent researchers concurrently completing the CCEAT during pre and post assessment. Inter-rater reliability was assessed for scoring of the CCEAT by three independent researchers scoring the pre and post CCEAT. Inter-rater reliability was assessed for the policy scoring tool by three independent researchers scoring pre and post CCC policies.

Observer Training

Three lead researchers along with the Primary Investigator (PI), and two Co-Investigators were trained during a one day training session which included thorough review of the CCEAT and its components. The purpose of training was to communicate all components of the study to the research team. Following the training, all investigators and lead researchers held a practice data collection session at the Texas State University Childcare Center. During the practice, the research team observed children's mealtime and completed the CCEAT. Once the practice study was completed, the research team reconvened to refine the tool for clarity and ease of use.

Pre-environmental Assessment

The initial environmental assessment of each childcare center was conducted on site by two observers from the researcher team. The goal of the initial environmental assessment was to gather information regarding facilitators and barriers of a healthy environment. Each environmental assessment included: 1) direct observation of the

facility; 2) a record of facilitators and barriers using CCEAT, as well as pictures taken to further describe facilitators and barriers; and 3) collection of policies from the childcare center director.

Workshop/Intervention

The study intervention was a five hour workshop held by researchers for all participating childcare centers' staff. The research staff made presentations on topics of child nutrition, physical activity, built environment, and policies. The environmental and policy presentation explained the importance of a healthy environment, improvement in nutritional knowledge, attitudes, beliefs, and practices of childcare center workers. Each childcare center received pictures and comments of facilitators and barriers to promoting healthy eating and physical activity within their CCC. The outcome of this presentation attempted to improve self-efficacy of childcare center workers to make environmental and policy changes in their center. Each CCC agreed to make at least one policy change to promote healthy eating.

Technical Support

Following the workshop, a team of researchers provided technical support for the childcare centers through email and phone calls. During follow-up calls each researcher, using a script, contacted the childcare center director to inquire about: 1) completion of goals set during the workshop; 2) environmental and policy changes; and 3) additional support or materials needed.

Post Intervention Assessment

Post intervention assessments were completed in the fall of 2013, which provided adequate time for participating centers to implement policy and environmental change.

The research team traveled to each childcare center for completion of the second CCEAT to assess change.

Follow-up Calls

After the post intervention assessment, observed changes from initial to second assessment in each childcare center were noted to confirm validity of the CCEAT. Once changes were assessed, a report was compiled, which was discussed between the auditor and director in a phone interview. The purpose of this audit was to validate observed changes and to describe causation.

Data Analysis

Measures in this study are objective in nature, and bias was reduced with trained researchers completing each phase of the study. Observer bias was reduced using a protocol of two independent observers completing the CCEAT.

CCEAT Scoring

To provide a better perspective of change, CCEAT scoring was developed to rate the individual variables by area observed in the CCCs. The scoring system was developed using current recommendations and calls to action.^{13,35-39} A member of the research team reviewed data collected on the CCEAT during pre and post intervention and allocated points according to the rubric developed by researchers. The scoring system was divided into separate sections of environmental influence observed in the child care centers. Sections include: food score, food environment score, meal time observation score, general environment score, classroom score and total score. The food score includes variety of fruits and vegetables present, including fresh, frozen, and canned, and incorporated extra points for berries, dark green and red/orange vegetables, as well as

negative points for discretionary calories. The food environment score consisted of items such as capacity for scratch cooking, current menu posted in the kitchen and food storage capacity. The meal time observation score included style of meal, modeling by staff, encouragement to try new/less favorite foods and if the food served was the same as the menu. General environment score reviewed the entryway/hallways and general shared spaces in the childcare center and scores were based on items including presence/absence of current menu, posted rules, posted policies and information about breastfeeding. Classroom score examined items such as presence/absence of positive pictures/books/posters related to nutrition and physical activity, water availability, and play opportunities in the classroom. Each area was scored separately to determine the potential extent of intervention effect. A total score was then calculated based on summing all of the areas scored. Three independent researchers used the scoring system to score pre- and post- collected CCEAT data.

Policy Scoring

Policy scoring system examined presence of policies that encourage, facilitate and create follow-through for positive environmental change. Scoring of each participating CCC policy book was determined using a rubric created by the research team. A member of the research team independently read through the policy handbook, searched for the items on the rubric, copied and pasted the language that was found in the handbook and calculated the total score. A second and third member of the research team followed the same process. The three rubrics were then compared, reviewed and adjusted for errors. The policy scoring system was developed to measure the quality of policies present in participating CCC, and was based on the following system: 1) 0=no mention of the item

topic; 2) 1= the topic was mentioned within a recommendation or with vague language; 3) 2=if the topic was addressed in a specific and distinctive manner; 4) 3= if the topic was addressed in a specific and distinctive manner and carryout language was present. The following are examples of polices that were scored: foods served in the CCC, allowable foods to be brought into the CCC, staff modeling behavior, feeding style, water and food in the classroom, screen time, requirement for daily physical activity, posting of policies, and support of breastfeeding.

Statistical Analysis

Intervention effect was evaluated for significance by paired samples t-tests when data was normally distributed, and Wilcoxon signed rank when data was not normally distributed, using SPSS version 20. Differences between pre and post intervention were considered significant if the two-tailed P value was <0.05 . To remove the extraneous influences from the dependent variable of post CCEAT scores, covariates of education of teachers, size of CCC, served lunch (yes or no), and number of hired teachers were examined through analysis of covariance (ANCOVA). Correlations were examined between the dependent variables of post CCEAT scores and covariates including: education of teachers, size of CCC, served lunch (yes or no), and number of hired teachers.

Results

A total of 98 childcare centers were contacted and 34 childcare centers entered the study. Complete pre-post intervention CCEAT data were available for 21 of the childcare centers in the intervention group and 5 in the control group. Reasons for center drop out included CCCs having a change in director, CCCs no longer wanting to participate and

CCCs stating no longer having time to participate. The average capacity of intervention sites was 72.15 (71.03) with an average number of 50.2 (51.82) children served between the ages of six weeks to after-school care. The average capacity of the control sites was 49.8 (21.89) with the average number of 39.50 (19.91) children serve. For full characteristics of childcare centers see Table 3.2.

Table 3.2: CCC Characteristics Including Amount of Change from Pre- to Post- CCEAT Scores.

Site Number	Number of children currently serving	Number of hired teachers	Number of teachers with associates degree	Number of teachers with bachelor's degree	Food Score Change	Food Environment Score Change	Meal time observation score Change	General Environment Score Change	Classroom Score Change	Total CCEAT Score Change
I-1	38	6	1	3	+7	0	+5	-1	+36	+49
I-2	70	8	1	0	+8	+1	0	0	+9	+19
I-3	50	8	2	0	+10	+1	-3	-2	+24	+30
I-4	40	10	1	2	0	-2	-7	0	+20	+11
I-5	4	0	0	0	+2	-1	+3	+1	+17	+22
I-6	65	12	1	2	+4	+3	-1	0	+5	+11
I-7	112	14	1	2	+2	0	+5	+2	+32	+41
I-8	18	4	0	0	0	-1	-2	0	0	-3
I-9	12	2	0	2	-2	0	+5	0	-3	0
I-10	70	11	0	0	+6	0	-5	-5	+10	+6

Table 3.2, continued: CCC Characteristics Including Amount of Change from Pre- to Post- CCEAT Scores.

Site Number	Number of children currently serving	Number of hired teachers	Number of teachers with associates degree	Number of teachers with bachelor's degree	Food Score Change	Food Environment Score Change	Meal time observation score Change	General Environment Score Change	Classroom Score Change	Total CCEAT Score Change
I-11	28	4	2	2	-5	+1	-11	+1	+10	-4
I-12	230	42	5	10	+2	0	+1	-4	+8	+7
I-13	N/A	N/A	N/A	N/A	+2	0	-4	0	+13	+11
I-14	91	N/A	4	2	+4	+1	-7	-2	+7	+3
I-15	27	5	0	3	+12	0	+1	+3	+7	+13
I-16	7	2	0	2	0	-2	+8	-8	+4	+2
I-17	16	4	1	2	+4	0	-6	+1	-3	-4
I-18	68	8	2	1	-7	+2	-2	+2	+2	-3
I-19	14	2	0	1	+1	0	+12	-4	+1	+10
I-20	26	N/A	0	0	+8	-1	+2	-3	+23	+29
I-21	18	5	0	0	-8	-4	+1	0	+29	+18

Table 3.2, continued: CCC Characteristics Including Amount of Change from Pre- to Post- CCEAT Scores.

Site Number	Number of children currently serving	Number of hired teachers	Number of teachers with associates degree	Number of teachers with bachelor's degree	Food Score Change	Food Environment Score Change	Meal time observation score Change	General Environment Score Change	Classroom Score Change	Total CCEAT Score Change
C-1	N/A	11	1	1	-9	-3	+7	0	+7	+2
C-2	24	3	0	0	-5	-1	-8	-1	+30	+15
C-3	49	14	0	7	-5	0	0	+2	+15	+12
C-4	63	8	3	1	+3	0	0	+2	+15	-18
C-5	22	6	1	3	+5	0	-1	-1	-11	-8

Abbreviation: N/A, not available.

I indicates intervention group, C indicates control group

Note: Positive values in change column indicate improvement in that area.

Reliability

The inter-coder reliability of the CCEAT was 94% pre-intervention and 99% post-intervention. Inter-coder reliability for the CCEAT scoring tool was 97% for pre and post-intervention. Inter-coder reliability for the policy scoring tool was 90% pre-intervention and 86% post-intervention.

Pre-to-Post Assessment Changes

While there were not significant changes in all areas of the childcare environment with use of the CCEAT, several statistically significant changes were found. As shown in Table 3.3 (full results can be seen in Appendix B), the intervention group had a significant decrease in discretionary calories ($p=0.000$), a significant increase in “staff encouraging children to try new/less favorite foods” ($p=0.004$). Improvements were seen in “variety of fresh vegetables”, “menu posted in kitchen”, and “food served”, although the mean of change was not significant pre- to post- intervention. Significant improvements were not seen in “variety of fresh fruit”, “water in classroom”, “staff sat with children during mealtime observation”, and “staff consumed same food as children during mealtime”. The control group did not have significant changes in any of the aforementioned variables pre- to post- intervention.

Table 3.3: Mean Changes in Select CCEAT Variables for Intervention and Control CCCs

Variable	Intervention (n=21)				<i>P</i>	Control (n=5)				<i>P</i>
	Pre (Mean	± SD)	Post (Mean	± SD)		Pre (Mean	± SD)	Post (Mean	± SD)	
Fresh Fruit	2.19	1.12	1.90	1.76	0.289	2.60	1.95	0.60	0.89	0.068
Fresh Vegetables	1.67	1.71	2.00	2.14	0.747	2.40	2.70	0.80	1.09	0.109
Discretionary Calories	3.19	2.32	1.00	0.00	0.000*	3.20	1.64	2.20	2.86	0.465
Menu Posted in kitchen	0.67	0.48	0.71	0.46	0.655	1.00	0.00	0.40	0.55	0.083
Policies posted	0.33	0.48	0.10	0.30	0.025*	0.20	0.45	0.40	0.55	0.317
Water in classroom	0.86	0.36	0.81	0.40	0.655	0.60	0.55	0.80	0.45	0.317
Children encouraged by staff to try new/less favorite foods	0.38	0.50	0.86	0.36	0.004*	0.60	0.55	0.80	0.45	0.317
Staff sat with children during mealtime observation	0.48	0.51	0.43	0.51	0.665	0.60	0.55	0.60	0.55	1.00
Staff consumed same food as children during mealtime observation	0.29	0.46	0.29	0.46	1.00	0.40	0.55	0.40	0.55	1.00
Food served same as menu	0.62	0.50	0.67	0.48	0.739	0.60	0.55	0.60	0.55	1.00
* Statistically significant difference between pre- and post-intervention, <i>P</i> <.05.										

CCEAT Scores

Overall, the total CCEAT score for the intervention group increased by 13.06 points. The *total* score for the control group increased 6.2 points. The median \pm SD total CCEAT score for the intervention group was 23.95 ± 13.70 pre-intervention which increased to 36.71 ± 18.88 post-intervention ($P=0.001$). The mean (SD) *total* CCEAT score for the control group was 32.30 ± 12.77 pre-intervention which increased to 38.40 ± 14.10 post-intervention ($P=0.138$) as illustrated in, Table 3.4

Table 3.4: CCEAT Scores for Intervention and Control CCCs										
Scoring Category	Intervention (n=21)				<i>P</i>	Control (n=5)				<i>P</i>
	Pre (Mean \pm SD)		Post (Mean \pm SD)			Pre (Mean \pm SD)		Post (Mean \pm SD)		
Total Food Score	5.86	6.44	8.33	7.84	0.046*	8.40	8.56	6.20	7.66	0.336
Total Food Environment Score	4.76	1.67	4.67	2.31	0.771	4.20	1.79	3.20	2.59	0.102
Meal Time Observation score	5.52	6.00	5.29	5.08	0.846	7.20	4.66	5.40	5.68	0.357
General Environment Score	1.29	2.55	.38	1.60	0.135	1.00	1.22	1.20	1.79	0.705
Classroom Score	6.52	5.48	18.05	13.88	0.000*	11.40	10.26	22.40	5.18	0.138
Total Score	23.95	13.70	36.71	18.88	0.001*	32.20	12.77	38.40	14.10	0.138
* Statistically significant difference between pre- and post-intervention, $P < .05$.										

CCEAT Analysis of Covariates

Results showed that there was a significant correlation between size and post *total food* score ($p=0.019$), post *total* score and size ($p=0.035$), served lunch and *total food* score ($p=0.049$), and education and post environment score ($p=0.001$) as illustrated in Table 3.5. No other significant correlations were found. Levene's Test of Equality of Error of Variances was significant ($p=0.00$) for size, post *total food* score, and served lunch and *total food* score indicating that the variance across the intervention group is not equal, and analysis cannot proceed for size and post *total food* score as well as served lunch and *total food* score. A significant interaction ($p=0.024$) between *total* score and size was found, indicating the homogeneity of regression slopes was violated, meaning the correlation between size and post *total* score differed between groups. Analysis of education and post *environment* score indicated that there was no significant interaction ($p=.276$).

Table 3.5: Correlations for Dependent Variables of CCEAT

Dependent Variable	Education of teachers (n=19)	Size of CCC (n=21)	Served lunch (yes or no) (n=21)	Number of hired teachers (n=19)
	<i>P</i>	<i>P</i>	<i>P</i>	<i>P</i>
Post Total Food Score	0.680	0.019*	0.049	0.074
Post Food Environment Score	0.205	0.054	0.082	0.072
Post Mealtime Observation Score	0.115	0.413	0.957	0.744
Post Environment Score	0.001*	0.324	0.735	0.071
Post Classroom Score	0.996	0.621	0.687	0.687
Post Total Score	0.329	0.035*	0.157	0.138
* Statistically significant difference between pre- and post-intervention, $P < .05$.				

Policy Scoring

Policy scores increased, but not significantly, for both the intervention group from a pre-score of 12.50 ± 7.27 to 14.05 ± 8.34 post ($p=0.94$) and the control group from pre score of 9.60 ± 10.06 to 11.40 ± 12.64 post ($p=0.374$).

Discussion

This study investigated the ability of an intensive workshop intervention to create positive change in the food environment in central Texas CCC by reducing risk factors for obesity in children. Post assessment improvements indicate the intervention workshop achieved some impact. Previous studies have used a workshop as their intervention method; however, to our knowledge this is the first study to give CCC workers visual feedback during the workshop intervention to significantly improve the food environment.^{30,40} The study results suggest that providing a workshop with activities that directly apply to each centers' environment may have been a key facilitator to encouraging change.

The intervention created significant positive changes in CCEAT variables including “discretionary calories”, “number of dark green vegetables”, “vegetable other than potato offered at mealtime”, “presence of pictures and posters about physical activity and nutrition” and “children encouraged by staff to try new/less favorite foods”. Though not all CCEAT variables improved significantly these findings suggest promising changes in the food environment of CCCs. Total environment score, total food score and classroom score improved significantly using the CCEAT scoring instrument in conjunction with the intervention workshop. Improvements in scoring may reveal overall improvements that perhaps cannot be captured with individual variables, giving a better picture of food environment improvement.

Mealtime observation scores did not increase significantly post intervention, perhaps attributable to a need for more education regarding the importance of modeling and the value of a positive and encouraging meal environment. None of the scoring categories in the control group changed significantly from pre- to post- intervention, suggesting the intervention may have been the key to effective change. ANCOVA results indicated that while correlations were found between covariates and the dependent variables of post CCEAT scores, none of the covariates had bias on the results. Specifically, level of education of teachers had no effect on the post environment score. Due to the small size of the control group, covariates were not examined within control group or between control and intervention group. Technical assistance calls indicated CCCs were making positive changes to their policies including additions of policies for outside food, birthday and sugar sweetened beverages; however, overall policy scores did not improve significantly.

Similar studies have used the EPAO tool to assess the CCC food and physical activity environment; the only other tool currently found in literature that is applicable to this environment.¹⁸ Two of these studies implemented an intervention. Ward, et al. found no significant improvements from baseline to follow-up in the environments of the intervention CCC compared to the control CCC.³⁰ Lyn, et al. implemented a worksite wellness policy initiative and found significant improvements in the food and physical activity environment.⁴⁰ To our knowledge, a tool to assess the CCC has not previously been implemented in this south central Texas population. The importance of developing a tool to assess the food environment CCC in the south central Texas region is needed because of the overweight and obesity rates in this area.¹²

A strength of this study was the development of the CCEAT, an in-depth tool to assess the CCC environment because of the unique central Texas population. Another strength of our study is the development of a scoring system for the CCEAT, providing a broader look at the overall and specific areas of the environment of CCC, allowing for an increased number of variables to be assessed. Our study also developed a scoring system for policies to provide insight into level of policy implementation in CCC. Policies have the ability to maintain structure, provide guidance and allow for instruction when deviation from set guidelines occurs. In this study, policy change was discussed during the intervention workshop and a policy activity was provided. However, due to the nature of policy change, additional time, reinforcement, and further education directed towards the need and importance for policy change may have enabled significant change. Policy change has the potential to be more effective if made at the state licensing level, thereby reducing the burden of development on childcare center owners and directors.

While positive effects were seen, there are some limitations of the research. Volume measurements of shelf space could have provided better insight into actual increases and decreases in produce and discretionary calorie availability in each center. Measuring the ratio of positive messaging compared to negative messaging in the environment on the CCEAT could have potentially provided additional understanding of environmental influencers. Due to the small geographic area the sample was drawn from, this study should be regarded as exploratory. However, this study builds upon current knowledge and tools for accessing and addressing environmental concerns in an area with potentially large impacts on childhood obesity prevention.

Implications for Research and Practice

Childhood overweight and obesity prevention is an area of research that continues to be a major focal point of public health interventions and policy development. Promoting healthy environmental norms that influence dietary intake can be established early in a child's life by childcare centers and providers. This study indicates a benefit of using environmental assessment tools to address current facilitators and barriers through direct observation in participating child care environments and building a workshop with applicable content to facilitate change. Increasing awareness about the role of the child care environmental factors that facilitate and provide barriers to the development of healthy behaviors appears to provide a key avenue to prevention of childhood overweight and obesity. Future studies should examine a larger geographic area to determine if this intervention is applicable in different populations. The CCEAT has promising practical applications as an assessment for state licensing and individual CCCs as a self-reflection tool. Future studies are also needed to expand upon current findings in addition to

having an enhanced understanding of optimal ways to influence positive, healthful change in the child care center environment. Subsequent steps should be taken to evaluate parent knowledge, attitudes and beliefs regarding childhood nutrition, food environments, and effective media to education to parents.

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APPENDIX SECTION

APPENDIX A

Childcare Environmental Assessment Tool

Kitchen Area:

- ☐ Not Applicable

Please answer every question as thoroughly as possible. **DO NOT SKIP ANY QUESTIONS.**

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

REFRIGERATOR

- ☐ There is no refrigerator

1. How large is the refrigerator?

- ☐ Please measure the refrigerator with the measuring tape and write down the measurements.

	Length	Width	Height
Total Area			
Fruit storage			
Vegetable storage			
Sweetened beverages			
Milk			
Whole			
Low-fat			
Skim			

2. Do you see fresh **FRUIT**?

- ☐ No
- ☐ Yes
- What kind of **FRESH FRUIT** do you see? (please check all that apply)
 - ☐ Apples
 - ☐ Oranges
 - ☐ Bananas
 - ☐ Grapes
 - ☐ Melon
 - ☐ Peaches
 - ☐ Berries
 - ☐ Pineapple

- ☐ Other: _____
- ☐ _____ Total number of types of fresh fruit

3. Do you see **FRESH VEGETABLES**?

- ☐ No
- ☐ Yes
- What kind of fresh vegetables do you see? (please check all that apply)
 - ☐ Carrots
 - ☐ Squash
 - ☐ Celery
 - ☐ Leafy Greens
 - ☐ Lettuce (iceberg)
 - ☐ Cauliflower
 - ☐ Cucumber
 - ☐ Broccoli
 - ☐ Peppers
 - ☐ Other: _____
- ☐ _____ Total number of types of fresh vegetables

Refrigerator/Freezer Combo

- ☐ There is no refrigerator/freezer combo

4. How large is the refrigerator/freezer combo

	Length	Width	Height
Total Area			
Refrigerator fruit storage			
Freezer fruit storage			
Vegetable storage			
Refrigerator Vegetable storage			
Refrigerator Sweetened beverages			
Freezer sweetened beverages			
Milk			
Whole			
Low-fat			
Skim			

5. Do you see fresh **FRUIT**?

☐ No

☐ Yes

▪ What kind of **FRESH FRUIT** do you see? (please check all that apply)

☐ Apples

☐ Oranges

☐ Bananas

☐ Grapes

☐ Melon

☐ Peaches

☐ Berries

☐ Pineapple

☐ Other:_____

☐ _____Total number of types of fresh fruit

6. Do you see **FRESH VEGETABLES**?

☐ No

☐ Yes

▪ What kind of fresh vegetables do you see? (please check all that apply)

☐ Carrots

☐ Squash

☐ Celery

☐ Leafy Greens

☐ Lettuce (iceberg)

☐ Cauliflower

☐ Cucumber

☐ Broccoli

☐ Peppers

☐ Other:_____

☐ _____Total number of types of fresh vegetables

7. Do you see **FROZEN FRUIT** in the freezer?

☐ No

☐ Yes

▪ What kind of frozen fruit do you see? (please check all that apply)

☐ Berries

☐ Peaches

☐ Cherries

☐ Mixed Fruit

☐ Fruit Juice

☐ Other:_____

☐ _____Total number of types of frozen fruit

8. Do you see **FROZEN VEGETABLES** in the freezer?

☐ No

☐ Yes

☐ What kind of frozen vegetables do you see? (please check all that apply)

☐ Corn

☐ Green Beans

☐ Carrots

☐ Potatoes

☐ Broccoli

☐ Other: _____

☐ _____ Total number of types of frozen vegetables

Box FREEZER

☐ There is no box freezer

9. How large is the freezer

	Length	Width
Total Area		
Fruit storage		
Vegetable storage		
Sweetened beverages		

10. Do you see **FROZEN FRUIT** in the freezer?

☐ No

☐ Yes

☐ What kind of frozen fruit do you see? (please check all that apply)

☐ Berries

☐ Peaches

☐ Cherries

☐ Mixed Fruit

☐ Fruit Juice

☐ Other: _____

☐ _____ Total number of types of frozen fruit

11. Do you see **FROZEN VEGETABLES** in the freezer?

☐ No

☐ Yes

☐ What kind of frozen vegetables do you see? (please check all that apply)

☐ Corn

☐ Green Beans

☐ Carrots

☐ Potatoes

☐ Broccoli

☐ Other: _____

☐ _____ Total number of types of frozen vegetables

DRY STORAGE

☐ There is no dry storage

12. How large is the dry storage space. (please check all that apply)

	Length	Width
Fruit storage		
Vegetable storage		
Sweetened beverages		

13. Do you see **CANNED VEGETABLES** anywhere?

☐ No

☐ Yes

☐ What kind of canned vegetables do you see? (please check all that apply)

☐ Corn

☐ Carrots

☐ Green Beans

☐ Beans

☐ Peas

☐ Tomatoes

☐ Mixed Veggies

☐ Other: _____

☐ _____ Total number of types of canned vegetables

14. Do you see **CANNED FRUIT** anywhere?

- ☐ No
- ☐ Yes
 - What kind of canned fruit do you see? (please check all that apply)
 - ☐ Peaches
 - ☐ Cherries
 - ☐ Oranges
 - ☐ Apples
 - ☐ Juice
 - ☐ Apple Sauce
 - ☐ Mixed Fruit
 - ☐ Other: _____
- ☐ _____ Total number of types of canned fruit
- ☐ _____ Total number of types of canned juice

15. Do you see dried or **DEHYDRATED FRUIT**?

- ☐ No
- ☐ Yes
 - What kind of dried fruit do you see? (please check all that apply)
 - ☐ Apricots
 - ☐ Pineapple
 - ☐ Raisins
 - ☐ Cranberries
 - ☐ Apples
 - ☐ Bananas
 - ☐ Other: _____

16. Are there unhealthy snacks or sodas stored in the kitchen for the staff?

please ask the director/ kitchen manager

- ☐ No
- ☐ Yes
 - What kind of snack or sodas?
 - ☐ Soda
 - ☐ Chips
 - ☐ Candy
 - ☐ Cookies
 - ☐ Crackers (cheez-itz, goldfish, etc)

17. Other: _____ Are there unhealthy snacks or sodas stored in the kitchen for the **children**?

- ☐ No
- ☐ Yes
 - What kind of snack or sodas?
 - ☐ Soda
 - ☐ Chips
 - ☐ Candy
 - ☐ Pop-tarts
 - ☐ Cookies
 - ☐ Crackers
 - ☐ Snack Bars
 - ☐ Other: _____

GENERAL SPACE

18. Is there a stove?

- ☐ Yes
- ☐ No

19. Is there an oven?

- ☐ Yes
- ☐ No

20. Is there a fryer?

- ☐ Yes
- ☐ No

21. Is there a microwave oven?

- ☐ Yes
- ☐ No

22. Describe the overall cooking space.

- ☐ Not enough space to do scratch cooking
- ☐ Large enough to do scratch cooking for the entire day care

23. Is there a recipe book?

- ☐ Yes
- ☐ No

24. Is there a menu posted in the kitchen?

- ☐ Yes
- ☐ No

25. Are there any nutritional information posters or food safety documents posted (hand washing, food temperatures, etc.)?

☐ No

☐ Yes

▪ Please describe them

Please take 2-4 pictures of the kitchen at least **one of the refrigerator and one of the dry storage** and describe each picture that you take.

DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Cafeteria/Eating Area (lunch)

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. How was lunch served? (please check all that apply)

	Infant	Toddler	Pre-K
Family Style?			
Did children serve themselves?			
Delivered in bulk/portioned by staff			

☐

ther: _____

1. Did staff push children to eat more than they want to? (watch a group from start to finish of meal)

☐ Yes

Comments:

☐ No

2. Did you observe seconds being consumed?

☐ Yes

▪ How did the children get the seconds?

☐ Themselves

☐ Staff

☐ No

3. Did staff serve children second helpings without being asked for more by the child? (see an empty plate and add food without request by child)

☐ Yes

▪ What did they give? (please check all that apply)

☐ Everything being served that day

☐ More vegetables

☐ More meat

☐ More fruit

☐ Other: _____

☐ No

4. Did staff encourage children to try new or less favorite foods?

☐ Yes

☐ No

Comments:

☐ Child resisted eating but was not encouraged

5. Are children told to or encouraged to finish their plate?

☐ Yes

☐ No

Comments:

6. Was food used to control behavior?

☐ Yes

▪ What type of behavior? (please check all that apply)

☐ Yelling

☐ Crying

☐ Screaming

☐ Children fighting

☐ Other: _____

☐ No

7. Did staff sit with children during lunch?

☐ No

☐ Yes

▪ Did staff consume the same food as children?

☐ Yes

☐ No

▪ Did they eat something other than what was served to the children?

☐ Yes

☐ No

8. Did staff eat and/or drink less healthy foods in front of children?

☐ No

☐ Yes

▪ What did they eat and/or drink? (please check all that apply)

☐ Chips

☐ Sugar Sweetened Beverages

☐ Crackers

☐ Fast Food

☐ Cookies

☐ Other: _____

9. Did staff talk with children about healthy foods?

☐ Yes

☐ No

Comments:

10. Are the chairs the appropriate height for the children?

☐ Yes

☐ No

☐ Too tall? (children could barely reach to eat)

☐ Too short? (children were hunched over to eat)

11. How many tables are in the eating area?

- ☐ Please write a number

☐ How many chairs are in the cafeteria?

☐ What is the adult to child ratio?

☐ Did they have enough space between each child to be able to comfortably move?

☐ Yes

☐ No (please check all that apply)

☐ They couldn't move their arms much

☐ One child was partially on another child's chair

☐ Other: _____

12. Where any environmental meal-time barriers present?

☐ No

☐ Yes

☐ Television/Visual distractions

☐ Auditory distractions (distant tv/ loud music)

☐ Inadequate lighting

☐ Hostility/hurriedness of staff

☐ High activity near eating area (play room visible to children or similar)

☐ Other: _____

13. How did the children behave during meal time?

☐ Good, the eating environment was calm and the children engaged with eating.

☐ Children engaged with eating, however, the eating environment had many disruptions, noise volume was high, or there were a few behavior issues.

☐ Children did not engage well with eating, but the eating environment was calm

☐ Little eating took place and frequent unruly behavior observed of children

14. Was food served same as the scheduled menu?

☐ Yes

☐ No

15. What was served for lunch? (please write it out)

16. Was there a vegetable (other than potatoes) offered?

- ☐ No
- ☐ Yes (please check all that apply)
 - ☐ Corn
 - ☐ Carrots
 - ☐ Peas
 - ☐ Green Beans
 - ☐ Mixed Veggies
 - ☐ Broccoli
 - ☐ Squash
 - ☐ Other:_____

17. Was fried food offered?(please check all that apply)

- ☐ No
- ☐ Fried Chicken (chicken nuggets, strips, dinosaurs, etc)
 - ☐ French Fries
 - ☐ Fried Fish (fish sticks)
 - ☐ Other:_____

18. Was fruit offered?

- ☐ No
- ☐ Yes (please check all that apply)
 - ☐ Apples
 - ☐ Oranges
 - ☐ Bananas
 - ☐ Peaches
 - ☐ Berries
 - ☐ Other:_____

19. What beverage was offered?

- ☐ Please check all that apply
 - ☐ Milk
 - ☐ Sugar Sweetened Beverages
 - ☐ 100% Juice
 - ☐ Water
 - ☐ Other:_____

20. Is juice offered? (is it 100% juice)

- ☐ No
- ☐ Yes, it is offered
 - ☐ Yes, it is 100% fruit juice?
 - What kind of 100% fruit juice is offered? (please check all that apply)
 - ☐ Cranberry
 - ☐ Apple
 - ☐ Orange
 - ☐ Grape
 - ☐ Other:_____
 - ☐ No, it is not 100% fruit juice
 - What kind of juice that is not 100% fruit juice is offered? (please check all that apply)
 - ☐ Fruit punch
 - ☐ Sunny delight
 - ☐ Other:_____

Please take 2-4 pictures of the cafeteria/eating area and describe each picture that you take.

DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Snack Time (if applicable)

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. How was snack served? (please check all that apply)

	Infant	Toddler	Pre-K
Family Style?			
Did children serve themselves?			
Delivered in bulk/portioned by staff			

☐ Other: _____

2. Did staff push children to eat more than they want to? (watch a group from start to finish of meal)

☐ Yes

☐ No

Comments:

3. Did you observe seconds being consumed?

☐ Yes

▪ How did the children get the seconds?

☐ Themselves

☐ Staff

☐ No

4. Did staff serve children second helpings without being asked for more by the child? (see an empty plate and add food without request by child)

☐ Yes

▪ What did they give? (please check all that apply)

☐ Everything being served that day

☐ More vegetables

☐ More meat

☐ More fruit

☐ Other: _____

☐ No

5. Did staff encourage children to try new or less favorite foods?

☐ Yes

☐ No

Comments:

☐ Child resisted eating but was not encouraged

6. Are children told to or encouraged to finish their snack?

☐ Yes

☐ No

Comments:

7. Was food used to control behavior?

☐ Yes

▪ What type of behavior? (please check all that apply)

☐ Yelling

☐ Crying

☐ Screaming

☐ Children fighting

☐ Other: _____

☐ No

8. Did staff sit with children during snack?

☐ No

☐ Yes

▪ Did staff consume the same food as children?

☐ Yes

☐ No

▪ Did they eat something other than what was served to the children?

☐ Yes

☐ No

9. Did staff eat and/or drink less healthy foods in front of children?

☐ No

☐ Yes

▪ What did they eat and/or drink? (please check all that apply)

☐ Chips

☐ Sugar Sweetened Beverages

☐ Crackers

☐ Fast Food

☐ Cookies

☐ Other: _____

10. Did staff talk with children about healthy foods?

☐ Yes

☐ No

Comments:

11. Are the chairs the appropriate height for the children?

☐ Yes

☐ No

☐ Too tall? (children could barely reach to eat)

☐ Too short? (children were hunched over to eat)

12. How many tables are in the eating area?

- ☐ Please write a number

☐ How many chairs are in the cafeteria?

☐ What is the adult to child **ratio**?

☐ Did they have enough space between each child to be able to comfortably move?

☐ Yes

☐ No (please check all that apply)

☐ They couldn't move their arms much

☐ One child was partially on another child's chair

☐ Other: _____

13. Where any environmental meal-time barriers present?

☐ No

☐ Yes

☐ Television/Visual distractions

☐ Auditory distractions (distant tv/ loud music)

☐ Inadequate lighting

☐ Hostility/hurriedness of staff

☐ High activity near eating area (play room visible to children or similar)

☐ Other: _____

14. How did the children behave during snack time?

☐ Good, the eating environment was calm and the children engaged with eating.

☐ Children engaged with eating, however, the eating environment had many disruptions, noise volume was high, or there were a few behavior issues.

☐ Children did not engage well with eating, but the eating environment was calm

☐ Little eating took place and frequent unruly behavior observed of children

15. Was snack served same as the scheduled menu?

☐ Yes

☐ No

16. What was served for snack? (please write it out)

17. Was there a vegetable (other than potatoes) offered?

- ☐ No
- ☐ Yes (please check all that apply)
 - ☐ Corn
 - ☐ Carrots
 - ☐ Peas
 - ☐ Green Beans
 - ☐ Mixed Veggies
 - ☐ Broccoli
 - ☐ Squash
 - ☐ Other:_____

18. Was fried food offered?(please check all that apply)

- ☐ No
- ☐ Fried Chicken (chicken nuggets, strips, dinosaurs, etc)
 - ☐ French Fries
 - ☐ Fried Fish (fish sticks)
 - ☐ Other:_____

19. Was fruit offered?

- ☐ No
- ☐ Yes (please check all that apply)
 - ☐ Apples
 - ☐ Oranges
 - ☐ Bananas
 - ☐ Peaches
 - ☐ Berries
 - ☐ Other:_____

20. Are crackers offered?

- ☐ No
- ☐ Yes (please check all that apply)
 - ☐ Goldfish
 - ☐ Cheez-Its
 - ☐ Saltines
 - ☐ Other:_____

21. What beverage was offered?

- ☐ Yes (please check all that apply)
 - ☐ Milk
 - ☐ Sugar Sweetened Beverages
 - ☐ 100% Juice
 - ☐ Water
 - ☐ Other:_____
- ☐ No

22. Is juice offered? (is it 100% juice)

- ☐ No
- ☐ Yes, it is offered
 - ☐ Yes, it is 100% fruit juice?
 - What kind of 100% fruit juice is offered? (please check all that apply)
 - ☐ Cranberry
 - ☐ Apple
 - ☐ Orange
 - ☐ Grape
 - ☐ Other:_____
 - ☐ No, it is not 100% fruit juice
 - What kind of juice that is not 100% fruit juice is offered? (please check all that apply)
 - ☐ Fruit punch
 - ☐ Sunny delight
 - ☐ Other:_____

23. Is there a sugar-sweetened beverage offered?

- ☐ No
- ☐ Yes
 - What kind of sugar-sweetened beverage is offered? (please check all that apply)
 - ☐ Soda
 - ☐ Gatorade
 - ☐ Kool-aide
 - ☐ Lemonade
 - ☐ Other:_____

24. Is water offered?

- ☐ Yes
- ☐ No

25. Is milk offered?

- ☐ Yes
- ☐ No

Please take 2-4 pictures of the cafeteria/eating area and describe each picture that you take.

DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Entryway/Hallways/General Shared Spaces

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Was drinking water for children visible in the entryway?
 - ☐ Yes → How accessible was drinking water to children in the classroom?
 - ☐ Available for self-service (child-level fountain or pitcher/cups on table)
 - ☐ Available by request only
 - ☐ No → if no, is there a water fountain in the nearby hallway?
 - ☐ Yes → How accessible is this fountain to children?
 - ☐ Available by request only (must ask permission to leave classroom)
 - ☐ During teacher-designated water breaks
 - ☐ No
2. Were soda and other vending machines present?
 - ☐ No
 - ☐ Yes
 - What type of vending machine is present? (please check all that apply)
 - ☐ Candy/Junk food
 - ☐ Soda
 - ☐ Ice Cream
 - ☐ Other: _____
 - Where is the vending machine located? (please check all that apply)
 - ☐ In front of the building
 - ☐ In the entryway
 - ☐ In the employee break room
 - ☐ Other: _____
 - Is the vending machine accessible to children?
 - ☐ Yes
 - ☐ No
3. Are there menus posted? (Please take a zoomed in picture of the menu(s) that is posted)
 - ☐ No
 - ☐ Yes
 - Is it a current menu?
 - ☐ Yes
 - ☐ No

4. Are there informational pamphlets available?
- ☐ No
 - ☐ Yes
 - What kinds of pamphlets are present? (please check all that apply)
 - ☐ Nutrition information
 - ☐ Breastfeeding information
 - ☐ feeding information
 - ☐ Physical activity information
 - ☐ Other:_____
5. Is there a schedule of daily activities posted?
- ☐ No
 - ☐ Yes
 - Is it a current schedule?
 - ☐ Yes
 - ☐ No
6. Is there a message board?
- ☐ No
 - ☐ Yes
 - What messages are on the board? (please check all that apply)
 - ☐ Business flyers
 - ☐ For sale flyers
 - ☐ Animal postings
 - ☐ Other:_____
7. Are there rules posted?
- ☐ No
 - ☐ Yes
 - What rules are posted? (please check all that apply)
 - ☐ Visitor rules
 - ☐ Child rules
 - ☐ Other:_____
8. Are policies posted? (Please take a zoomed in picture of the menu(s) that is posted)
- ☐ No
 - ☐ Yes
 - What policies are posted? (please check all that apply)
 - ☐ Physical activity
 - ☐ Breastfeeding
 - ☐ Nutrition
 - ☐ Holiday parties
 - ☐ Other:_____

9. Is there a schedule of when parents are bringing in any food or a sign in sheet to bring in food?

☐ No

☐ Yes

▪ What is the schedule is for? (please check all that apply)

☐ Holiday parties

☐ Birthday parties

☐ Snack sign up

Classroom/Learning Area (Infants)

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Was a TV present in the room?

☐ No

☐ Yes

▪ Was the TV on?

☐ Yes

☐ No

2. Was TV viewing observed?

☐ Yes

☐ No

3. Was a computer present in the room for use by children?

☐ Yes

☐ No

4. Was video game or computer game playing observed?

☐ Yes

☐ No

5. Were any posters, pictures or books very obviously displayed about physical activity present in the room?

☐ No

☐ Yes - > How many?

☐ Pictures _____

☐ Posters _____

☐ Books _____

☐ Other _____

6. Were any posters, pictures or books very obviously displayed about nutrition present in the observation room?

☐ No

☐ Yes -> How many?

☐ Pictures _____

☐ Posters _____

☐ Books _____

☐ Other _____

7. Is there a schedule of daily activities posted?
- ☐ Yes
 - ☐ No
8. Do children eat in the classroom?
- ☐ Yes
 - ☐ No
9. Is there food in the classroom?
- ☐ Yes
 - ☐ No
 - Do the children have free access to the food and what is the food?
 - ☐ Yes
 - ☐ Food _____
 - ☐ No
10. Is there water in the classroom?
- ☐ Yes
 - ☐ No
11. Are there play opportunities in the classroom?
- ☐ No
 - ☐ Yes
 - ☐ Large rug to move
 - ☐ Toys that encourage movement
 - ☐

Please take 2-4 pictures of the classroom and describe each picture that you take.
DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Classroom/Learning Area (Toddlers)

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Was a TV present in the room?

☐ No

☐ Yes

▪ Was the TV on?

☐ Yes

☐ No

2. Was TV viewing observed?

☐ Yes

☐ No

3. Was a computer present in the room for use by children?

☐ Yes

☐ No

4. Was video game or computer game playing observed?

☐ Yes

☐ No

5. Were any posters, pictures or books very obviously displayed about physical activity present in the room?

☐ No

☐ Yes - > How many?

☐ Pictures _____

☐ Posters _____

☐ Books _____

☐ Other _____

6. Were any posters, pictures or books very obviously displayed about nutrition present in the room?

☐ No

☐ Yes - > How many?

☐ Pictures _____

☐ Posters _____

☐ Books _____

☐ Other _____

7. Do children eat in the classroom?

☐ Yes

☐ No

8. Is there a schedule of daily activities posted?

☐ Yes

☐ No

9. Are there play opportunities in the classroom?

☐ No

☐ Yes

☐ Large rug to move

☐ Toys that facilitate movement

10. Is there food in the classroom?

☐ Yes -> Do the children have free access to the food and what is the food?

☐ Yes

☐ Food _____

☐ No

☐ No

11. Is there water in the classroom?

☐ Yes

☐ No

Please take 2-4 pictures of the classroom and describe each picture that you take.
DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Classroom/Learning Area (Pre-K)

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Was a TV present in the room?

☐ Yes

▪ Was the TV on?

☐ Yes

☐ No

☐ No

2. Was TV viewing observed?

☐ Yes

☐ No

3. Was a computer present in the room for use by children?

☐ Yes

☐ No

4. Was video game or computer game playing observed?

☐ Yes

☐ No

12. Were any posters, pictures or books very obviously displayed about physical activity present in the room?

☐ No

☐ Yes - > How many?

☐ Pictures _____

☐ Posters _____

☐ Books _____

☐ Other _____

13. Were any posters, pictures or books very obviously displayed about nutrition present in the room?

☐ No

☐ Yes - > How many?

☐ Pictures _____

☐ Posters _____

☐ Books _____

☐ Other _____

5. Do children eat in the classroom?
- ☐ Yes
 - ☐ No
6. Is there a schedule of daily activities posted?
- ☐ Yes
 - ☐ No
7. Are there play opportunities in the classroom?
- ☐ Yes
 - ☐ Large rug to move
 - ☐ Balls
 - ☐ Hula hoops
 - ☐ No
8. Is there food in the classroom?
- ☐ Yes
 - Do the children have free access to the food and what is the food?
 - ☐ Yes
 - ☐ Food_____
 - ☐ No
 - ☐ No
9. Is there water in the classroom?
- ☐ Yes
 - ☐ No

Please take 2-4 pictures of the classroom and describe each picture that you take.
DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Indoor Play Area

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Is structured physical activity observed?

☐ Yes

☐ If yes, is staff involved in play time?

☐ If yes, how are they involved? (please check all that apply)

☐ Run round with the children.

☐ They do the same activities as the children do

☐ No

2. Do staff direct play time?

☐ No

☐ Yes

▪ How do they direct play time? (please check all that apply)

☐ Specific games

☐ Encourage them to be more involved

☐ Tell them where to play

3. Indoor play equipment: (Please place a check for every item that you see)

	All ages together	Infants	Toddlers	Preschool
Balancing surfaces (balance beams, boards, etc.)				
Basketball hoop				
Climbing structures (jungle gyms, ladders, etc.)				
Merry-go-round				
Pool				
Sandbox				
See-saw				
Swinging equipment (swings, rope, etc.)				
Path/sidewalk for riding toys (wagon, scooters, etc.)				
Tunnels				
Climbing structures (ladders, jumble gyms, etc.)				
Floor play equipment (tumbling mats, carpet squares, etc.)				
Jumping play equipment (jump ropes, hula hoops)				
Parachute				
Push/pull toys (wagon, scooters, etc.)				
Riding toys (tricycles, cars, etc.)				
Rocking & twisting toys (rocking horse, sit-n-spin, etc.)				
Sand/water play toys (buckets, scoops, shovels, etc.)				
Slides				
Twirling play equipment (ribbons, scarves, batons, etc.)				
Drinking water available				

Please take 2-4 pictures of the classroom and describe each picture that you take.
DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Outside Play Area

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Is structured physical activity observed?

☐ Yes

☐ If yes, is staff involved in play time?

☐ If yes, how are they involved? (please check all that apply)

☐ Run round with the children.

☐ They do the same activities as the children do

☐ No

2. Do staff direct play time?

☐ No

☐ Yes

☐ How do they direct play time? (please check all that apply)

☐ Specific games

☐ Encourage them to be more involved

☐ Tell them where to play

☐ N/A

3. Outdoor play equipment: (Please place a check for every item that you see)

	All ages together	Infants	Toddlers	Preschool
Balancing surfaces (balance beams, boards, etc.)				
Basketball hoop				
Merry-go-round				
Pool				
Sandbox				
See-saw				
Slides				
Swinging equipment (swings, rope, etc.)				
Path/sidewalk for riding toys (wagon, scooters, etc.)				
Tunnels				
Climbing structures (ladders, jumble gyms, etc.)				
Floor play equipment (tumbling mats, carpet squares, etc.)				
Jumping play equipment (jump ropes, hula hoops)				
Parachute				
Push/pull toys (wagon, scooters, etc.)				
Riding toys (tricycles, cars, etc.)				
Rocking & twisting toys (rocking horse, sit-n-spin, etc.)				
Sand/water play toys (buckets, scoops, shovels, etc.)				
Twirling play equipment (ribbons, scarves, batons, etc.)				
Drinking water available				

4. Outdoor play space includes:

- ☐ No open running spaces or path/sidewalk for wheeled toys
- ☐ Very limited open running space, no path/sidewalk for wheeled toys
- ☐ Plenty of running space, no path/sidewalk for wheeled toys
- ☐ Plenty of open running spaces and a path/sidewalk for wheeled toys

Please take 2-4 pictures of the classroom and describe each picture that you take.
DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

Breastfeeding Area (if applicable)

Please answer every question as thoroughly as possible. DO NOT SKIP ANY QUESTIONS.

Terms: Infant: 6 wks-15 months. Toddler: 16 months – 24 months. Pre-K: 25 months – 5 yrs

☐ **Not Applicable**

1. Is there a designated area for breastfeeding?

☐ No

☐ Yes

▪ Description of this area (please check all that apply)

☐ There is a chair for moms to sit in

☐ The area is well lit

☐ The area is private

☐ Other: _____

Please take 2-4 pictures of the breastfeeding area and describe each picture that you take.
DO NOT TAKE PICTURES WITH ANY CHILDREN IN THEM!

1. _____

2. _____

3. _____

4. _____

APPENDIX B

Table 4.1: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)				<i>P</i>	Control (n=5)				<i>P</i>
	Pre (Mean	± SD)	Post (Mean	± SD)		Pre (Mean	± SD)	Post (Mean	± SD)	
Number of fresh fruit	2.19	1.12	1.90	1.76	0.289	0.260	1.95	0.60	0.89	0.068
Number of fresh vegetables	1.67	1.71	2.00	2.14	0.747	2.40	2.70	0.80	1.10	0.109
Number of dark green vegetables	0.14	0.36	0.67	0.66	0.002*	0.60	0.89	0.00	0.00	0.180
Number of red/orange vegetables	0.62	0.74	0.67	0.73	0.755	0.80	0.45	0.20	0.45	0.083
Number of starchy vegetables	0.05	0.22	0.05	0.22	1.00	0.20	0.45	0.20	0.45	1.00
Number of frozen fruit	0.14	0.48	0.19	0.40	0.564	6.40	5.01	1.60	2.07	0.068
Number of frozen vegetables	1.38	2.06	1.52	2.06	0.450	0.20	0.45	1.20	1.79	0.180
Number of frozen dark green vegetables	0.38	0.59	0.24	0.44	0.257	0.00	0.00	0.20	0.45	0.317
Number of frozen red/orange vegetables	0.19	0.40	0.24	0.44	0.317	0.20	0.45	0.40	0.55	0.317
Number of frozen starchy vegetables	0.57	0.87	0.67	0.97	0.516	0.00	0.00	0.40	0.89	0.317
Number of discretionary calories	3.19	2.32	1.00	0.00	0.000*	3.20	1.64	2.20	2.86	0.465
Kitchen: Posted menu	0.67	0.48	0.71	0.46	0.655	1.00	0.00	0.40	0.55	0.083
Kitchen: Nutritional/food safety posters	0.62	0.50	0.67	0.48	0.655	0.40	0.55	0.75	0.50	0.317
Mealtime: Toddler family style	0.14	0.36	0.00	0.00	0.083	0.00	0.00	0.00	0.00	1.00

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Mealtime: Pre-K family style	0.19	0.40	0.10	0.30	0.157	0.00	0.00	0.20	0.45	0.317
Mealtime: Toddlers served themselves	0.14	0.36	0.00	0.00	0.083	0.00	0.00	0.20	0.45	0.317
Mealtime: Pre-K served themselves	0.19	0.40	0.05	0.22	0.083	0.20	0.45	0.00	0.00	0.317
Mealtime: Staff served seconds without asking	0.00	0.00	0.14	0.36	0.083	0.00	0.00	0.20	0.45	0.317
Mealtime: Staff delivered in bulk/portioned by staff (toddler)	0.38	0.50	0.29	0.46	0.414	0.60	0.55	0.40	0.55	0.317
Mealtime: Staff delivered in bulk/portioned by staff (Pre-K)	0.38	0.50	0.57	0.51	0.102	0.60	0.55	0.20	0.45	0.157
Mealtime: children pushed to eat more	0.14	0.36	0.19	0.40	0.655	0.20	0.45	0.20	0.45	1.00
Mealtime: consumption of seconds	0.71	0.46	0.76	0.44	0.705	0.80	0.45	0.80	0.45	1.00
Mealtime: Staff served seconds	0.57	0.51	0.71	0.46	0.257	0.60	0.55	0.60	0.55	1.00
Mealtime: Children served themselves seconds	0.19	0.40	0.10	0.30	0.157	0.20	0.45	0.20	0.45	1.00
Mealtime: When staff served seconds they served more vegetables	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: When staff served seconds they served more fruit	0.00	0.00	0.14	0.36	0.083	0.00	0.00	0.20	0.45	0.317

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Mealtime: When staff served seconds they served more of everything served that day	0.00	0.00	0.14	0.36	0.083	0.20	0.45	0.40	0.55	0.564
Mealtime: When staff served seconds they served more potatoes	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Staff encouraged children to try new/less favorite foods	0.38	0.50	0.86	0.36	0.004*	0.60	0.55	0.80	0.45	0.317
Mealtime: Children resisted eating but were not encouraged	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.20	0.45	0.317
Mealtime: Children encouraged to finish plate	0.48	0.51	0.95	0.22	0.002*	0.60	0.55	0.60	0.55	1.00
Mealtime: Food used to control behavior	0.00	0.00	0.48	0.51	0.002*	0.00	0.00	0.60	0.55	0.083
Mealtime: Food used to control yelling	0.00	0.00	0.14	0.36	0.083	0.00	0.00	0.00	0.00	1.00
Mealtime: Food used to control crying	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Food used to control children playing	0.00	0.00	0.10	0.30	0.157	0.00	0.00	0.00	0.00	1.00
Mealtime: Food used to control talking	0.00	0.00	0.10	0.30	0.157	0.00	0.00	0.20	0.45	0.317
Mealtime: Staff sat with children	0.48	0.51	0.43	0.51	0.655	0.60	0.55	0.60	0.55	1.00
Mealtime: Staff consumed same food as children	0.29	0.46	0.29	0.46	1.00	0.40	0.55	0.40	0.55	1.00
Mealtime: Staff consumed something else	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Mealtime: Staff talked with children about healthy foods	0.19	0.40	0.38	0.50	0.157	0.40	0.55	0.00	0.00	0.157
Mealtime: Chairs appropriate height for children	0.95	0.22	0.95	0.22	1.00	1.00	0.00	0.80	0.45	0.317
Mealtime: Enough space between children to move comfortably	0.95	0.22	0.95	0.22	1.00	0.80	0.45	0.80	0.45	1.00
Mealtime: Environmental barriers – TV/visual distractions	0.10	0.30	0.29	0.46	0.102	0.20	0.45	0.00	0.00	0.317
Mealtime: Environmental barriers – children playing everywhere	0.05	0.22	0.05	0.22	1.00	0.00	0.00	0.20	0.45	0.317
Mealtime: Environmental barriers – staff hostility/hurriedness	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Environmental barriers – high activity area	0.10	0.30	0.19	0.40	0.317	0.40	0.55	0.20	0.45	0.317
Mealtime: Child behavior during mealtime – Good, environment calm; children engaged with eating	0.62	0.50	0.71	0.46	0.414	0.40	0.55	0.60	0.55	0.317
Mealtime: Child behavior during mealtime – children engaged in eating, disruptions in environment	0.29	0.46	0.29	0.46	1.00	0.40	0.55	0.20	0.45	0.564

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Mealtime: Child behavior during mealtime – children not engaged with eating, environment calm	0.05	0.22	0.05	0.22	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: Child behavior during mealtime – little eating, unruly behavior from children	0.10	0.30	0.00	0.00	0.157	0.40	0.55	0.00	0.00	0.157
Mealtime: Food served same as scheduled menu	0.62	0.50	0.67	0.48	0.739	0.60	0.55	0.60	0.55	1.00
Mealtime: Vegetable (other than potatoes) offered	0.43	0.51	0.67	0.48	0.025*	0.40	0.55	0.40	0.55	1.00
Mealtime: Vegetable offered – corn	0.14	0.36	0.05	0.22	0.317	0.00	0.00	0.20	0.45	0.317
Mealtime: Vegetable offered – carrots	0.10	0.30	0.10	0.30	1.00	0.20	0.45	0.20	0.45	1.00
Mealtime: Vegetable offered – green beans	0.05	0.22	0.05	0.22	1.00	0.20	0.45	0.20	0.45	1.00
Mealtime: Vegetable offered – mixed vegetables	0.10	0.30	0.00	0.00	0.157	0.00	0.00	0.00	0.00	1.00
Mealtime: Vegetable offered – broccoli	0.00	0.00	0.10	0.30	0.157	0.00	0.00	0.00	0.00	1.00
Mealtime: Vegetable offered – cauliflower	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Vegetable offered – salad mix	0.14	0.36	0.05	0.22	0.157	0.00	0.00	0.00	0.00	1.00
Mealtime: Vegetable offered – spinach	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Vegetable offered – tomato	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Vegetable offered – cucumber	0.00	0.00	0.10	0.30	0.157	0.00	0.00	0.00	0.00	1.00

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Mealtime: Fried foods offered	0.10	0.30	0.10	0.30	1.00	0.00	0.00	0.20	0.45	0.317
Mealtime: Fried chicken offered	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: French fries offered	0.10	0.30	0.00	0.00	0.157	0.00	0.00	0.00		1.00
Mealtime: Fried fish offered	0.10	0.30	0.05	0.22	0.317	0.00	0.00	0.20	0.45	0.317
Mealtime: Tater tots offered	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Fruit offered	0.76	0.44	0.81	0.40	0.705	0.40	0.55	0.60	0.55	0.317
Mealtime: Apples offered	0.05	0.22	0.05	0.22	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: Oranges offered	0.10	0.30	0.24	0.44	0.180	0.00	0.00	0.20	0.45	0.317
Mealtime: Bananas offered	0.10	0.30	0.10	0.30	1.00	0.20	0.45	0.20	0.45	1.00
Mealtime: Peaches offered	0.05	0.22	0.10	0.30	0.564	0.00	0.00	0.20	0.45	0.317
Mealtime: Grapes offered	0.05	0.22	0.10	0.30	0.564	0.00	0.00	0.00	0.00	1.00
Mealtime: Pears offered	0.14	0.36	0.14	0.36	1.00	0.00	0.00	0.20	0.45	0.317
Mealtime: Watermelon offered	0.05	0.22	0.05	0.22	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: Mixed fruit offered	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Mandarin oranges offered	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Mealtime: Pineapple offered	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Berries offered	0.05	0.22	0.05	0.22	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: Crackers offered	0.24	0.44	0.24	0.44	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: Cheez-its offered	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Graham crackers	0.05	0.22	0.05	0.22	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: Ritz offered	0.10	0.30	0.00	0.00	0.157	0.00	0.00	0.00	0.00	1.00
Mealtime: Animal crackers	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Wheat thins	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Triscuits offered	0.05	0.22	0.14	0.36	0.157	0.00	0.00	0.00	0.00	1.00
Mealtime: Pretzels offered	0.00	0.00	0.05	0.22	0.317	0.00	0.00	0.00	0.00	1.00
Mealtime: Beverage offered	0.95	0.22	1.00	0.00	0.317	0.80	0.45	0.80	0.45	1.00
Mealtime: Milk offered	0.62	0.50	0.67	0.48	0.564	0.80	0.45	0.80	0.45	1.00
Mealtime: Sugar sweetened beverages	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00
Mealtime: 100% juice offered	0.10	0.30	0.05	0.22	0.564	0.00	0.00	0.00	0.00	1.00
Mealtime: Water offered	0.57	0.51	0.67	0.48	0.317	0.00	0.00	0.25	0.50	0.317

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Classrooms: TV present	0.33	0.48	0.19	0.40	0.180	0.40	0.55	0.20	0.45	0.317
Classrooms: TV on	0.05	0.22	0.00	0.00	0.317	0.20	0.45	0.00	0.00	0.317
Classrooms: TV viewing observed	0.05	0.22	0.00	0.00	0.317	0.20	0.45	0.00	0.00	0.317
Classrooms: Computer present for use by children	0.24	0.44	0.24	0.44	1.00	0.00	0.00	0.00	0.00	1.00
Classrooms: Video game/computer game playing observed	0.10	0.30	0.00	0.00	0.157	0.00	0.00	0.00	0.00	1.00
Classrooms: Posters, pictures, or books about physical activity	0.24	0.44	0.62	0.50	0.011*	0.00	0.00	0.60	0.55	0.083
Classrooms: Pictures about physical activity	0.14	0.36	0.52	0.51	0.005*	0.00	0.00	0.40	0.55	0.157
Classrooms: Posters about physical activity	0.05	0.22	0.33	0.48	0.034*	0.00	0.00	0.60	0.55	0.083
Classrooms: Books about physical activity	0.05	0.22	0.14	0.36	0.317	0.00	0.00	0.00	0.00	1.00
Classrooms: Posters, pictures or books about nutrition	0.38	0.50	0.90	0.30	0.002*	0.40	0.55	0.80	0.45	0.157
Classrooms: Pictures about nutrition	0.05	0.22	0.62	0.50	0.001*	0.20	0.45	0.60	0.55	0.317
Classrooms: Posters about nutrition	0.33	0.48	0.67	0.48	0.020*	0.20	0.45	0.60	0.55	0.317
Classrooms: Books about nutrition	0.10	0.30	0.29	0.46	0.157	0.40	0.55	0.00	0.00	0.157

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
Classrooms: Schedule of daily activities posted	0.90	0.30	0.90	0.30	1.00	1.00	0.00	0.80	0.45	0.317
Classrooms: Do children eat in the classroom	0.90	0.30	0.81	0.40	0.157	1.00	0.00	0.80	0.45	0.317
Classrooms: Food in the classroom	0.57	0.51	0.67	0.48	0.317	0.40	0.55	0.60	0.55	0.317
Classrooms: Do children have free access to food in classroom	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00
Classrooms: Is there water in the classroom	0.86	0.36	0.81	0.40	0.655	0.60	0.55	0.80	0.45	0.317
Classrooms: Play opportunities in the classroom	0.95	0.22	0.90	0.30	0.317	1.00	0.00	0.80	0.45	0.317
Classrooms: Toys that encourage movement	0.71	0.46	0.81	0.40	0.317	0.60	0.55	0.80	0.45	0.564
General space: Menu posted	0.62	0.50	0.33	0.48	0.034*	0.60	0.55	0.60	0.55	1.00
General space: Menu current	0.57	0.51	0.33	0.48	0.059	0.60	0.55	0.40	0.55	0.317
General space: Nutrition information present	0.05	0.22	0.10	0.30	0.564	0.20	0.45	0.00	0.00	0.317
General space: Breastfeeding information present	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.00	0.00	1.00
General space: Schedule of daily activities posted	0.48	0.51	0.24	0.44	0.059	0.40	0.55	0.40	0.55	1.00
General space: Schedule of daily activities posted – current	0.52	0.51	0.24	0.44	0.034*	0.40	0.55	0.40	0.55	1.00
General space: Rules posted	0.10	0.30	0.14	0.36	0.564	0.40	0.55	0.40	0.55	1.00

Table 4.1, continued: Complete List of CCEAT Variable Results

Variable	Intervention (n=21)					Control (n=5)				
	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>	Pre (Mean	± SD)	Post (Mean	± SD)	<i>P</i>
General space: Visitor rules posted	0.05	0.22	0.05	0.22	0.317	0.00	0.00	0.20	0.45	0.317
General space: Child rules posted	0.05	0.22	0.00	0.00	0.317	0.00	0.00	0.20	0.45	0.317
General space: Policies posted	0.33	0.48	0.10	0.30	0.025*	0.20	0.45	0.40	0.55	0.317
General space: Parent food sign-in sheet or schedule posted	0.00	0.00	0.10	0.30	0.157	0.00	0.00	0.00	0.00	1.00
* Statistically significant difference between pre- and post-intervention, $P < .05$.										