RESULTS OF CHILD CARE CENTERS' NUTRITION AND PHYSICAL ACTIVITY ENVIRONMENT SELF ASSESSMENTS

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Abstract

Many preschool children spend substantial time in out of home child care. Therefore, the child care nutrition and physical activity environment has the potential to exert considerable influence on childhood obesity. The purpose of this study was to describe results of The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) instruments that child care center directors completed between July 2006 and August 2008 as part of a childhood obesity prevention project in New York State. The NAP SACC instrument consists of 56 individual items group into two sections. Section I consists if nine nutrition areas of focus (e.g. Fruits and Vegetables), and Section II addresses six physical activity areas of focus (e.g. TV Use and TV Viewing). Data from 125 matched pre and post program implementation NAP SACC instruments were analyzed. Child care centers rated themselves high on most NAP SACC items with a mean pre-intervention score of 3.1 (4 point scale; 4=best practice). Head Start centers were more likely ($P<0.05$) to assess their centers closer to best practice on nine nutrition and seven physical activity items. One-hundred and eleven centers identified 210 areas to improve upon (centers could choose up to two). The most frequently reported areas for improvement were nutrition and physical activity training and education. Of the 205 areas for improvement that had pre and post intervention scores, 10.2% (n=21) decreased, 43.4% (n=89) were unchanged, and 46.3 % (n=95) increased at post intervention. Overall, NAP SACC ratings significantly increased ($P<0.05$) on 11 nutrition and 7 physical activity NAP SACC items. While these results are not able to assess program impact, they suggest that child care centers are interested in receiving nutrition and physical activity education and training, and could benefit from comprehensive environmental interventions.

Chapter I

Introduction & Literature Review

Nearly one quarter of all children in the United States aged two to five years are estimated to have a body mass index (BMI) greater than or equal to the 85th percentile, indicating overweight or obesity (1). In 2005, more than 57% of children six years old and younger attended center-based child care (2). Many of these preschool children may spend 35 hours or more per week receiving nonparental care (3). Because such a substantial number of preschool children spend a significant amount of time in out of home child care, researchers, policymakers and public health officials are beginning to recognize the potential role of the child care setting in childhood obesity prevention (4).

1.1 Nutrition of Preschool Age Children in Child Care Settings

When compared with the school environment, relatively little is known about the current state of nutrition and physical activity in child care settings. In 1995, the Child and Adult Care Food Program (CACFP) conducted a national survey of the meals and snacks served and consumed in its child care sites (5). CACFP is a federal child nutrition program administered through grants to the states which provides reimbursement for meals and snacks served to children at eligible child care centers (6). Data on foods served were obtained using a Menu Survey which was completed by 1,962 child care providers. Data on foods consumed were collected by direct observations of meals and snacks at child care centers. A subsample of 1,347 children between the ages of one and ten years was observed. The study found that on average CACFP breakfasts and lunches offered met or exceeded the standards of one-fourth the RDA for breakfasts and one-third the RDA for lunches. Breakfasts were found to be consistent with the

report's recommendations for percent of total energy from fat (<30%) and carbohydrate (at least 55%), as well as amount of sodium (<2400 mg per day) and cholesterol (<300 mg per day). Breakfasts averaged 23% of energy from fat, 64% of energy from carbohydrate, 51 mg of cholesterol and 445 mg of sodium. However, breakfasts provided 11% of energy from saturated fat which exceeded the recommendation of less than 10%. Lunches failed to meet recommendations for percentage of energy from fat, saturated fat and carbohydrate, with the average CACFP lunch containing 35% of energy from fat, 14% from saturated fat and 47% from carbohydrate. Lunches also exceeded the recommended level of sodium with an average sodium content of 919 mg as compared with the recommendation of 800 mg or less. This survey only evaluated the fat, saturated fat, carbohydrate, cholesterol and sodium content for meals served to children five years old and older. No evaluation of these nutrients for preschool aged children was conducted, and the nutritional adequacy of snacks served was not examined.

Smaller scale studies prior to and following the CACFP national survey have provided evidence that the child care nutrition and physical activity environment is in need of improvement (7-9). A 1992 study analyzed the nutrient content of 10-days of planned menus for breakfast, mid-morning snack, lunch, and afternoon snack at 46 licensed child care centers in Missouri (7). Nutrient values were obtained for kilocalories, protein, vitamin A, ascorbic acid, thiamin, riboflavin, niacin, calcium, iron, pyridoxine, folic acid, cobalamin, magnesium and zinc. The study found menus to be deficient in energy, iron, zinc, magnesium, vitamin A, and folic acid. Menus examined in this study featured green leafy vegetables less than once peer week or not at all and hot dogs or luncheon meats an average of twice per week. These findings raise concerns regarding the availability of several micronutrients and energy in the food served in child care.

Oakley and colleagues (8) compared the nutrient content of 5-day lunch menus from licensed child care centers in Mississippi. In addition to energy and most of the nutrients examined in the Missouri study, the authors evaluated total fiber, total fat, and sodium content of the menus. Menus also were examined for their compliance with meal pattern guidelines established by the Child and Adult Care Food Program (CACFP) and the Head Start Performance Standards. In spite of the fact that all but one of the menus met the CACFP and Head Start requirements, researchers concluded that mean total fat and sodium levels were excessive. The mean percentage of energy from fat for CACFP participating centers (n=69) was 41%, and for non-participating centers (n=23) it was 38%. CACFP centers' mean value for sodium in lunch was 789 mg and non-CACFP centers' mean sodium value was 792 mg. One-third the RDA estimated minimum requirement for sodium for children 2 to 5 years old was 300 mg per day.

While the above two studies relied on menu analysis to evaluate the nutritional adequacy of food served in child care, Fleischhacker et al. (9) examined actual food intake. The investigators conducted a pilot study to compare a Head Start child care center menu with the actual food served at the center. The contents of 269 meals and snacks observed at an inner-city Head Start center were compared with the monthly menus that the center provided to parents. Only four complete meals matched the meals described on the menus. When the 861 individual foods that were observed being served were compared with the 895 food items listed on the menu, only 74 foods matched, excluding milk. Some foods were listed on the menu and were never served at all during the course of the study. This raises questions as to the validity of menu examination as a method of evaluation of the nutrition environment in child care settings.

More recent studies of children's intakes in child care have utilized direct observation of food served and consumed as opposed to menu evaluation. Padget and colleagues (10) observed the meals and snacks of 50 children aged 3 to 5 years who attended full day child care and consumed either one meal and two snacks or two meals and one snack while in care. While this study did not provide an analysis of food served versus food consumed, the researchers assert that observation is a more valid method of evaluating nutritional adequacy than analysis of menus or food served. Investigators compared the children's dietary intake with 1992 Food Guide Pyramid for Young Children in order to evaluate the proportion of recommendations consumed by children while in child care. Parents of children in the study completed a 3-day diet record of their child's dietary intake before and after child care. During the observed meals, none of the children in the study consumed two-thirds of the vegetable recommendation, and none of the 4 to 5 year olds met even half of the requirement. Only 18.2% (n= 4) of 3 year olds and 3.6% (n=1) of 4 to 5 year olds met two thirds of the grain recommendations. While 72.7% (n=16) of 3 year olds met the fruit requirement, only 25% (n=7) of 4 to 5 year old children did. Examination of intake from parent-completed 3-day diet records indicated that only 12% of children (n=6) met vegetable requirements, and only 25% (n=12) met grain requirements. Sixty percent (n=30) consumed sufficient dairy and 48% (n=24) consumed enough meat. Forty-six percent (n=23) ate the recommended amount of fruit. While food consumed at home did compensate for some of the deficiencies at the child care center, only 6% of the children in this study met Food Guide Pyramid recommendations for every food group.

Ball and colleagues (11) confirmed the findings of Padget et al. (10) by directly observing the food consumed by 117 children during meals and snacks at 20 child care centers located in North Carolina. Mean servings of food groups consumed were compared with

MyPyramid food group recommendations for 2 to 5 year olds in order to determine whether they met one half to two thirds of the recommended amounts. On average, children consumed less than 13% of the recommended amount of whole grains and only 7% for dark vegetables. Even when children did meet the recommended number of MyPyramid servings for a food group, the food consumed was not of the highest nutritional value. For instance, while children drank 70% of the recommended amount of milk, more than half of the milk consumed was whole milk and only 11% was 1% or non fat milk. Children consumed close to 50% of the daily maximum recommended amount of 100% fruit juice, and 75% of the meat consumed was either high-fat or fried.

The nutrient content of food served in child care is not the only factor that may influence a child's nutritional well being. Child care centers have the opportunity to provide a mealtime environment that is supportive of the development of healthful eating habits and attitudes toward food. The About Feeding Children Study (12) surveyed licensed child care center directors and staff from California, Colorado, Idaho and Nevada regarding their centers' child-feeding routines and practices. Only 38% (n=154) of centers utilized family style meal service for preschoolers, allowing children to serve themselves and learn how to self-regulate food intake. Staff at centers that served preschoolers family style were more likely to talk with children about food (95%, $P<0.001$) than were staff at centers that used preplated (79%) or lunch box (77%) foodservice. Role modeling for acceptance of new foods was also significantly more prevalent at centers that utilized family style meal service ($P<0.001$), with 69% of staff always trying new foods with children as compared with 40% with preplated and 42% with lunch box service. This study concluded that more needs to be done to educate child care centers regarding the importance of mealtime environments.

1.2 Physical Activity Level of Preschool Age Children in Child Care Settings

Research into the physical activity levels of children in child care suggests the child care environment has considerable influence on children's activity level. In two separate studies, Pate and colleagues (13, 14) evaluated the physical activity levels of preschool children while in child care and examined the relationship between activity level and child care center attended. One study utilized accelerometry to measure activity level and frequency (13). Each child in this study was outfitted with an Actigraph activity monitor worn on a belt. This device collected data on the child's activity level every 15 seconds. The other study (14) utilized the Observational System for Recording Physical Activity in Children - Preschool Version which assesses physical activity type, level, and social and nonsocial environment. Both studies suggested that preschool children were physically inactive during most of their time in child care. Accelerometry data demonstrated that children were engaged in moderate-to-vigorous activity (MVPA) only 13% of the time monitored (13). Children who participated in the direct observation study were engaged in MVPA only 3.4% of the time observed. Both studies revealed that children's activity levels were highly variable among child care centers. Regression analysis of the accelerometry data suggested that specific preschool attended accounted for 43.3% of the variability in (MVPA) levels (13), and direct observation data demonstrated that 27% of the variability in activity levels could be attributed to preschool attended (14).

Bower and colleagues (15) utilized a modified version of the direct observation system employed by Pate et al. (14) to evaluate the activity levels of 3 to 5 year olds over the course of two days in 20 different child care centers in North Carolina. The investigators also included an assessment of each child care center's social and physical activity environment conducted by a trained data collector during a day-long observation of the center using the Environment and

Policy Assessment and Observation (EPAO) protocol. Data collected during direct observation of children attending the child care centers indicated that children were physically inactive during most of their time in child care with only 12% of observations being classified as MVPA and 55% classified as sedentary activity. The physical activity policies and environment at the child care center were shown to have a positive correlation with children's physical activity levels. Children attending centers with physical activity subscale scores on the EPAO which were above the median participated in more MVPA than children who attended centers with scores below the median (15% of observations vs. 9%; effect size=1.17). These results clearly indicate the potential positive impact that the child care setting can have in encouraging physical activity in young children.

1.3 Child Care Center Directors and Staff Perceptions of Centers' Nutrition Environment

Child care center directors and staff have the ability to shape the child care center environment so that it promotes the optimal well-being of the children who attend it. A few small investigations have attempted to describe the attitudes and perceptions that influence staff practices and policies at child care centers (16-18). A qualitative study described factors that directly influenced the menus at CACFP participating child care centers in Texas by analyzing information gleaned from center site visits (16). Four factors were found to directly influence the development of the menu: history, program requirements, costs, and staff perceptions of child food preferences. Child care centers that participated in this study (n=3) sometimes had used the same cycle menu for several years and only changed it in response to new requirements or suggestions from day care licensing representatives or CACFP monitors. Staff expressed a belief that children at the center did not like and would not eat vegetables but liked sweets and fried

food. Although observations indicated that children were just as likely to eat food without added fat, staff insisted that children wanted food seasoned with margarine, lard, or bacon. Staff and directors claimed that costs did not influence the quality of food at the center; however, such practices as employing cooks only part time and having teachers prepare breakfast, closely watching supermarket sales in order to restock center shelves, and serving smaller than required portions of food in order to save money were noted by study observers.

The findings of a descriptive study conducted in Nova Scotia, in which child care center menu planners completed a menu planning attitudes and practice questionnaire and submitted center menus for evaluation, also revealed discrepancies between attitudes, self reported practices, and menu characteristics (17). All questionnaire respondents (n=35) indicated that they agreed with the statement, "I will include fresh vegetables on the menu at least once a day"; however, only two out of the 28 centers that submitted menus included fresh vegetables on their menus daily. Even though 79% of menu planners either agreed or strongly agreed with a statement that beans, peas, lentils and other legumes should be served at least four times within a four week time period, only five center menus included these foods during a four-week cycle.

Focus groups conducted with staff (n=29) at child care centers (n=3) in Ontario, Canada revealed that child care center staff perceived several barriers to creating a healthful food environment (18). Staff were asked what challenges they had experienced in supporting children's healthy eating at the child care center. Challenges identified included children's picky eating, parents' encouragement of unhealthy eating, and lack of accessibility to healthy foods for the child care center. Staff also reported employing practices at the center that are inconsistent with expert recommendations for feeding children, such as using dessert to bribe children to eat their meals.

The American Dietetic Association (ADA) issued a position statement outlining best practices for nutrition programs in child care settings (19). This statement recommends that child care center staff receive training in basic principles of child nutrition, creating a mealtime environment that encourages the development of healthy eating habits, and the importance of serving as role models of healthy behaviors. The ADA encourages child care programs to obtain technical consultation from dietetics professionals on a regular basis.

1.4 Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) Program

Even though guidelines such as the ADA's position statement (19) and the Head Start Performance Standards (20) exist, it is difficult to know to what extent child care center staff and administration understand and implement these standards. The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) program was designed in response to the lack of preschool interventions which target the child care nutrition and physical activity environment (21, 22). Formative research involved in the development of NAP SACC included interviews with child care center directors, assistant directors, teachers, and food service staff. Focus groups were held to gain parent perspective. Scientific literature was reviewed for current nutrition and physical activity recommendations and standards regarding child care and children 2 to 5 years old (22).

The NAP SACC intervention consists of a child care center nutrition and physical activity self assessment questionnaire, center-selected areas for improvement, development of an action plan, continuing education workshops for center staff, targeted technical assistance, and a follow-up self assessment after the program is completed (22). The program was designed to be implemented within the existing public health infrastructure over a six month period of time. A

self assessment approach was utilized for this program in order to inspire voluntary cooperation from child care centers in improving their nutrition and physical activity environment without fear of repercussion from an outside reviewer.

Results of the pilot test of this project suggested that it would be feasible to implement and that it would be accepted by child care centers (21). The main outcome measure of the pilot study was the post-implementation NAP SACC self assessments. The 15 intervention centers in the pilot study rated themselves higher overall on the NAP SACC at post intervention. Since the pilot study, an environment and policy assessment and observation (EPAO) instrument has been developed for use with the NAP SACC program (23). The EPAO utilizes direct observation of the child care center by a trained observer as well as document review at the child care center. The results of reliability and validity testing of the NAP SACC instrument employing the EPAO as a comparison for criterion validity do not recommend the use of the NAP SACC instrument as a measure of program impact (24).

An evaluation of the NAP SACC program conducted in 2005 and 2006 used the EPAO to measure program impact (25). This study included 56 intervention and 26 control child care centers. No significant pre to post change in EPAO scores was noted when utilizing intention-to-treat analysis. However, a significant improvement in EPAO nutrition scores was observed when as-per-protocol analysis was used. There was no significant change in EPAO physical activity scores in either type of analysis. Researchers postulated that the lack of significant findings could be related to limitations of the EPAO as an outcome measure. They also theorized that using a self assessment and self selection of improvement areas by directors may have resulted in a “low demand” intervention. The authors note that the benefits of the NAP SACC program are that it was designed as a low-cost and easy to implement intervention (25). The NAP SACC instrument

itself may serve as a mini-intervention because it outlines best practice for nutrition and physical activity in child care centers (24).

Chapter II

Research Questions and Hypotheses

2.1 Purpose of Study

As part of an *Eat Well Play Hard in Child Care Settings* (EWPHCCS) project administered through the New York State Department of Health, a selection of CACFP child care centers completed the NAP SACC questionnaire before and after participating in the EWPHCCS program. The purpose of this study was to describe the results of child care centers' pre-intervention self assessments in relationship to the centers' selected targeted areas for improvement. Self assessment ratings were compared for Head Start versus non-Head Start centers as well as on-site versus off-site meal preparation. Also, changes in pre and post intervention scores were evaluated.

2.2 Research Questions

This study was designed to investigate the following research questions:

1. How do child care center directors rate their center's nutrition and physical activity environment at pre intervention?
2. What is the relationship between child care center directors' ratings of the center's nutrition and physical activity environment and their selection of a targeted area to improve upon?
3. What proportion of areas to improve upon ratings stayed the same, increased, and decreased at post intervention?
4. What is the relationship between Head Start Center status and the child care center nutrition and physical activity environment?

5. What is the difference between the child care center nutrition environment at centers that prepare meals on-site versus those with off-site meal preparation?
6. Was there a statistically significant improvement in center NAP SACC ratings on any individual NAP SACC items at post intervention?

2.3 Hypotheses

The study hypothesized that:

1. Child care center directors would rate their center's nutrition and physical activity environment relatively high.
2. Child care center directors would select targeted areas to improve upon that they had rated low on the center's NAP SACC instrument.
3. A majority of areas of improvement would have an increased score at post intervention.
4. Head Start Centers would more closely approach best practice on more nutrition and physical activity NAP SACC items than non-Head Start Centers.
5. Centers that prepare meals on-site would more closely approach best practice on nutrition NAP SACC items than centers that had meals prepared off-site.
6. There would be a statistically significant improvement in center NAP SACC ratings on at least some individual NAP SACC items at post intervention.

Chapter III

Methods

3.1 Source of Data

This study utilized the results of a self assessment instrument completed by child care center directors between July 2006 and August 2008 as part of *Eat Well Play Hard in Child Care Settings* (EWPHCCS). EWPHCCS is a project funded through the New York State Department of Health (NYSDOH), Division of Nutrition (DON), Child and Adult Care Food Program (CACFP). It provides nutrition education, obesity prevention and physical activity interventions at CACFP child care centers in New York State where at least 50% of the enrolled children are eligible for free or reduced price meals. During federal fiscal years 2006, 2007 and 2008, the interventions were conducted by registered dietitians (RDs) and included two required trainings for child care center staff, as well as six lessons conducted with pre-school children, and six lessons conducted with parents. Prior to implementation, child care center staff completed the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) questionnaire (Appendix) (26). A post-implementation self assessment of the nutrition and physical activity practices at the center was also collected using the same NAP SACC instrument.

Pre and post EWPHCCS intervention NAP SACC questionnaire data that had been received and entered by NYSDOH, DON, Child and Adult Care Food Program by August 2008 were provided in the form of an Excel spreadsheet. NAP SACC data from centers that did not return both a pre and post intervention questionnaire were not included in this study. Select demographic data for child care centers included in the study were also made available by CACFP. These data included whether or not the center was a Head Start center, the center's

license capacity, on or off site meal preparation, and percentage of enrolled children who were eligible for free or reduced price meals.

3.2 NAP SACC Instrument

The NAP SACC instrument was developed as a self administered evaluation tool that assists child care center staff in evaluating their center's nutrition and physical activity environment and policies (22). The instrument consists of 56 individual items grouped into two sections. Section I consists of nine nutrition areas of focus (Fruits and Vegetables; Fried Foods and High Fat Meats; Beverages; Menus and Variety; Meals and Snacks; Foods Offered Outside of Regular Meals and Snacks; Supporting Healthy Eating; Nutrition Education for Children, Parents, and Staff; and Nutrition Policy), and Section II addresses six physical activity areas of focus (Active Play and Inactive Time; TV Use and TV Viewing; Play Environment; Supporting Physical Activity; Physical Activity Education for Children, Parents, and Staff; and Center Physical Activity Policy). The individual NAP SACC items within each area of focus were based on factors that are believed to have a relationship to childhood overweight (22). Each item has four possible response categories with the left hand column responses representing the minimum standard and the right hand column representing best practice.

Section III of the NAP SACC instrument was included in the EWPHCCS project for the pre-intervention questionnaire only. In this section, child care center directors could indicate up to two NAP SACC areas they would like to target for improvement by writing in the corresponding area number from Sections I and/or II. For example, if the center director wrote in N1 (i.e. nutrition section, area of focus 1), this would indicate a desire to improve in the area of

Fruits and Vegetables. A space was also provided where center directors could provide a free-text description of the area(s) they had indicated as wanting to improve.

EWPHCCS RDs were expected to instruct center staff on the completion of the NAP SACC questionnaire prior to initiation of the intervention. Completed questionnaires were to be collected during the pre-implementation phase of the intervention. Following complete implementation of the intervention, project RDs were instructed to distribute and collect post-intervention NAP SACC questionnaires. No specific deadline for completing the questionnaire was provided, and there was no prescribed protocol for collection of the questionnaires. Questionnaires could be mailed or faxed to project RDs, or project RDs could pick up the questionnaires in-person from the centers.

3.3 EWPHCCS Project

The staff education portion of the EWPHCCS program consisted of two required staff trainings selected from the NAP SACC project's curriculum of four continuing education workshops: childhood overweight, healthy eating for children, physical activity for children, and personal health and wellness (22). Project RDs were provided with a NAP SACC resource manual to use as an aid in providing centers with technical assistance in improving the center nutrition and physical activity environment. This targeted technical assistance was provided at the discretion of the project RD in consultation with the center directors.

EWPHCCS also featured six nutrition and physical activity lessons delivered to pre-school children as well as six linked nutrition and physical activity lessons delivered to parents. The lessons were chosen from a curriculum of ten lessons developed by the New York State Department of Health (NYSDOH), Division of Nutrition (DON), Child and Adult Care Food

Program (CACFP). The lessons were conducted at the child care centers. All lessons for children included an in-the-classroom component and a take-home activity which reinforced the lesson. Lessons for children were an average of 15 to 30 minutes long. Parent lessons were held at times convenient for parents, including during the evening, and were an average length of 30 to 45 minutes. Notification and recruitment for parent lessons was the responsibility of the child care center. All parent lessons included an overview of the importance of a healthy diet, a discussion of ways to incorporate nutrition changes without spending more money, and safe food handling. Food demonstrations and sampling also were a part of each parent lesson. Child care center teachers were present during the lessons for children, and center directors and staff were allowed to attend the lessons for parents and children.

3.4 Data Analysis

Each of the four possible response categories for individual NAP SACC items was assigned a point value of 1, 2, 3 or 4. Column one responses represent the minimum standard and were assigned 1 point. Column two responses received 2 points; column three responses, 3 points; and column four responses which represent best practice received 4 points. Multiple responses were recorded as non-responses.

Pre-intervention frequencies were calculated for all four response categories for each item on the NAP SACC. Responses were then recoded into two categories with 1 and 2 point responses defined as "low" and 3 and 4 point responses defined as "high." Frequencies were re-calculated based on these two response categories. Statistical significance of associations between Head Start versus non-Head Start status as well as on-site versus off-site meal preparation and high versus low point responses to NAP SACC items was assessed by the χ^2 test

for independence with Yates' Continuity Correction with a P value of <0.05 (27). Associations between Head Start status and high versus low point responses were determined for both nutrition and physical activity NAP SACC items, while associations for on-site versus off-site meal preparation were analyzed for nutrition NAP SACC items only.

Frequencies also were calculated for centers' self-identified NAP SACC areas for improvement as indicated in Section III of the NAP SACC pre intervention instrument. Pre intervention score frequencies for areas to improve upon were generated as well as frequencies of areas to improve upon scores that either stayed the same, increased, or decreased at post-intervention. The mean of individual NAP SACC item scores were calculated when centers indicated a general area of focus as their area to improve upon. For example, if a center indicated that it wanted to improve in NAP SACC area N1 Fruits and Vegetables, that center's pre and post intervention scores were determined by calculating the mean of its scores on the individual NAP SACC items N1A through N1F.

Pre and post intervention scores for all NAP SACC items with pairwise deletion were compared individually using the nonparametric Wilcoxon signed rank test (28). All analyses were performed using the Statistical Package for the Social Sciences (SPSS, version 16.0 for Mac, 2007, SPSS Inc., Chicago, IL). This study was based on analysis of secondary data and was exempt from institutional review board examination.

Chapter IV

Results

4.1 Sample Description

Data for 157 pre intervention and 140 post intervention NAP SACC assessment tools were provided. From this sample, 125 centers had completed both a pre and a post intervention questionnaire, resulting in a final sample of questionnaires from 125 child care centers. Seventy-nine percent of the child care centers (n=99) prepared meals on site. The remaining centers had some form of off site meal preparation which included preparation by an outside vendor or a central kitchen. Forty-percent (n=50) of facilities were Head Start centers. The mean licensed capacity was 65 children (standard deviation ± 40) with a minimum of 8 and a maximum of 210. The mean percentage of enrolled children eligible for free or reduced price meals was 89% (standard deviation ± 16%).

Several pre and post intervention NAP SACC instruments were not complete. Many centers failed to respond to some items on the questionnaire and some checked more than one response, which was recorded as a non-response for analysis. Seventy-eight centers (62.4%) completed all 56 NAP SACC items on the pre intervention questionnaire, and 72 (57.6%) post intervention questionnaires were complete. The number of missing items on the pre intervention questionnaire ranged from 0 to 10 items per child care center, and on the post intervention, it ranged from 0 to 17 items.

4.2 Pre Intervention NAP SACC Ratings

Complete frequencies for all pre intervention NAP SACC items are given based on four response categories in Table 1 and two combined response categories in Table 2. Response rates

Table 1 Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) Instrument pre-intervention: four response categories[a]

Self Assessment Item (total responding)	1-point	2-points	3-points	4-points
Nutrition	←	*n (%)*		→
N1A. Fruit (not juice) (123)	11 (8.9)	21 (17.1)	23 (18.7)	68 (55.3)
N1B. Fresh, frozen, or canned in juice fruit (124)	1 (0.8)	11 (8.9)	34 (27.4)	78 (62.9)
N1C. 100% fruit juice (122)	18 (14.8)	31 (25.4)	51 (41.8)	22 (18)
N1D. Vegetables (not including fried potatoes) (122)	6 (4.9)	33 (27)	64 (52.5)	19 (15.6)
N1E. Dark green, red, orange, or yellow vegetables (124)	5 (4)	6 (4.8)	59 (47.6)	54 (43.5)
N1F. Vegetables and added fat (121)	7 (5.8)	5 (4.1)	21 (17.4)	88 (72.7)
N2A. Fried or pre-fried meats (124)	0 (0)	3 (2.4)	39 (31.5)	82 (66.1)
N2B. Fried or pre-fried potatoes (122)	0 (0)	2 (1.6)	25 (20.5)	95 (77.9)
N2C. High fat meats (124)	1 (0.8)	4 (3.2)	39 (31.5)	80 (64.5)
N2D. Lean meats (123)	18 (14.6)	50 (40.7)	43 (35)	12 (9.8)
N3A. Outdoor drinking water (125)	33 (26.4)	24 (19.2)	36 (28.8)	32 (25.6)
N3B. Indoor drinking water (124)	1 (0.8)	16 (12.9)	41 (33.1)	66 (53.2)
N3C. Sugar-sweetened beverages (118)	3 (2.5)	9 (7.6)	2 (1.7)	104 (88.1)
N3D. Type of milk for children ages 2 and older (123)	1 (0.8)	32 (26)	83 (67.5)	7 (5.7)
N3E. Soft-drink vending machines (122)	6 (4.9)	10 (8.2)	20 (16.4)	86 (70.5)
N4A. Cycle menu length (124)	22 (17.7)	6 (4.8)	16 (12.9)	80 (64.5)
N4B. Whole-grain, high fiber (125)	10 (8)	64 (51.2)	16 (12.8)	35 (28)
N4C. Introduction of new foods (125)	11 (8.8)	49 (39.2)	43 (34.4)	22 (17.6)
N4D. Foods from other cultures (124)	24 (19.4)	66 (53.2)	24 (19.4)	10 (8.1)
N5A. Satiety (121)	17 (14)	20 (16.5)	28 (23.1)	56 (46.3)
N5B. Hunger (122)	22 (18)	22 (18)	44 (36.1)	34 (27.9)
N5C. Encouraging children to eat (124)	0 (0)	7 (5.6)	31 (25)	86 (69.4)
N5D. Sweets, high fat, high salt (118)	1 (0.8)	3 (2.5)	20 (16.9)	94 (79.7)
N5E. Food as reward (122)	0 (0)	0 (0)	4 (3.3)	118 (96.7)
N5F. Food used to control behavior (122)	0 (0)	0 (0)	0 (0)	122 (100)
N6A. Parent guidelines for holidays or celebrations (115)	25 (21.7)	30 (26.1)	11 (9.6)	49 (42.6)
N6B. Holidays and celebrations (116)	18 (15.5)	32 (27.6)	41 (35.3)	25 (21.6)
N6C. Fundraising (105)	41 (39)	23 (21.9)	23 (21.9)	18 (17.1)
N7A. Children and staff sit together for meals (124)	3 (2.4)	8 (6.5)	18 (14.5)	95 (76.6)
N7B. Meals served family style (124)	11 (8.9)	15 (12.1)	15 (12.1)	83 (66.9)
N7C. Staff consume the same foods and drinks as children (124)	3 (2.4)	13 (10.5)	25 (20.2)	83 (66.9)
N7D. Staff consume less healthy foods in front of children (123)	1 (0.8)	1 (0.8)	19 (15.4)	102 (82.9)
N7E. Staff talk with children about healthy foods (124)	10 (8.1)	14 (11.3)	34 (27.4)	66 (53.2)
N8A. Training opportunities on nutrition for staff (123)	11 (8.9)	7 (5.7)	44 (35.8)	61 (49.6)
N8B. Nutrition training provided by qualified professional (124)	20 (16.1)	33 (26.6)	23 (18.5)	48 (38.7)
N8C. Staff provide nutrition education for children (123)	16 (13)	35 (28.5)	29 (23.6)	43 (35)
N8D. Nutrition education offered to parents (124)	34 (27.4)	18 (14.5)	27 (21.8)	45 (36.3)
N9A. Written policy on nutrition and food service (109)	16 (14.7)	3 (2.8)	12 (11)	78 (71.6)
Physical Activity	←	*n (%)*		→
PA1A. Active (free) play time (125)	11 (8.8)	34 (27.2)	36 (28.8)	44 (35.2)
PA1B. Structured physical activity (124)	4 (3.2)	10 (8.1)	21 (16.9)	89 (71.8)
PA1C. Outdoor active play (124)	2 (1.6)	8 (6.5)	64 (51.6)	50 (40)
PA1D. PA as punishment (121)	1 (0.8)	31 (25.6)	69 (57)	20 (16.5)
PA1E. Sedentary time (116)	8 (6.9)	3 (2.6)	6 (5.2)	99 (85.3)
PA2A. Presence of television (118)	1 (0.8)	0 (0)	4 (3.4)	113 (95.8)
PA2B. TV, videos, video games (115)	0 (0)	4 (3.5)	2 (1.7)	109 (94.8)
PA3A. Fixed play equipment (123)	13 (10.6)	4 (3.3)	45 (36.6)	61 (49.6)
PA3B. Equipment safety checks (109)	2 (1.8)	6 (5.5)	33 (30.3)	68 (62.4)
PA3C. Portable play equipment (122)	6 (4.9)	20 (16.4)	48 (39.3)	48 (39.3)
PA3D. Indoor play space (124)	1 (0.8)	15 (12.1)	46 (37.1)	62 (50)
PA4A. Staff join in active play (125)	4 (3.2)	31 (24.8)	32 (25.6)	58 (46.4)
PA4B. Support for PA (123)	14 (11.4)	48 (39)	30 (24.4)	31 (25.2)
PA5A. Training opportunities for PA for staff (124)	33 (26.6)	11 (8.9)	56 (45.2)	24 (19.4)
PA5B. PA training by qualified professional (124)	48 (38.7)	12 (9.7)	47 (37.9)	17 (13.7)
PA5C. Staff provide PA education for children (120)	17 (14.2)	25 (20.8)	20 (16.7)	58 (48.3)
PA5D. PA education offered to parents (122)	66 (54.1)	16 (13.1)	23 (18.9)	17 (13.9)
PA6A. Written policy on PA (109)	52 (47.7)	5 (4.6)	5 (4.6)	47 (43.1)

[a.] 1 point=minimal standard, 2 points=fair, 3 points=good, 4 points=best practice

Table 2 Nutrition and Physical Activity Self-Assessment for Child Care(NAP SACC) Instrument pre-intervention low and high point value response categories[a]

Self Assessment Item (total responding)	Low Point Value Response	High Point Value Response
Nutrition	*n (%)*	
N1A. Fruit (not juice) (123)	31 (26)	91 (74)
N1B. Fresh, frozen, or canned in juice fruit (124)	12 (9.7)	112 (90.3)
N1C. 100% fruit juice (122)	49 (39.2)	73 (59.8)
N1D. Vegetables (not including fried potatoes) (122)	39 (32)	83 (68)
N1E. Dark green, red, orange, or yellow vegetables (124)	11 (8.9)	113 (91.1)
N1F. Vegetables and added fat (121)	12 (9.9)	109 (90.1)
N2A. Fried or pre-fried meats (124)	3 (2.4)	121 (97.6)
N2B. Fried or pre-fried potatoes (122)	2 (1.6)	120 (98.4)
N2C. High fat meats (124)	5 (4)	119 (96)
N2D. Lean meats (123)	68 (55.3)	55 (44.7)
N3A. Outdoor drinking water (125)	57 (45.6)	68 (54.4)
N3B. Indoor drinking water (124)	17 (13.7)	107 (86.3)
N3C. Sugar-sweetened beverages (118)	12 (10.2)	106 (89.8)
N3D. Type of milk for children ages 2 and older (123)	33 (26.8)	90 (73.2)
N3E. Soft-drink vending machines (122)	16 (13.1)	106 (86.9)
N4A. Cycle menu length (124)	28 (22.6)	96 (77.4)
N4B. Whole-grain, high fiber (125)	74 (59.2)	51 (40.8)
N4C. Introduction of new foods (125)	60 (48)	65 (52)
N4D. Foods from other cultures (124)	90 (72.6)	34 (27.4)
N5A. Satiety (121)	37 (30.6)	84 (69.4)
N5B. Hunger (122)	44 (36.1)	78 (63.9)
N5C. Encouraging children to eat (124)	7 (5.6)	117 (94.4)
N5D. Sweets, high fat, high salt (118)	4 (3.4)	114 (96.6)
N5E. Food as reward (122)	0 (0)	122 (100)
N5F. Food used to control behavior (122)	0 (0)	122 (100)
N6A. Parent guidelines for holidays or celebrations (115)	55 (47.8)	60 (52.2)
N6B. Holidays and celebrations (116)	50 (43.1)	66 (56.9)
N6C. Fundraising (105)	64 (61)	41 (39)
N7A. Children and staff sit together for meals (124)	11 (8.9)	113 (91.1)
N7B. Meals served family style (124)	26 (21)	98 (79)
N7C. Staff consume the same foods and drinks as children (124)	16 (12.9)	108 (87.1)
N7D. Staff consume less healthy foods in front of children (123)	2 (1.6)	121 (98.4)
N7E. Staff talk with children about healthy foods (124)	24 (19.4)	100 (80.6)
N8A. Training opportunities on nutrition for staff (123)	18 (14.6)	105 (85.4)
N8B. Nutrition training provided by qualified professional (124)	53 (42.7)	71 (57.3)
N8C. Staff provide nutrition education for children (123)	51 (41.5)	72 (58.5)
N8D. Nutrition education offered to parents (124)	52 (41.9)	72 (58.1)
N9A. Written policy on nutrition and food service (109)	19 (17.4)	90 (82.6)
Physical Activity	*n (%)*	
PA1A. Active (free) play time (125)	45 (36)	80 (64)
PA1B. Structured physical activity (124)	14 (11.3)	110 (88.7)
PA1C. Outdoor active play (124)	10 (8.1)	114 (91.9)
PA1D. PA as punishment (121)	32 (26.4)	89 (73.6)
PA1E. Sedentary time (116)	11 (9.5)	105 (90.5)
PA2A. Presence of television (118)	1 (0.8)	117 (99.2)
PA2B. TV, videos, video games (115)	4 (3.5)	111 (96.5)
PA3A. Fixed play equipment (123)	17 (13.8)	106 (86.2)
PA3B. Equipment safety checks (109)	8 (7.3)	101 (92.7)
PA3C. Portable play equipment (122)	26 (21.3)	96 (78.7)
PA3D. Indoor play space (124)	16 (12.9)	108 (87.1)
PA4A. Staff join in active play (125)	35 (28)	90 (72)
PA4B. Support for PA (123)	62 (50.4)	61 (49.6)
PA5A. Training opportunities for PA for staff (124)	44 (35.5)	80 (64.5)
PA5B. PA training by qualified professional (124)	60 (48.4)	64 (51.6)
PA5C. Staff provide PA education for children (120)	42 (35)	78 (65)
PA5D. PA education offered to parents (122)	82 (67.2)	40 (32.8)
PA6A. Written policy on PA (109)	57 (52.3)	52 (47.7)

[a.] low=1 point and 2 points responses, high=3 points and 4 points responses

for individual NAP SACC items ranged from 105 to 125. Percentages given are based on the valid percent for each item. Child care centers rated themselves high overall on most NAP SACC items, selecting either a 3 or 4 point value response (mean=3.1, median=3, mode=4). All centers responding to item N5F (n=122) indicated that they never use food to control behavior or withhold it as punishment, and only four out of 122 (3.3%) centers indicated that they ever use food as a reward. Other areas where a large majority of centers indicated utilizing best practice included N7D staff consumption of less healthful food in front of children (n=102), N3C serving sugar-sweetened beverages (n=104), and PA2A and PA2B use of TV and screen time (n=113 and n=109 respectively).

There were four nutrition items on which the majority of child care centers scored themselves low. Out of 123 centers that completed item N2D "Lean meats (baked or broiled chicken, turkey, or fish) are served," 55.3% (n=68) indicated either "less than once per week" or "1-2 times per week." Seventy-four out of 125 centers (59.2%) indicated on item N4B that they only serve whole grain foods 2-4 times per week or less, and 90 out of 124 centers (72.6%) indicated on item N4D that weekly menus include foods from other cultures either only "some of the time" or "rarely or never." NAP SACC results also revealed a greater frequency of low self assessment scores of either 1 or 2 points on three physical activity items: PA4B presence of posters supporting physical activity (n=62, 50.4%), PA5D physical activity education for parents (n=82, 67.2%), and PA6A the use of a child care center physical activity policy (n=57, 52.3%).

4.3 Associations of Center Characteristics with Pre Intervention NAP SACC Ratings

Table 3 summarizes results of cross-tabulations and χ^2 test of independence for Head Start (n=50, 40%) versus non-Head Start (n=75, 60%) status and ratings on nutrition and

Table 3 Comparison of Head Start and non-Head Start centers: low and high self-assessment rating by individual NAP SACC item

Self Assessment Item (total responding)	Head Start (N=50)		Non-Head Start (N=75)		*P* value[b]
	Low	High	Low	High	
Nutrition	← *n (%)*[a] →		← *n (%)*[a] →		
N1A. Fruit (not juice) (123)	14 (28.6)	35 (71.4)	18 (24.3)	56 (75.7)	0.752
N1B. Fresh, frozen, or canned in juice fruit (124)	4 (8.2)	45 (91.8)	8 (10.7)	67 (89.3)	0.881
N1C. 100% fruit juice (122)	12 (24.5)	37 (75.5)	37 (50.7)	36 (49.3)	0.007*
N1D. Vegetables (not including fried potatoes) (122)	16 (32.7)	33 (67.3)	23 (31.5)	50 (68.5)	1.000
N1E. Dark green, red, orange, or yellow vegetables (124)	3 (6)	47 (94)	8 (10.8)	66 (89.2)	0.547
N1F. Vegetables and added fat (121)	4 (8.2)	45 (91.8)	8 (11.1)	64 (88.9)	0.824
N2A. Fried or pre-fried meats (124)	0 (0)	50 (100)	3 (4.1)	71 (95.9)	0.398
N2B. Fried or pre-fried potatoes (122)	0 (0)	49 (100)	2 (2.7)	71 (97.3)	0.659
N2C. High fat meats (124)	1 (2)	48 (98)	4 (5.3)	71 (94.7)	0.657
N2D. Lean meats (123)	29 (58)	21 (42)	39 (53.4)	34 (46.6)	0.751
N3A. Outdoor drinking water (125)	29 (58)	21 (42)	28 (37.3)	47 (62.7)	0.037*
N3B. Indoor drinking water (124)	7 (14)	43 (86)	10 (13.5)	64 (86.5)	1.000
N3C. Sugar-sweetened beverages (118)	6 (12.5)	42 (87.5)	6 (8.6)	64 (91.4)	0.701
N3D. Type of milk for children ages 2 and older (123)	4 (8.2)	45 (91.8)	29 (39.2)	45 (60.8)	<0.001*
N3E. Soft-drink vending machines (122)	7 (14.6)	41 (85.4)	9 (12.2)	65 (87.8)	0.910
N4A. Cycle menu length (124)	5 (10.2)	44 (89.8)	23 (30.7)	52 (69.3)	0.014*
N4B. Whole-grain, high fiber (125)	32 (64)	18 (36)	42 (56)	33 (44)	0.480
N4C. Introduction of new foods (125)	19 (38)	31 (62)	41 (54.7)	34 (45.3)	0.100
N4D. Foods from other cultures (124)	38(77.6)	11 (22.4)	52 (69.3)	23 (30.7)	0.425
N5A. Satiety (121)	12 (25)	36 (75)	25 (34.2)	48 (65.8)	0.380
N5B. Hunger (122)	15 (30.6)	34 (69.4)	29 (39.7)	44 (60.3)	0.403
N5C. Encouraging children to eat (124)	0 (0)	50 (100)	7 (9.5)	67 (90.5)	0.065
N5D. Sweets, high fat, high salt (118)	0 (0)	48 (100)	4 (5.7)	66 (94.3)	0.243
N5E. Food as reward (122)	0 (0)	49 (100)	0 (0)	73 (100)	†
N5F. Food used to control behavior (122)	0 (0)	49 (100)	0 (0)	73 (100)	†
N6A. Parent guidelines for holidays or celebrations (115)	18 (40.9)	26 (59.1)	37 (52.1)	34 (47.9)	0.329
N6B. Holidays and celebrations (116)	13 (29.5)	31 (70.5)	37 (51.4)	35 (48.6)	0.035*
N6C. Fundraising (105)	19 (51.4)	18 (48.6)	45 (66.2)	23 (33.8)	0.201
N7A. Children and staff sit together for meals (124)	1 (2)	49 (98)	10 (13.5)	64 (86.5)	0.059
N7B. Meals served family style (124)	1 (2)	49 (98)	25 (33.8)	49 (66.2)	<0.001*
N7C. Staff consume the same foods and drinks as children (124)	1 (2)	49 (98)	15 (20.3)	59 (79.7)	0.007*
N7D. Staff consume less healthy foods in front of children (123)	2 (4.1)	47 (95.9)	0 (0)	74 (100)	0.308
N7E. Staff talk with children about healthy foods (124)	5 (10)	45 (90)	19 (25.7)	55 (74.3)	0.053
N8A. Training opportunities on nutrition for staff (123)	4 (8.2)	45 (91.8)	14 (18.9)	60 (81.1)	0.164
N8B. Nutrition training provided by qualified professional (124)	16 (32.7)	33 (67.3)	37 (49.3)	38 (50.7)	0.099
N8C. Staff provide nutrition education for children (123)	8 (16.3)	41 (83.7)	43 (58.1)	31 (41.9)	<0.001*
N8D. Nutrition education offered to parents (124)	4 (8.2)	45 (91.8)	48 (64)	27 (36)	<0.001*
N9A. Written policy on nutrition and food service (109)	5 (10.9)	41 (89.1)	14 (22.2)	49 (77.8)	0.198
Physical Activity					
PA1A. Active (free) play time (125)	23 (46)	27 (54)	22 (29.3)	53 (70.7)	0.087
PA1B. Structured physical activity (124)	1 (2)	49 (98)	13 (17.6)	61 (82.4)	0.016*
PA1C. Outdoor active play (124)	6 (12)	44 (88)	4 (5.4)	70 (94.6)	0.324
PA1D. PA as punishment (121)	5 (10.4)	43 (89.6)	27 (37)	46 (63)	0.002*

Table 3 Comparison of Head Start and non-Head Start centers: low and high self-assessment rating by individual NAP SACC item (continued)

Self Assessment Item (total responding)	Head Start (N=50)		Non-Head Start (N=75)		*P* value[b]
	Low	High	Low	High	
Physical Activity	← *n (%)*[a] →		← *n (%)*[a] →		
PA1E. Sedentary time (116)	6 (12.2)	43 (87.8)	5 (7.5)	62 (92.5)	0.584
PA2A. Presence of television (118)	1 (2.2)	45 (97.8)	0 (0)	72 (100)	0.821
PA2B. TV, videos, video games (115)	2 (4.5)	42 (95.5)	2 (2.8)	69 (97.2)	1.000
PA3A. Fixed play equipment (123)	6 (12)	44 (88)	11 (15.1)	62 (84.9)	0.827
PA3B. Equipment safety checks (109)	0 (0)	44 (100)	8 (7.3)	57 (87.7)	0.041*
PA3C. Portable play equipment (122)	13 (27.1)	35 (72.9)	13 (17.6)	61 (82.4)	0.304
PA3D. Indoor play space (124)	6 (12.2)	43 (87.8)	10 (13.3)	65 (86.7)	1.000
PA4A. Staff join in active play (125)	6 (12)	44 (88)	29 (38.7)	46 (61.3)	0.002*
PA4B. Support for PA (123)	20 (40.8)	29 (59.2)	42 (56.8)	32 (43.2)	0.122
PA5A. Training opportunities for PA for staff (124)	19 (38)	31 (62)	25 (33.8)	49 (66.2)	0.772
PA5B. PA training by qualified professional (124)	23 (46)	27 (54)	37 (50)	37 (50)	0.799
PA5C. Staff provide PA education for children (120)	9 (19.1)	38 (80.9)	33 (45.2)	40 (54.8)	0.006*
PA5D. PA education offered to parents (122)	24 (49)	25 (51)	58 (79.5)	15 (20.5)	0.001*
PA6A. Written policy on PA (109)	14 (31.8)	30 (68.2)	43 (66.2)	22 (33.8)	0.001*

[a.] Percentages are based on total responses within each child care center category. Total response rates vary for each item.
[b.] P values are based on the χ^2 test of independence with Yates' Continuity Correction.
* P<0.05
[†] No statistics were computed because values for this item are a constant.

physical activity NAP SACC items. Head Start centers were more likely to rate themselves high with 3 or 4 point responses than non-Head Start centers on several NAP SACC items. There was a significant association between Head Start status and item N1C serving juice that is 100% fruit juice (P=0.007), item N3D serving milk that is low fat or non fat (P<0.001), and item N4A longer cycle menu length (P=0.014). Head Start centers were more likely than non-Head Start centers to indicate that they implemented the following practices "most of the time" or "all of the time": N6B celebrate holidays with mostly healthy food or with non-food treats (P=0.035), N7B serve meals family style (P<0.001), and N7C staff consume the same food and drinks as children (P=0.007).

Head Start centers also more frequently indicated that they provided nutrition (N8C) and physical activity education for children (PA5C) at least 2-3 times per month (P<0.001 and P=0.006 respectively). Head Start centers were more likely to provide nutrition (N8D) and physical activity education to parents (PA5D) than non-Head Start centers (P<0.001 and P=0.001 respectively). Head Start centers tended to indicate that they provided structured physical activity (PA1B) at least 2 to 4 times per week (P=0.016), which was more frequent than non-Head Start centers. Head Start centers also performed safety checks on play equipment (PA3B) more frequently (P=0.041). Head Start centers were more likely to indicate that staff joined children in active play (PA4A) "often" or "always" (P=0.002) and also tended to have and utilize a written policy on physical activity (PA6A) more frequently than non-Head Start centers (P=0.001).

Non-Head Start centers were more likely to indicate that staff restricted active play time as punishment "often" or "sometimes" (PA1D) than Head Start centers (P=0.002). Non-Head

Start centers provided children with better access to outdoor drinking water (N3A) than Head Start centers (P=0.037).

Table 4 presents results of crosstabulations and χ^2 test of independence for on versus off site meal preparation and scores on nutrition NAP SACC items. Significant associations were found between on site meal preparation and frequency of serving vegetables (N1D), lean meats (N2D) and whole grain foods (N4B). Centers with on site meal preparation were more likely to indicate that they served vegetables not including fried potatoes at least once per day (P=0.30), lean meats at least 3 to 4 times per week (P=0.023), and whole-grain foods at least once per day (P=0.022). Centers that prepared meals on site also provided children with easier access to outside drinking water (N3A) (P=0.013).

4.4 Center Identified Areas for Improvement

Section III of the pre intervention NAP SACC instrument instructed centers to select two areas to improve upon. Ninety-nine centers (79.2%) selected two areas for improvement, twelve (9.6%) selected only one area to improve upon, and fourteen (11.2%) centers did not choose any area to improve upon. One hundred and eleven centers (88.8%) identified at least one area for improvement on their pre intervention questionnaire. A total of 210 areas for improvement were identified. Of the 210 areas for self improvement chosen, the majority (n=133, 63.3% of responses) were individual NAP SACC items (ie. N1B "Fruits is served fresh, frozen, or canned in its own juice") as opposed to broader NAP SACC areas of focus (ie. N1 "Fruits and Vegetables") (n=77, 36.7% of responses). The most frequently indicated nutrition areas to improve upon were N8 Nutrition Education for Children, Parents, and Staff (n=19, 9% of responses, 17.1% of responding centers) and N4 Menus and Variety (n=12, 5.7% of responses, 10.8% of responding centers). Physical activity areas to improve upon most often cited were

Table 4 Comparison of on site and off site meal preparation: low and high nutrition section self-assessment rating by individual NAP SACC item

Self Assessment Item (total responding)	On Site Meal Preparation (N=99) Low	On Site Meal Preparation (N=99) High	Off Site Meal Preparation (N=26) Low	Off Site Meal Preparation (N=26) High	*P* value[b]
Nutrition	← *n (%)*[a] →		← *n (%)*[a] →		
N1A. Fruit (not juice) (123)	23 (23.7)	74 (76.3)	9 (34.6)	17 (65.4)	0.382
N1B. Fresh, frozen, or canned in juice fruit (124)	10 (10.1)	89 (89.9)	2 (8)	23 (92)	1.000
N1C. 100% fruit juice (122)	43 (44.8)	53 (55.2)	6 (23.1)	20 (76.9)	0.075
N1D. Vegetables (not including fried potatoes) (122)	26 (26.8)	71 (73.2)	13 (52)	12 (48)	0.030*
N1E. Dark green, red, orange, or yellow vegetables (124)	6 (6.1)	92 (93.9)	5 (19.2)	21 (80.8)	0.089
N1F. Vegetables and added fat (121)	12 (12.5)	84 (87.5)	0 (0)	25 (100)	0.137
N2A. Fried or pre-fried meats (124)	2 (2)	96 (98)	1 (3.8)	25 (96.2)	1.000
N2B. Fried or pre-fried potatoes (122)	1 (1)	95 (99)	1 (3.8)	25 (96.2)	0.898
N2C. High fat meats (124)	3 (3.1)	95 (96.9)	2 (7.7)	24 (92.3)	0.613
N2D. Lean meats (123)	48 (49.5)	49 (50.5)	20 (76.9)	6 (23.1)	0.023*
N3A. Outdoor drinking water (125)	39 (39.4)	60 (60.6)	18 (69.2)	8 (30.8)	0.013*
N3B. Indoor drinking water (124)	12 (12.2)	86 (87.8)	5 (19.2)	21 (80.8)	0.549
N3C. Sugar-sweetened beverages (118)	8 (8.6)	85 (91.4)	4 (16)	21 (84)	0.475
N3D. Type of milk for children ages 2 and older (123)	29 (29.9)	68 (70.1)	4 (15.4)	22 (84.6)	0.217
N3E. Soft-drink vending machines (122)	13 (13.4)	84 (86.6)	3 (12)	22 (88)	1.000
N4A. Cycle menu length (124)	25 (25.5)	73 (74.5)	3 (11.5)	23 (88.5)	0.211
N4B. Whole-grain, high fiber (125)	53 (53.5)	46 (46.5)	21 (80.8)	5 (19.2)	0.022*
N4C. Introduction of new foods (125)	46 (46.5)	53 (53.5)	14 (53.8)	12 (46.2)	0.653
N4D. Foods from other cultures (124)	68 (69.4)	30 (30.6)	22 (84.6)	4 (15.4)	0.194
N5A. Satiety (121)	28 (29.2)	68 (70.8)	9 (36)	16 (64)	0.677
N5B. Hunger (122)	34 (35.4)	62 (64.6)	10 (38.5)	16 (61.5)	0.955
N5C. Encouraging children to eat (124)	5 (5.1)	93 (94.9)	2 (7.7)	24 (92.3)	0.975
N5D. Sweets, high fat, high salt (118)	3 (3.2)	90 (96.8)	1 (4)	24 (96)	1.000
N5E. Food as reward (122)	0 (0)	96 (100)	0 (0)	26 (100)	†
N5F. Food used to control behavior (122)	0 (0)	96 (100)	0 (0)	26 (100)	†
N6A. Parent guidelines for holidays or celebrations (115)	42 (46.2)	49 (53.8)	13 (54.2)	11 (45.8)	0.639
N6B. Holidays and celebrations (116)	43 (47.3)	48 (52.7)	7 (28)	18 (72)	0.135
N6C. Fundraising (105)	52 (59.8)	35 (40.2)	12 (66.7)	6 (33.3)	0.779
N7A. Children and staff sit together for meals (124)	8 (8.2)	90 (91.8)	3 (11.5)	23 (88.5)	0.881
N7B. Meals served family style (124)	23 (23.5)	75 (76.5)	3 (11.5)	23 (88.5)	0.290
N7C. Staff consume the same foods and drinks as children (124)	14 (14.3)	84 (85.7)	2 (7.7)	24 (92.3)	0.574
N7D. Staff consume less healthy foods in front of children (123)	2 (2.1)	95 (97.9)	0 (0)	26 (100)	1.000
N7E. Staff talk with children about healthy foods (124)	21 (21.4)	77 (78.6)	3 (11.5)	23 (88.5)	0.392
N8A. Training opportunities on nutrition for staff (123)	14 (14.3)	84 (85.7)	4 (16)	21 (84)	1.000
N8B. Nutrition training provided by qualified professional (124)	39 (39.4)	60 (60.6)	14 (56)	11 (44)	0.203
N8C. Staff provide nutrition education for children (123)	41 (42.3)	56 (57.7)	10 (38.5)	16 (61.5)	0.900
N8D. Nutrition education offered to parents (124)	44 (44.4)	55 (55.6)	8 (32)	17 (68)	0.368
N9A. Written policy on nutrition and food service (109)	16 (18.2)	72 (81.8)	3 (14.3)	18 (85.7)	0.918

[a.] Percentages are based on total responses within each child care center category. Total response rates vary for each item.

[b.] P values are based on the χ^2 test of independence with Yates' Continuity Correction.

* P<0.05

† No statistics were computed because values for this item are a constant.

PA5A Training opportunities for child physical activity for staff (n=45, 21.4% of responses, 40.5% of responding centers) and PA5 Physical Activity Training for Children, Parents, and Staff (n=12, 5.7% of responses, 10.8% of responding centers). Of the 210 areas to improve upon chosen by center directors in Section III of the pre intervention NAP SACC self assessment instrument, 55 (26.2%) were given a 1 point rating, 62 (29.5%) a 2 point rating, 67 (31.9%) a 3 point rating, and 24 (11.4%) a 4 point rating on the pre intervention questionnaire. Complete frequencies for center directors' selected NAP SACC areas to improve upon as well as their corresponding distribution of pre intervention scores are given in Table 5.

Table 6 summarizes pre to post intervention change in NAP SACC scores on areas to improve upon. A total of 205 out of 210 (97.6%) NAP SACC areas to improve upon selected by center directors had scores on both pre and post intervention NAP SACC instruments. Two areas to improve upon were missing pre intervention scores, and three were missing post intervention scores. Of these 205 scores, 21 decreased (10.2%), 89 experienced no change (43.4%), and 95 increased (46.3%) at post intervention.

4.5 Overall NAP SACC Post Intervention Change

A Wilcoxon signed rank test revealed a statistically significant ($P<0.05$) increase in ratings on 11 nutrition and 7 physical activity NAP SACC items (Table 7). Overall, centers reported that they served fried or pre-fried meats and potatoes as well as high fat meats less often at post intervention than at pre. Centers also served lower fat milk, and introduced new foods and foods from other cultures more frequently. Staff talked with children about healthy foods and joined children in active play more often. At post intervention, centers indicated that better

Table 5 Pre-intervention score distribution for center self-selected NAP SACC areas to improve upon (n=210)[a]					
Self Assessment Item or Area of Focus	**# of centers selecting as Area to Improve Upon**	**1-point**	**2-points**	**3-points**	**4-points**
Nutrition	*n (%)*[b]	←	*n*	→	
N1. Fruits and Vegetables[c]	3 (2.7)	0	1	2	0
N1A. Fruit (not juice)	2 (1.8)	0	0	2	0
N1B. Fresh, frozen, or caned in fruit juice	1 (0.9)	0	0	1	0
N1C. 100% fruit juice	1 (0.9)	1	0	0	0
N1F. Vegetables and added fat	1 (0.9)	0	0	1	0
N2. Fried Foods and High Fat Meats[c]	1 (0.9)	0	0	1	0
N2C. High fat meats	1 (0.9)	0	0	0	1
N3A. Outdoor drinking water	5 (4.5)	4	1	0	0
N3B. Indoor drinking water	1 (0.9)	0	1	0	0
N3C. Sugar-sweetened beverages	2 (1.8)	1	1	0	0
N3D.Type of milk for children ages 2 and older	4 (3.6	0	4	0	0
N4. Menus and Variety[c]	12 (10.8)	1	6	5	0
N4B. Whole-grain, high fiber	3 (2.7)	1	1	0	1
N4C. Introduction of new foods	1 (0.9)	1	0	0	0
N4D. Foods from other cultures	5 (4.5)	2	2	1	0
N5. Meals and Snacks[c]	1 (0.9)	0	0	1	0
N5D. Sweets, high fat, high salt	1 (0.9)	0	0	0	1
N6. Foods Offered Outside of Regular Meals and Snacks[c]	7 (6.3)	2	5	0	0
N6A. Parent guidelines for holidays or celebrations	2 (1.8)	1	0	1	0
N6B. Holidays and celebrations	1 (0.9)	0	1	0	0
N6C. Fundraising	1 (0.9)	1	0	0	0
N7. Supporting Healthy Eating[c]	6 (5.4)	0	1	4	1
N7B. Meals served family style	6 (5.4)	1	3	1	1
N8. Nutrition Education for Children, Parents, and Staff[c]	19 (17.1)	4	7	8	0
N8A. Training opportunities on nutrition for staff	4 (3.6)	1	2	0	1
N8C. Staff provide nutrition education for children	2 (1.8)	0	1	0	1
N8D. Nutrition education offered to parents	10 (9)	3	0	4	3
N9 Nutrition Policy	1 (0.9)	1	0	0	0
Physical Activity					
PA1. Active Play and Inactive Time[c]	2 (1.8)	0	0	2	0
PA1A. Active (free) play time	8 (7.2)	1	4	2	1
PA1B. Structured physical activity	4 (3.6)	1	1	2	0
PA3. Play Environment[c]	3 (2.7)	0	1	1	1
PA3A. Fixed play equipment	5 (4.5)	1	1	0	3
PA3B. Equipment safety checks	1 (0.9)	0	0	1	0
PA3C. Portable play equipment	1 (0.9)	0	1	0	0

Table 5 Pre-intervention score distribution for center directors' selected NAP SACC areas to improve upon (n=210)[a] (continued)

Self Assessment Item or Area of Focus	# of Centers Indicating as Area to Improve Upon	1-point	2-points	3-points	4-points
	n (%)[b]	←	*n*		→
PA4A. Staff join in active play	9 (8.1)	1	6	1	1
PA4B. Support for PA	1 (0.9)	0	1	0	0
PA5. Physical Activity Education for Children, Parents, and Staff[c]	12 (10.8)	1	7	4	0
PA5A. Training opportunities for PA for staff	45 (40.5)[d]	15	2	20	7
PA5B. PA training provided by qualified professional	1 (0.9)	0	0	1	0
PA5D. PA education offered to parents	4 (3.6)	3	0	1	0
PA6 Center Physical Activity Policy	10 (9)[e]	7	1	0	1
Total		**55**	**62**	**67**	**24**

[a.] Centers could identify up to 2 areas to improve upon.
[b.] Percentage of centers based on n=111.
[c.] Pre-intervention scores for NAP SACC areas N1, N2, N4, N5, N6, N7, N8, PA1, PA3, & PA5 were calculated by taking the mean score of the individual NAP SACC items in that area. Mean scores less than or equal to 1.5 were classified as 1; scores greater than 1.5 but less than or equal to 2.5 were classified as 2; scores greater than 2.5 but less than or equal to 3.5 were classified as 3; scores greater than 3.5 were classified as 4.
[d.] One center identified item PA5A as an area for improvement but did not rate itself on this item on the pre-intervention questionnaire.
[e.] One center identified item PA6 as an area for improvement but did not rate itself on this item on the pre-intervention questionnaire.

Table 6 NAP SACC areas to improve upon change in score from pre-intervention to post-intervention (n=205)[a]			
NAP SACC Area to Improve Upon	**Decreased score**	**No change**	**Increased score**
Nutrition	←	*n*	→
N1. Fruits and Vegetables[b]	0	0	3
N1A. Fruit (not juice)	0	1	1
N1B. Fresh, frozen, or caned in fruit juice	0	1	0
N1C. 100% fruit juice	0	0	1
N1F. Vegetables and added fat	0	1	0
N2. Fried Foods and High Fat Meats[b]	0	0	1
N2C. High fat meats	0	1	0
N3A. Outdoor drinking water	0	3	2
N3B. Indoor drinking water	0	1	0
N3C. Sugar-sweetened beverages	0	0	2
N3D.Type of milk for children ages 2 and older	0	1	3
N4. Menus and Variety[b]	0	3	9
N4B. Whole-grain, high fiber	2	1	0
N4C. Introduction of new foods	0	0	1
N4D. Foods from other cultures	0	4	1
N5. Meals and Snacks[b]	0	0	1
N5D. Sweets, high fat, high salt	0	1	0
N6. Foods Offered Outside of Regular Meals and Snacks[b]	0	2	5
N6A. Parent guidelines for holidays or celebrations[c]	0	1	0
N6B. Holidays and celebrations	0	1	0
N6C. Fundraising	0	1	0
N7. Supporting Healthy Eating[b]	1	3	2
N7B. Meals served family style	1	3	2
N8. Nutrition Education for Children, Parents, and Staff[b]	3	3	13
N8A. Training opportunities on nutrition for staff	0	3	1
N8C. Staff provide nutrition education for children	0	1	1
N8D. Nutrition education offered to parents	0	6	4
N9 Nutrition Policy[d]	0	0	0
Physical Activity			
PA1. Active Play and Inactive Time[b]	0	0	2
PA1A. Active (free) play time	5	1	2
PA1B. Structured physical activity	1	0	3
PA3. Play Environment[b]	1	2	0
PA3A. Fixed play equipment	0	5	0
PA3B. Equipment safety checks	0	0	1
PA3C. Portable play equipment	0	0	1
PA4A. Staff join in active play[e]	0	5	3

Table 6 NAP SACC area to improve upon change in score from pre-intervention to post-intervention (n=205)[a] (continued)

NAP SACC Area to Improve Upon	Decreased score	No change	Increased score
	← *n* →		
PA4B. Support for PA	0	1	0
PA5. Physical Activity Education for Children, Parents, and Staff[b]	1	4	7
PA5A. Training opportunities for PA for staff[f]	5	23	16
PA5B. PA training provided by qualified professional	0	0	1
PA5D. PA education offered to parents	0	1	3
PA6. Center Physical Activity Policy[g]	1	5	3
Total *n(%)*	**21 (10.2)**	**89 (43.4)**	**95 (46.3)**

[a.] Centers could identify up to 2 areas to improve upon. 210 areas to improve upon were identified at pre intervention. 205 of these had both pre and post intervention ratings.
[b.] Pre to post intervention score change for NAP SACC areas N1, N2, N4, N5, N6, N7, N8, PA1, PA3, & PA5 were calculated by taking the difference between the pre and post intervention mean score of the individual NAP SACC items in that area.
[c.] One center identified item N6A as an area for improvement but did not rate itself on this item on the post-intervention questionnaire.
[d.] One center identified item N9 as an area for improvement but did not rate itself on this item on the post-intervention questionnaire.
[r.] One center identified item PA4A as an area for improvement but did not rate itself on this item on the post-intervention questionnaire.
[f.] One center identified item PA5A as an area for improvement but did not rate itself on this item on the pre-intervention questionnaire.
[g.] One center identified item PA6 as an area for improvement but did not rate itself on this item on the pre-intervention questionnaire.

Table 7 Statistically significant[a] improvements in post intervention NAP SACC instrument ratings

Self Assessment Item	Z score[b] (*P* value)	Negative Ranks	Positive Ranks
Nutrition			
N2A. Fried or pre-fried meats	-1.992 (0.046)	9	21
N2B. Fried or pre-fried potatoes	-2.183 (0.029)	3	11
N2C. High fat meats	-3.615 (<0.001)	7	28
N3A. Outdoor drinking water	-2.866 (0.004)	13	34
N3D. Type of milk for children ages 2 and older	-2.600 (0.009)	5	17
N4C. Introduction of new foods	-2.628 (0.009)	18	37
N4D. Foods from other cultures	-3.428 (0.001)	9	31
N7E. Staff talk with children about healthy foods	-2.548 (0.011)	10	29
N8B. Nutrition training provided by qualified professional	-3.855 (<0.001)	12	38
N8C. Staff provide nutrition education for children	-3.399 (0.001)	11	38
N8D. Nutrition education offered to parents	-4.736 (<0.001)	8	39
Physical Activity			
PA4A. Staff join in active play	-2.127 (0.033)	13	30
PA4B. Support for PA	-3.268 (0.001)	14	37
PA5A. Training opportunities for PA for staff	-4.043 (<0.001)	14	45
PA5B. PA training by qualified professional	-4.098 (<0.001)	11	45
PA5C. Staff provide PA education for children	-2.512 (0.012)	15	31
PA5D. PA education offered to parents	-4.279 (<0.001)	7	34
PA6A. Written policy on PA	-2.833 (0.005)	12	23

[a.] P<0.05 based on Wilcoxon Signed Rank Test.
[b.] Based on negative ranks.

access to outdoor drinking water was provided and that more visible support for physical activity such as posters, pictures and books was displayed. Centers indicated better provision of nutrition and physical activity education and training with NAP SACC scores significantly increasing at post intervention for nutrition training for children and parents, and physical activity training for staff, parents, and children. NAP SACC post intervention scores for training being provided by a qualified professional improved for both nutrition and physical activity. NAP SACC ratings for availability and utilization of a written child care center physical activity policy significantly improved at post intervention. There were no statistically significant overall declines on any NAP SACC items from pre to post intervention.

Chapter V

Discussion

The results of this study add a new dimension to the small existing body of research on the child care nutrition and physical activity environment. This study examined child care centers' self assessments as well as their self-identified areas for improvement. Overall, child care centers rated themselves high on most NAP SACC items. The high scores found in our study in part could be explained by the fact that all of our child care centers participated in the NYSDOH, DON, CACFP, and a large proportion (40%) were Head Start centers.

CACFP provides meal pattern and serving size guidelines for its child care centers for creditable foods, which are reimbursable through CACFP. Although previous studies (5, 8) have shown that CACFP participation does not guarantee best practice, the NYSDOH, DON, CACFP does provide best practice guidelines as part of its crediting foods guide (29). Among these guidelines are indications of foods which are creditable but not recommended, which include such items as cake, brownies, granola bars, cookies, chicken nuggets, cheez wiz, hot dogs, luncheon meats, tator tots, pickles, and flavored milk.

The guide also features *Eat Well Play Hard* recommendations that children over two years old be served low fat (1%) or non fat (skim) milk and that the number of fruits and vegetables served as well as time spent physically active should be increased (29). In our study, only one center reported serving whole milk to children over the age of two years. This differs considerably from study results reported by Ball and colleagues (11) in which more than half of the milk directly observed being consumed by children at child care centers was whole milk.

CACFP's mealtime philosophy, which is also printed in the guide, recommends serving meals family style, having teachers sit with children and eat the same foods as the children,

encouraging children and adults to try new foods, and incorporating multi-cultural foods as much as possible (29). The use of family style meal service in our study was more prevalent than what was reported in a previous study. Survey results from the About Feeding Children Study (12) revealed that only 38% of centers used family style meal service for preschoolers. In contrast, 66.9% (n=83) of centers responding to item N7B (n=124) on the NAP SACC in our study indicated that they serve meals family style "all of the time."

Head Start's Performance Standards (20) for nutrition are similar to New York State CACFP's recommendations. One notable difference between CACFP and Head Start is that Head Start's Performance Standards are requirements that centers must report on to the federal government whereas CACFP's guidelines are mere recommendations. The results of this study indicated a statistically significant association between Head Start status and healthfulness of foods served, which included only serving juice that is 100% fruit juice, serving lean meats, and serving low fat or non fat milk to children over the age of two. The mealtime environment also was closer to ideal at Head Start centers with higher prevalence of family style meal service and staff consuming the same meals as children. Head Start centers provided more nutrition and physical activity education for both children and parents. The federal Head Start program has enforced the integration of these elements as part of its centers' operating philosophy by requiring centers to be accountable and report to Head Start how they are meeting these standards. Several recent studies have noted a general lack of state licensing regulations of child care centers related to practices that could prevent childhood obesity (30-32). These studies urge state policy makers to develop and implement stricter state regulations of nutrition and physical activity practices in child care. Head Start performance standards could serve as a model for states when developing their own guidelines or regulations.

Many centers identified areas for improvement that also received relatively low pre intervention NAP SACC scores. The most frequently identified areas for improvement were PA5 Physical Activity Education for Children, Parents, and Staff and N8 Nutrition Education for Children, Parents, and Staff. The desire for more physical activity education and training corresponds well with the high frequency of centers that rated themselves low in this area, especially for providing education to parents. However, relatively few centers identified a wish to improve in the area of Menus and Variety even though many scored themselves low when it came to the frequency of serving whole grain foods and multi-cultural foods. This may be because the concept of whole grain and multi-cultural foods is relatively new or unfamiliar to them and therefore may not see it as important or necessary to include these items on their menus. Centers may even be unclear as to how whole grain or multi-cultural foods are defined.

A majority of centers identified individual NAP SACC items to improve upon within general areas of focus even though the instrument directed those completing it to indicate an entire area of focus for improvement. Only one center director chose "Nutrition Policy" as an area for improvement. While the original intention of the NAP SACC instrument was to raise awareness in center staff of the importance of the child care center nutrition and physical activity environment (24), the developers of the NAP SACC instrument also have noted in their research that centers tended to select individual items as opposed to entire areas for improvement leading to a "low-demand intervention" and no statistically significant intervention effects when measured using an observational technique (25).

A lack of perceived need for change may hamper efforts to improve nutrition and physical activity in child care. In a recent survey of parents (n=508) of children in child care centers, the majority of respondents rated the quality of meals, snacks and physical activity at the

child care center as either good or excellent (33). Twenty-six percent (n=133) of parents surveyed offered suggestions for improving meals, and only 18% provided recommendations for improving physical activity at child-care centers. This study provided no objective data on the child care nutrition and physical activity environment to either support or refute parents' overall positive perceptions. Therefore, it is difficult to determine whether these child care centers had truly implemented best practice. Whereas parents may play a key role in influencing child care centers to improve their nutrition and physical activity environment; their general satisfaction with the status quo also may prevent them from being advocates of change.

5.1 Limitations

The self administered nature of the NAP SACC instrument was the major limitation of this study. NAP SACC developers have reported that scores for more than two thirds of the questions on the NAP SACC instrument were higher when compared with scores based on observation and document reviews at child care centers (25). While NAP SACC scores on several items in this study showed post intervention improvement, NAP SACC developers strongly caution against using this tool to measure program impact, and results of validity testing of the NAP SACC recommends that a less subjective measure be used (24). Other studies have noted major discrepancies between child care center menus and food actually served (9), as well as between child care center questionnaire results and observations of practices at child care centers (17). These incongruities raise serious questions as to the validity of self assessments for measuring the quality of the child care center nutrition and physical activity environment.

Another limitation is that some of the items on the NAP SACC questionnaire may have been misinterpreted by child care center directors who completed them. A majority of centers

rated themselves low on item N6C "Fundraising consists of selling only non-food items (like wrapping paper, coupon books or magazines: Rarely or never; Some of the time, Most of the time, All of the time." The "All of the time" response indicates best practice. However, it is possible that centers that do not participate in fundraisers at all would have chosen "Rarely or never," a response that would indicate a need for improvement. A large proportion of nonresponses (n=20, 16%) for this item suggest that child care center directors may have been unsure as to how to rate their centers.

Some results generated more questions than answers. This study revealed low reported frequencies of serving fried or pre-fried meats as well as high fat meats. However, a majority of centers also reported a low frequency of serving lean meats. It is unclear exactly what kind of meat was being served. Perhaps centers inaccurately reported how frequently they serve fried, high fat, and lean meats or perhaps they were serving medium fat meats. It is also possible that centers were serving alternatives to meat for this component, such as legumes or cottage cheese. Without observational data, many questions remain as to what food is being served at child care centers.

Chapter VI

Conclusions

The current evaluation adds to the small existing body of research regarding the nutrition and physical activity environment in child care settings. While the majority of participating centers rated themselves high in most NAP SACC areas of focus, more objective evaluations of the child care environment would provide a clearer picture of the current state of affairs. Continued research into reliable and valid methods for evaluating the child care nutrition and physical activity environment is an essential component of childhood obesity prevention efforts. Child care center directors and staff have shown a willingness to provide a healthful environment for those in their care. Even though child care center directors tended to self-select individual NAP SACC items to target for change rather than choosing broader areas for improvement, they also indicated a desire for more education and training in nutrition and physical activity. This may suggest that center directors are reluctant to commit to comprehensive changes without more substantial outside support from experts. More directive and comprehensive interventions conducted by nutrition and physical activity professionals may be more successful than center-directed action plans focusing on small gradual changes.

Appendix

Nutrition And Physical Activity Self-Assessment for Child Care

Your Name: _____ Date: _____

Child Care Center/Home Name: _____

_____

Please read each statement or question carefully and check the response that best fits your child care center or home. Your honest responses will help us work with you to build a healthy nutrition and physical activity environment at your center or home.

SECTION I: NUTRITION

(N1) Fruits and Vegetables				
A. Fruit (not juice) is served:	☐ 2 times per week or less	☐ 3-4 times per week	☐ 1 time per day	☐ 2 or more times per day
B. Fruit is served fresh, frozen, or canned in own juice:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
C. 100% fruit juice is served:	☐ 2 or more times per day	☐ 1 time per day	☐ 2-4 times per week	☐ 1 time per week or less
D. Vegetables (not including french fries or fried potatoes) are served:	☐ 2 times per week or less	☐ 3-4 times per week	☐ 1 time per day	☐ 2 or more times per day
E. Vegetables served are dark green, red, orange, or yellow in color:	☐ Less than 1 time per week	☐ 1-2 times per week	☐ 3-4 times per week	☐ 1 or more times per day
F. Cooked vegetables are prepared with added meat fat, margarine or butter:	☐ 1 or more times per day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than 1 time per week
(N2) Fried Foods and High Fat Meats				
A. Fried or pre-fried meats (chicken nuggets) or fish (fish sticks) are served:	☐ 1 or more times each day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than once a week or never
B. Fried or pre-fried potatoes (french fries, tater tots, hash browns) are served:	☐ 1 or more times each day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than once a week or never
C. High fat meats (sausage, bacon, hot dogs, bologna, ground beef) are served:	☐ 1 or more times each day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than once a week or never

Ammerman, AS, Benjamin, SE, Sommers, JK, Ward, DS. 2004. The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) environmental self-assessment instrument. Division of Public Health, NC DHHS, Raleigh, NC, and the Center for Health Promotion and Disease Prevention, UNC-Chapel Hill, Chapel Hill, NC.

Appendix (continued)

D. Lean meats, (baked or broiled chicken, turkey, or fish) are served:	☐ Less than once a week	☐ 1-2 times per week	☐ 3-4 times per week	☐ 1 or more times per day
(N3) Beverages				
A. Drinking water is available outside:	☐ Not freely available	☐ Available during designated water breaks	☐ Easily visible and available on request	☐ Easily visible and available for self-serve
B. Drinking water is available inside:	☐ Not freely available	☐ Available during designated water breaks	☐ Easily visible and available on request	☐ Easily visible and available for self-serve
C. Sugary drinks (Kool-aid™, sports drinks, sweet tea, punches, soda) other than 100% juice are served:	☐ 1 or more times each day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than one time per week
D. Milk served to children ages 2 and older is usually:	☐ Whole or regular	☐ 2% reduced fat	☐ 1% low-fat	☐ Skim or non-fat
E. Soda and other soft-drink vending machines are located:	☐ In entrance or front of building	☐ In public areas but not entrance	☐ Out of sight of parents and children	☐ No vending machines on site
(N4) Menus and Variety				
A. Menus used are:	☐ 1-week cycle	☐ 2-week cycle	☐ 3-week or more without seasonal change	☐ 3-week or more with seasonal change
B. Menus include whole grain foods that are high in fiber (whole wheat bread, oatmeal, brown rice, Cheerios™):	☐ 1 time per week or less	☐ 2-4 times per week	☐ 1 time per day	☐ 2 or more times per day
C. Weekly menus include a combination of both new and familiar foods:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
D. Weekly menus include foods from a variety of cultures:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
(N5) Meals and Snacks				
A. When children eat less than half of a meal or snack, the staff help determine if they are full before removing plate:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time

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Appendix (continued)

B. When children request seconds, staff help children determine if they are still hungry before serving the requested food:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
C. Children who are picky eaters (able to eat a food but resisting) are encouraged to try new or less favorite food:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
D. Sweets or high fat, high salt foods (cookies, cakes, candy, chips, cheese doodles) are served for snacks:	☐ 1 or more times each day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than one time per week
E. Food is used to reward desired behavior:	☐ All of the time	☐ Most of the time	☐ Some of the time	☐ Rarely or never
F. Food is used to control behavior or withheld as punishment:	☐ All of the time	☐ Most of the time	☐ Some of the time	☐ Rarely or never
(N6) Foods Offered Outside of Regular Meals and Snacks				
A. Guidelines provided to parents for food brought in for holidays or celebrations are:	☐ Not available	☐ Loose guidelines with healthier options encouraged	☐ Written guidelines for healthier options that are not always enforced	☐ Written guidelines for healthier options that are usually enforced
B. Holidays are celebrated with mostly healthy foods or with non-food treats like stickers:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
C. Fundraising consists of selling only non-food items (like wrapping paper, coupon books or magazines):	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
(N7) Supporting Healthy Eating				
A. Children and staff sit down together for meals:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
B. Meals are served family style (children serve themselves with limited help):	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
C. Staff consume the same food and drinks as the children:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time

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D. Staff eat or drink less healthy foods (especially sweets, salty snacks, and sugary drinks) in front of the children:	☐ All of the time	☐ Most of the time	☐ Some of the time	☐ Rarely or never
E. Staff talk with children about trying and enjoying healthy foods:	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
(N8) Nutrition Education for Children, Parents, and Staff				
A. Training opportunities on nutrition are provided for staff:	☐ Rarely or never	☐ Less than 1 time per year	☐ 1 time per year	☐ 2 times per year or more
B. Nutrition training is provided by qualified professional (nurse, registered dietitian, doctor):	☐ Rarely or never	☐ Some of the time	☐ Most of the time	☐ All of the time
C. Staff provide nutrition education for children:	☐ Rarely or never	☐ 1 time per month	☐ 2-3 times per month	☐ 1 time per week or more
D. Nutrition education opportunities are offered to parents (workshops and activities):	☐ Rarely or never	☐ Less than 1 time per year	☐ 1 time per year	☐ 2 times per year or more
(N9) Nutrition Policy				
A. A written policy on nutrition and food service that covers most of the NAP SACC is:	☐ Not available	☐ Available but not followed by most staff	☐ Available but followed only by some staff	☐ Available and routinely followed by all staff

SECTION II: PHYSICAL ACTIVITY

(PA1) Active Play and Inactive Time				
A. Active (free) play time is provided to all children:	☐ 15-30 minutes each day	☐ 31-45 minutes each day	☐ 46-60 minutes each day	☐ More than 60 minutes each day
B. Structured physical activity (teacher-led) is provided to all children:	☐ Less than 1 time per month	☐ 2-4 times per month	☐ 2-4 times per week	☐ Daily
C. Outdoor active play is provided for all children:	☐ 1 time per week or less	☐ 2-4 times per week	☐ 1 time per day	☐ 2 or more times per day

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Appendix (continued)

D. Staff restrict active play time for children who misbehave:	☐ Often	☐ Sometimes	☐ Never	☐ Never and provide more active play time to reward
E. Children are seated (excluding nap time) more than 30 minutes at a time:	☐ 1 or more times each day	☐ 3-4 times per week	☐ 1-2 times per week	☐ Less than one time per week or never
(PA2) TV Use and TV Viewing				
A. Television use consists of the:	☐ TV turned on most of the day, including meal time, everyday	☐ TV turned on for part of the time, most days	☐ TV turned on everyday for part of the time, some days	☐ TV used rarely and only for viewing educational programs
B. Children are allowed to watch TV, videos or play video games:	☐ Throughout the day	☐ Once a day	☐ 2-4 times per week	☐ 1 time per week or less, usually for educational use only
(PA3) Play Environment				
A. Fixed play equipment (swings, slides, climbing equipment, overhead ladders) is:	☐ Unavailable at our site	☐ Swing sets (or one type of equipment) only available	☐ Different equipment available that suits most children	☐ Wide variety of equipment available and accommodates needs of all children
B. Safety checks on equipment occur:	☐ Only when equipment is installed	☐ 1 time per year	☐ 1 time per month	☐ 1 time per week
C. Portable play equipment that stimulates a variety of gross motor skills (wheel toys, balls, tumbling mats) consists of:	☐ Little variety and children must take turns	☐ Some variety but children must take turns	☐ Good variety but children must take turns	☐ Lots of variety for all children to use at the same time
D. When weather is not suitable to go outdoors, indoor play space is available:	☐ For quiet play	☐ For very limited movement (jumping and rolling)	☐ For some active play (jumping, rolling and skipping)	☐ For all activities, including running
(PA4) Supporting Physical Activity				
A. During active (free) play time staff:	☐ Rarely or never join children in active play (mostly sit or stand)	☐ Sometimes join children in active play	☐ Often or always join children in active play	☐ Often or always join children in active play and make positive statements about the activity

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Appendix (continued)

B. Staff show visible support for physical activity by:	☐ No posters, pictures, or books about physical activity displayed	☐ A few posters, pictures, or or books about physical activity displayed in a few rooms	☐ Posters, pictures, or books about physical activity are displayed in most rooms	☐ Posters, pictures, or books about physical activity are displayed in every room
(PA5) Physical Activity Education for Children, Parents, and Staff				
A. Training opportunities are provided for staff in physical activity:	☐ Rarely or never	☐ Less than 1 time per year	☐ 1 time per year	☐ 2 times per year
B. Physical activity training is provided by qualified professional (nurse, athletic trainer, doctor):	☐ Rarely or never	☐ Less than 1 time per year	☐ 1 time per year	☐ 2 times per year
C. Staff provide physical activity education for children:	☐ Rarely or never	☐ 1 time per month	☐ 2-3 times per month	☐ 1 time per week
D. Physical activity education is offered to parents (workshops and activities):	☐ Rarely or never	☐ Less than 1 time per year	☐ 1 time per year	☐ 2 times per year
(PA6) Physical Activity Policy				
A. A written policy on physical activity that covers most of the NAP SACC areas is:	☐ Not available	☐ Available but not followed by most staff	☐ Available but followed only by some staff	☐ Available and routinely followed by all staff

For more information about this self-assessment instrument and the NAP SACC project, please visit http://www.napsacc.org

Please use the following citation when referencing this instrument: Ammerman, AS, Benjamin, SE, Sommers, JK, Ward, DS. 2004. The Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) environmental self-assessment instrument. Division of Public Health, NC DHHS, Raleigh, NC, and the Center for Health Promotion and Disease Prevention, UNC-Chapel Hill, Chapel Hill, NC.

State of North Carolina • Michael F. Easley, Governor | Department of Health and Human Services • Carmen Hooker Odom, Secretary
Division of Public Health • NC Healthy Weight Initiative
Department of Nutrition • UNC Schools of Public Health and Medicine | UNC Center for Health Promotion and Disease Prevention

SECTION III: AREAS TO IMPROVE UPON

The final step in this self-assessment process is for you to look at the information you have recorded and determine two areas you would like to improve upon.

Keep in mind that column one answers indicate practices that most need improvement, and column five answers indicate best practice. Select two areas where your center is not already performing at the top level, so you can strive for measurable improvement.

Please describe the two areas the center would like to improve upon:

1) Area # from NAP SACC Assessment Tool: _____

Brief Description:

2) Area # from NAP SACC Assessment Tool: _____

Brief Description:

Please submit this self-assessment to the Eat Well Play Hard in Child Care Settings Nutritionist who will provide two trainings for center staff which will enhance your efforts to improve the areas that you selected.

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