HEALTHY CHILD CARE GEORGIA: IMPROVING TEACHER MODELING FOR OBESITY PREVENTION BEST PRACTICES

by

HANNAH URBAN

(Under the Direction of Caree Cotwright)

ABSTRACT

Healthy Child Care Georgia (HCCG) is a nutrition and physical activity intervention designed to increase the quality and quantity of nutrition and physical activity education for children in early care and education programs in Georgia. Preschool teachers are potential change agents for combating obesity. Enhancing teacher modeling is desirable, because observational learning is a promising method to influence child nutrition and physical activity behaviors. This mixed methods study investigated barriers preventing teachers from implementing and modeling obesity prevention best practices and policies and evaluated the impact goal setting and coaching had on best practice implementation and modeling and self-efficacy to model healthy habits. Seven barriers were identified. There was significant improvement in teacher implementation and modeling for both nutrition ($Z = -2.220$, 0.026) and physical activity ($Z = -2.060$, $p = 0.039$) practices. Teacher self-efficacy to model healthy nutrition and physical activity behaviors increased only according to the qualitative findings.

INDEX WORDS: Nutrition, physical activity, childhood obesity, obesity prevention, teachers, early care and education

HEALTHY CHILD CARE GEORGIA: IMPROVING TEACHER MODELING FOR OBESITY PREVENTION BEST PRACTICES

by

HANNAH URBAN

B.S., The University of Florida, 2016

A Thesis Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

ATHENS, GEORGIA

2018

HEALTHY CHILD CARE GEORGIA: IMPROVING TEACHER MODELING FOR OBESITY PREVENTION BEST PRACTICES

by

HANNAH URBAN

Major Professor: Caree Cotwright

Committee: Diane Bales
Jori Hall

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
August 2018

ACKNOWLEDGEMENTS

Dr. Caree Cotwright, thank you for your amazing mentorship throughout this journey. I appreciate the creativity and independence you allowed me, while always supporting and advocating for me. I treasure the valuable lessons you have imparted, and I aspire to give back in the future by serving students as you have. Dr. Diane Bales and Dr. Jori Hall, thank you both for the time and effort you contributed to this project and for serving on my committee. Dr. Mary Ann Johnson, thank you for your guidance during the proposal writing phase. Having a thorough proposal in place made doing the project straightforward. A huge thank you to Kathryn Parrot and Fabiola Jimenez Mesa for your assistance with the data collection. I am grateful for the extra effort you two put in to help me complete my project. Most of all, thank you to God, my husband, and my family. I love you all dearly.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

Healthy Child Care Georgia (HCCG) is a nutrition and physical activity intervention designed to increase the quality and quantity of nutrition and physical activity education for children in early care and education (ECE) programs in Georgia. The intervention consists of an initial teacher training on obesity prevention best practices, guided goal setting, and a six-week curriculum of developmentally appropriate, interactive activities and lessons about nutrition and physical activity. Each week of the six-week curriculum includes the following: a children's book, song, large group activity, fruit and vegetable tasting, and two other activities (math, science, art, etc.). Each week focuses on one key concept (Figure 1). The lessons and activities are designed to be easily incorporated into the classrooms' weekly curriculum because they align with the Georgia Early Learning and Development Standards (GELDS).

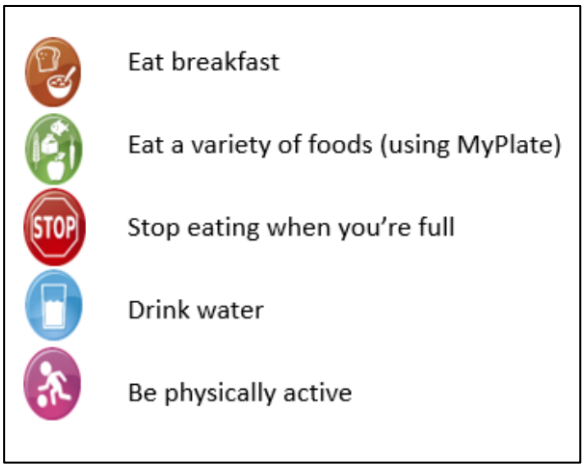


Figure 1. Key concepts taught during the HCCG intervention.

In addition to the curriculum, the participating teachers are provided with the program materials that are needed to carry out the lessons and activities. Both consumable (e.g. cut up fruits and vegetables for weekly taste testing, colored ice cubes for ice cube painting) and non-consumable (e.g. books, song posters) materials are included. During the six weeks of

curriculum implementation, the teachers are observed and supported by the research staff. The HCCG team is led by Dr. Caree Cotwright and Dr. Diane Bales. Research assistants include Hannah Urban and Fabiola Jimenez. The program assistant is Kathryn Parrot.

The overall goal of HCCG is to reduce the risk of childhood obesity. The success of HCCG is important, because childhood obesity is a major threat to public health. In the US, 22.8% of children ages 2 to 5 are overweight or obese (1). In addition, the proportion of newly diagnosed childhood obesity cases each year is highest among 2-5-year-old children at 4% (2). These data illustrate how early in the lifespan the obesity epidemic is beginning.

Preschool teachers are potential change agents for combating obesity because teacher modeling can influence child behavior, and teacher characteristics shape the classroom environment (3). However, observations of preschool teachers previously participating in the HCCG program revealed that many do not use their behavior to model the obesity prevention best practices and policies introduced by HCCG. Enhancing teacher modeling is desirable, because observational learning is a promising method to influence child nutrition and physical activity behaviors. This mixed methods study investigated what barriers prevent teachers from implementing and modeling obesity prevention best practices and policies. The researchers investigated the impact of goal setting and weekly coaching sessions on both implementation and modeling of best practices and policies and teacher self-efficacy to model healthy habits.

We hypothesized that teacher goal setting and weekly coaching sessions would 1) improve teacher implementation of best practices and role modeling, and 2) increase self-efficacy to model. In order to enhance the goal setting component of HCCG, a motivational interviewing technique was employed. These interviews helped teachers identify barriers that

hindered implementation and modeling of obesity prevention best practices and policies. During the motivational interviews, the teachers brainstormed ways to overcome those identified barriers. Teacher surveys were collected to measure self-efficacy for modeling nutrition and physical activity behaviors. Classroom observations were conducted to assess teacher implementation and modeling of obesity prevention best practices and policies. The project is significant because motivating and supporting teachers to become healthy role models has the potential to increase the efficacy of HCCG. The approach is innovative because it is teacher centered. While reducing childhood obesity is the goal of HCCG, this study sought to modify the behaviors and practices of the teacher, recognizing the potential for preschool teachers to be change agents. The findings of this project serve to help the research team understand what barriers are preventing the HCCG teachers from implementing and modeling best practices. It will also inform whether goal setting and coaching are effective tools for enhancing teacher implementation of best practices and self-efficacy to model healthy habits within a childhood obesity prevention program.

CHAPTER 2

LITERATURE REVIEW

The burden of early childhood obesity

Early childhood obesity is a major public health concern in the United States (US)(2). The 2011-2012 *National Health and Nutrition Examination Survey (*NHANES) reports that 22.8% of children ages 2-5 in the US are overweight or obese (1). These data mean that these youth have a BMI at or above the 85th percentile on the Centers for Disease Control and Prevention (CDC) sex-specific growth charts. Of those, 8.4% of children fall into the obese category with a BMI at or above the 95th percentile (1). The proportion of newly diagnosed childhood obesity cases in the US each year is highest among 2-5 year-old children at 4%, compared to 5-13 year-old children (3.2%) and adolescents (1.8%)(2).

Failure to meet nutrition and physical activity recommendations

Closely related to the prevalence and incidence of early childhood obesity is the failure of many children to meet the US Dietary Guidelines for Americans (DGA) and physical activity guidelines. The 2015-2020 DGAs recommend daily consumption of 1.5 cups of vegetables, 1 to 1.5 cups fruit, and 2.5 cups dairy for children consuming 1,200 (sedentary) to 1,400 (moderately active) calories (4). However, children ages 2-5 consume an average of only 0.6 cups of vegetables, 1.3 cups of fruit, and 2 cups of dairy per day (5). While physical activity recommendations vary slightly between organizations, the 2011 *Caring for Our Children* standards recommend that preschoolers (ages 3-6) should engage in 90 to 120 minutes of total

physical activity per school day (6). There is much evidence to support that preschoolers fall extremely short of such physical activity recommendations (6).

Value of the early care and education (ECE) environment for obesity prevention

ECE is any educational program for children ages 0-5, such as a preschool program. The first five years of life are a critical period of growth and development, and early childhood experiences can influence health over a lifetime. Therefore, obesity prevention efforts should focus on those first 5 years of life (7). Because a large majority of children ages 3-5 in the US participate in ECE, this environment provides an excellent opportunity for childhood obesity prevention strategies (8, 9).

Taste preferences are still developing in early childhood

Taste preferences begin during development in utero (10). Repeated exposure of flavors from the foods mothers consume shape the taste preferences of the infant after birth. The flavors that infants experience during breastfeeding (which varies widely, based on maternal diet) or formula feeding help them later accept novel solid foods with those same flavors (10). During weaning and complementary feeding on to early childhood, repeated exposure and variety exposure are key for food acceptance. Human taste preferences are malleable because experiences help us develop likes and dislikes. As a result, repeated exposure to healthy foods in early life can set children up to make healthier choices throughout their lives (10).

Modeling as an influence of eating behavior

Child eating behavior is also shaped by social influences (10). A few examples include marketing (i.e. Tony the Tiger, a cartoon character use to sell cereal), rewards, and modeling. Modeling of enjoyment of foods by adults or peers can influence child food acceptance.

Because modeling can be done by either peers or adults, preschool teachers have multiple opportunities every school day to model enjoyment of healthy foods. In cases of peer modeling, there is evidence to support that preschoolers prefer foods eaten by models of similar age and gender who enjoy the food (10).

A 2017 report from the World Obesity Federation recommends that caregivers of children ages 2-5 years continue to introduce new, healthy foods with repeated exposures to children to promote child acceptance of the food (10). The report also recommends that caregivers model eating and enjoying healthy foods (nutrient rich) instead of unhealthy (nutrient poor) foods in front of children (10). HCCG uses a weekly taste test activity to expose preschoolers to five fruits and five vegetables. The students have an opportunity to try the foods once per week for the six weeks of the program (11). The taste test activity complies with the recommendation to continually introduce healthy foods across repeated exposures.

Obesity prevention best practices

The obesity prevention best practices endorsed by HCCG are derived from the 2011 *Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs, Third Edition.* This publication was produced via a collaboration between the American Academy of Pediatrics, the American Public Health Association, and the Maternal and Child Health Bureau (6).The *Caring For Our Children* (CFOC) standards are ideals that should be implemented in US ECE settings, because they represent the best evidence, expertise, and experience on quality health and safety practices and policies (6). A complete list of the best practices introduced and promoted by HCCG can be found in the Appendix. A subset of the best practices that concern teacher behaviors are listed in Table 1.

Table 1. HCCG Obesity Prevention Best Practices related to teacher behaviors
1) Children are never encouraged to eat more than they want and are never asked to "clean their plate" or "make a happy plate".
2) Caregivers talk informally about healthy foods during meals and reinforce children's internal cues of hunger and fullness every day.
3) Caregivers never offer food incentives for good behavior (like sweets, or food-related parties).
4) Caregivers gently encourage, but do not force, children to try all food components offered at meals and snacks every day.
5) Caregivers sit with children during meals and snacks and eat the same foods as the children every day.
6) In front of the children, caregivers only drink healthy beverages like water, low-fat milk and 100% juice every day.
7) Drinking water is available during outdoor play, and caregivers encourage children to drink water every day.
8) Caregivers encourage children 1 year and older to drink water many times throughout the day.
9) Physical activity time is never withheld as punishment when children are misbehaving.
10) Caregivers participate in active play and encourage children to be active every day.

Teachers as role models for obesity prevention

There is a great need to reach preschool aged children with obesity prevention practices and policies (9), and preschool teachers are potential change agents who can accomplish this goal. Modifying the behaviors of preschool teachers may be a powerful tool for childhood obesity prevention. Social Cognitive Theory (SCT) is the theoretical framework for this study (12). According to a key construct of SCT, observational learning, an individual acquires a behavior by watching the actions and outcomes of others' behavior (12, 13).

A potential strategy for obesity prevention using the construct of observational learning is having teachers, serving as credible role models, performing the desired obesity prevention behaviors (healthy habits) in front of the students. To illustrate, a study conducted with preschool aged children assessed the influence of adult eating behavior modeling on child eating behaviors. Three experimental conditions were used; the presence of an adult model without food, an adult model eating the same food but of a different color, and an adult model eating the same food of the same color. Children accepted and ate more of the novel food when the adult model was eating the same food of the same color compared to the other groups (14).

Another experiment evaluating the influence of adult models on preschool children's eating found that silent modeling, in which the adult model ate the food but did not speak about the food with the students, was not effective at increasing food acceptance. Enthusiastic teacher modeling, in which the adult model expressed enjoyment of the food, increased acceptance of novel foods and sustained the food acceptance across 5 meals (15). These studies and the observational learning construct of SCT support that teachers, acting as role models, may promote healthful eating behaviors in their students by enthusiastically consuming healthy foods with the students at mealtimes.

According to SCT, the three major factors that affect an individual's likelihood of changing a health behavior are: 1) goals; 2) self-efficacy; and 3) outcome expectancies (13). Motivational interviewing is an evidence-based counseling technique designed to elicit personal motivation for change by exploring and resolving ambivalence (16). Setting goals is a key component of motivational interviewing. Goals set in motivational interviewing should ideally

be specific, measurable, attainable, realistic, and time-bound. The goals should be decided on by the interviewee (self-determined), rather than the interviewer (assigned). Motivational interviewing is an established method for supporting dietary and exercise behavior changes in individuals, specifically by improving self-efficacy (17).

Current landscape of teacher modeling for obesity prevention

Teacher wellness behaviors in the ECE environment have been evaluated by several studies (3, 18, 19). Esquivel et al. (2016) found that teacher-level wellness characteristics could influence obesity prevention intervention effectiveness in the ECE setting. The teachers' personal health behaviors had a significant influence on the classroom nutrition/physical activity environment (3). These findings support that providing technical assistance and periodic wellness coaching to teachers to improve their personal health behaviors is an effective approach to change classroom environments to better support obesity prevention.

Dev et al. (2014) evaluated the feeding attitudes and styles of child care providers and found that their personal health beliefs and challenges influenced the feeding environment. The cross-sectional study evaluated the determinants of ECE providers' healthful and controlling feeding practices. They found that several factors contributed to providers' feeding practices, including: race, education, training, feeding attitudes and styles, and ECE context (18). Providers who were trying to lose weight, concerned about children's weight, and considered nutrition to be important in their personal diet were more likely to have restrictive feeding practices, such as limiting child food intake. The investigators concluded that qualitative methods should be used to evaluate provider motivation and barriers concerning feeding

practices, because educating providers about feeding practices and overcoming barriers to adopting healthful practices may help fight early childhood obesity (18).

Freedman et al. (2010) assessed early childhood feeding practices and attitudes of caregivers and attempted to increase child feeding knowledge with education. The researchers found that caregiver knowledge significantly increased after the education intervention. Knowledge of a best practice did not, however, always translate to teacher adoption of the practice. The investigators concluded that ensuring increased knowledge translates into correct behaviors is important (19).

Observational studies of ECE environments indicate that many teachers are not using their positions of influence to model ideal obesity prevention behaviors (18, 20). This is not likely due to teachers' lack of understanding about the significance of their influence. A survey of 124 ECE providers in North Carolina found that 52% of providers said their involvement in class mealtime was "extremely important," 46% said it was "important," and only 5% said it was "sort of" or "not particularly important" (20).The same survey collected baseline information about how the providers reported using their behavior to influence child eating. That data was then compared to 4 days of mealtime observations of the providers. The observational data suggested that the providers did not always do what they said they would do regarding modeling of healthy eating. Providers consumed sugar-sweetened-beverages in front of children on each of the 4 days and at almost every meal at most centers. Providers at most centers consumed unhealthy foods on at least 1 of the 4 days (20).

Rationale

HCCG uses a practice-based wellness intervention for children in ECE programs (11). In the fall of 2016, school observation visits to classrooms participating in the HCCG program revealed that there is currently a disconnect between the best practices and policies that HCCG promotes and the practices implemented and modeled by the preschool teachers. For example, teachers were observed sitting at picnic tables outside during outdoor play time while students were playing, rather than leading and engaging in physical activity with the students. By sitting out, the teachers failed to reinforce the importance of physical activity. The teachers who previously participated in HCCG did not extensively use their behavior to reinforce the healthful behaviors taught by HCCG. Current research supports that this dissonant situation of not modeling the health behaviors taught in the classroom is not isolated to the teachers using HCCG (18, 20). It is important to uncover the barriers that prevent teachers from modeling obesity prevention best practices and policies, because improved teacher modeling has the capacity to enhance the efficacy of HCCG. Enthusiastic teacher modeling has been shown to be effective at increasing preschool students' acceptance of new foods (15). Also, the presence of an adult consuming a food of the same color is a promising way to increase 2-5 year olds' acceptance of a novel food compared to the mere presence of an adult model (14).

Research questions

1. What are the barriers that prevent teachers from implementing and modeling the obesity prevention best practices and policies introduced by HCCG?
2. In what ways do teacher goal setting and weekly coaching sessions change teacher implementation and modeling of the HCCG obesity prevention best practices and policies?
3. In what ways do teacher goal setting and weekly coaching sessions change teacher self-efficacy to model healthy nutrition and physical activity behaviors?

Hypothesis

Teacher goal setting and weekly coaching sessions improve teacher modeling and implementation of the obesity prevention practices and policies introduced by HCCG, and increase teacher self-efficacy to model healthy nutrition and physical activity behaviors.

Specific aims

1. Determine the barriers to teacher implementation and modeling of obesity prevention best practices and policies by conducting a needs assessment consisting of interviews and a survey with the preschool teachers participating in HCCG.
2. Assist teachers in setting goals for implementation and modeling of HCCG obesity prevention best practices and policies through action planning and motivational interviewing.
3. Provide teachers with a weekly coaching session to assist them in reaching their goals. Give supplemental materials and troubleshooting advice as needed.
4. Evaluate teacher progress with a follow-up observation, interview, and survey.

CHAPTER 3

METHODOLOGY

Study design

This project was a formative evaluation (21), designed to improve the efficacy of the HCCG program by encouraging teachers to role model and implement obesity prevention best practices. There is no intention to generalize these findings beyond the setting of the HCCG program. Patton describes the purpose of formative evaluations as "to improve human intervention within a specific set of activities at a specific time for a specific group of people (21)." This description accurately describes the purpose of this study.

This mixed-methods formative evaluation was conducted using a purposeful sample of the six Clarke County Pre-Kindergarten teachers participating in the fall 2017 cohort of HCCG. The study sample size was constrained to the number of teachers in the HCCG program (six in total). Three teachers were from Oglethorpe Avenue Elementary school and three were from Howard B. Stroud Elementary School. All methods and procedures were approved by the University of Georgia Institutional Review Board on Human Subjects.

Both quantitative and qualitative data were collected and analyzed. The purpose of the quantitative data was to objectively determine if there were changes in teacher self-efficacy or the number of best practices being implemented and modeled in the classrooms from baseline to follow up. The quantitative data included teacher self-efficacy rankings and the observation of the presence or absence of a best practice. The purpose of the qualitative data was to

expand upon and add depth to the quantitative findings and to determine the barriers to teacher implementation and modeling of obesity prevention best practices and policies. The qualitative data included field notes from the interviews, observations, and coaching.

At the HCCG 2017 fall cohort teacher training, the six participating teachers learned about best practices for obesity prevention and set action plans (goals). The action plans consisted of two best practices (one related to nutrition and one related to physical activity) they wanted to work toward in their classrooms.

In week 1 of the intervention, a series of baseline measures were taken (Table 2). The classrooms were observed for best practices using the HCCG Best Practice Observation Survey. This is an original survey tool, modified from the HCCG Nutrition and Physical Activity Best Practice Checklist to include only the items within the immediate control of the teacher. For example, items related to provision of biannual nutrition and physical activity teacher trainings and content of the school menu were left off the checklist, since the teachers were not immediately in control of those things. The survey was used to measure the presence or absence of obesity prevention best practices in the classroom, and to collect open-ended information about what occurred with respect to the best practices in the classroom. Additionally, teachers completed a Confidence about Activity and Nutrition Teach (CAN Teach) survey. This tool is utilized by HCCG and measures self-efficacy to teach and model nutrition and physical activity concepts on a seven-point Likert scale (11). Finally, each teacher participated in an initial interview. At the interview, the researcher used a motivational interviewing technique (16). Motivational interviews were utilized to help teachers: reflect on their role as a healthy role model for their students, identify potential barriers to their goals,

identify potential barriers to their ability to model, and identify ways to move past any barriers. Together the researcher and teacher reviewed the teacher's action plan (from HCCG training), discussed the importance of teacher modeling, discussed ways in which the teacher could implement and model the two selected best practices, identified the barriers to implementation and modeling, and discussed solutions to the barriers. Interview notes were used to document the interviews. Outcome expectancies were discussed during the initial interview and during the weekly coaching process.

During weeks 2-7 of the intervention, the HCCG program was implemented in the classrooms by the teachers. A weekly classroom observation (50 minutes) and teacher coaching session (10 minutes) were conducted for each classroom. Field notes were used to document the observed class times and coaching sessions for analyses. During the 10-minute coaching session, the researcher asked the teacher about their progress toward their goals. If any barrier or need was identified, the researchers provided appropriate support (e.g. a shower caddy to carry water pitchers and paper cups outside to the playground). The coaching served as technical assistance for and promotion of implementation and modeling of best practices. Week 4 of the intervention marked the midpoint of the program. During that week, the researchers completed a mid-point Best Practice Observation Survey.

Week 8 was the final week of the intervention. A final Best Practice Observation Survey was completed. Follow-up interviews were conducted, at which the teacher and researcher discussed the teacher's progress in meeting their action plan goals. Interview notes were used to document the interviews. Finally, the teachers completed a second CAN Teach survey.

An original survey tool, modified from the HCCG Nutrition and Physical Activity Best Practice Checklist, was used to conduct the 3 best practice observations (baseline, midpoint, and follow-up). This observation tool, the HCCG Best Practice Observation Survey, enabled the researcher to determine if and how the teacher was implementing and modeling best practices for childhood obesity prevention. A copy of the survey can be found in the appendix of this document.

Table 2. Intervention timeline

Week 1	HCCG teacher training Setting an action plan Best practices observation (baseline) Can Teach survey (pre) Teacher motivational interviews
Week 2	Classroom observation (50 mins) Coaching (10 mins)
Week 3	Classroom observation (50 mins) Coaching (10 mins)
Week 4	Classroom observation (50 mins) Coaching (10 mins) Best practice observation (mid-point)
Week 5	Classroom observation (50 mins) Coaching (10 mins)
Week 6	Classroom observation (50 mins) Coaching (10 mins)
Week 7	Classroom observation (50 mins) Coaching (10 mins)
Week 8	Follow-up teacher interviews Best practices observation (post) Can Teach survey (post)

Quantitative analysis

Descriptive statistics were calculated for the change variables and the variables at baseline, midpoint, and follow up. A nonparametric test was most appropriate with the small sample size, so Wilcoxon Signed Rank tests were used to explore whether significant changes occurred in provider self-efficacy or the number of best practices implemented and modeled between time points. The software package IBM SPSS version 24 was used. The level of statistical significance for was defined at $P < 0.05$.

Qualitative analysis

Nvivo is a Qualitative Data Analysis Software (QDAS) tool used to support qualitative and mixed methods research (22). Nvivo 11 Pro for Windows was used for this project to store the data, organize it into appropriate folders, code the data into nodes, and create a node hierarchy. The researcher attended a two-day Nvivo workshop at the University of Georgia (QUAL 8700) taught by Dr. Jori Hall and William Fassbender to ensure effective utilization of the software for the project.

Data from the teacher interviews and best practice observations was analyzed via thematic analysis (23) of interview and field notes. The thematic analysis approach involved reading the data, coding the data into nodes, creating a node hierarchy, revising node content, and organizing the data included in the nodes into themes through interpretation. Both inductive and deductive coding approaches were utilized (21, 23). The deductive coding approach was guided by the concepts identified in the research questions: barriers, self-efficacy, implementation, modeling, goal setting and coaching. These concepts were informed by the researcher's experience with one semester of the HCCG program, the literature review,

and the theoretical framework. Inductive coding was used to refine and create new nodes as the coded data was read and re-read.

First, the interview and field notes were read numerous times to gain and understanding of the data. Then, using the research questions as a guide, the researcher generated initial nodes titled barriers, self-efficacy, implementation, modeling, goal setting and coaching. Nodes can be thought of as “conceptual containers” (Dr. Jori N. Hall). Each node was defined after the first level of coding using the Nvivo code book feature (Windows Pro version 11). The code book was used to provide a description of what type of information was coded at each node (Table 3). After the first level of coding, the nodes were revisited to further organize and refine the information. At this stage, an inductive coding technique rendered new, more specific nodes within the existing nodes. For example, the node “barriers” was divided up into the specific types of barriers that were identified, such as “time constraints” and “forgetting.” The nodes were then analyzed for potential themes. The potential themes were reviewed, defined, and named (23). Thematic analysis of codes related to teacher self- efficacy were used to evaluate if there were any changes in teacher self-efficacy to model healthy behaviors at the conclusion of the program. Thematic analysis of codes related to goal setting and coaching were used to evaluate if those methods improved teacher self-efficacy to model healthy behaviors at the end of the program. Teacher profiles were created for each teacher to organize and evaluate the open-ended information from the HCCG Best Practice Observation Surveys. These profiles were used to describe any changes in teacher implementation and modeling of best practices across the three timepoints. They compiled the detailed information about what was going on in each classroom at each time point of observation. The data is rich

because it goes beyond the mere presence or absence of a best practice. The cases provide insights as to *how* teachers had both positive and negative implementation and modeling of obesity prevention best practices.

Table 3. Code book used for qualitative data analysis in Nvivo	
Barriers	Things that either hindered the teachers from implementing and modeling of obesity prevention best practices or the teachers expressed may hinder their implementing and modeling of obesity prevention best practices
Forgetting	Instances where teachers did not remember to implement and model obesity prevention best practices
Other responsibilities	Duties that the teachers identified that kept them from implementing and modeling obesity prevention best practices
Physical and spacial limits	Environmental or personal characteristics that hindered, or the teachers anticipated would hinder them from implementing and modeling the obesity prevention best practices
Student distraction	Ways the teachers anticipated or ways they observed that implementing and modeling the obesity prevention best practices would be/were disrupt their students
Time constraints	Ways the teachers anticipated or ways they observed that implementing and modeling the obesity prevention best practices would be/were limited by the schedule of the school day
Facilitators	Things that either helped the teachers implement and model obesity prevention best practices or the teachers expressed may help them implement and modeling obesity prevention best practices
Materials and resources	Teachers identified having supplies provided made it possible to reach their action plan goals and implement and model obesity prevention best practices

Goal setting and coaching	Information from the follow up interviews related to the teachers' perceptions of the goal setting and weekly coaching sessions
Implementation and modeling	Information from the open-ended items of the best practice observations and the coaching notes The observations are further classified as either positive or negative implementation and modeling, depending on if the scenario observed was in accordance with obesity prevention best practices (positive) or went against obesity prevention best practices (negative).
Negative	Observations from the best practice observations or coaching that were not in accordance with obesity prevention best practices
Positive	Observations from the best practice observations or coaching that were in accordance with obesity prevention best practices
Self-efficacy to model	Information related to how efficacious the teachers feel about modeling healthy eating and physical activity in their classroom or how they do so

Data management

Field notes from interviews, classroom observations, and coaching sessions were kept in the researchers' journals and files. The journals and files were locked in the researchers' office. The data was transcribed into Word documents and Excel files, stored on a flash drive, and backed up on the HCCG OneDrive folder. Paper copies and flash drives were locked in the researchers' office. Only individuals on the SNAP-ED/HCCG-IRB approval had access to the data. Codes were used to deidentify the data.

Subjectivity Statement

In qualitative research, the researcher is an instrument of data collection and interpretation (21). Because of this, it is important to recognize the subjective lens with which I (the researcher) view this project and the findings. In doing so, I am in a better position to manage my biases in the process of data collection and analysis.

I am a dietetic intern and master's student at the University of Georgia studying nutrition. My research project involved me motivating and coaching preschool teachers to become better role models for obesity prevention in their classrooms. Due to my background in and passion for nutrition, I was eager to see the teachers succeed in their goals for modeling and implementing obesity prevention best practices. The teachers were aware of my desire for their success because of the nature of my relationship with them and the Healthy Child Care Georgia project. In other words, it was no secret that I wanted them to become a better role model for obesity prevention. Because of this, the teachers may have felt pressured to appease me as the researcher and provide information in the interviews and surveys that is not truly representative of themselves or their experiences.

I recognize these biases and have made an effort to limit their influence on my project. To enhance the integrity of my data collection, my committee members reviewed and edited my interview protocol and best practice observation checklist. Also, I used member checking during interviews and data triangulation via the interviews, surveys, observations to confirm that my data was credible. I also used a research journal to keep track of and manage my biases during the research process. Throughout data collection and interpretation, I strove to manage my biases and garner an understanding of what was truly going on- not to prove an outcome.

CHAPTER 4

RESULTS

Quantitative findings

Self-efficacy was reported in two questions from the CAN Teach survey. Teachers ranked their self-efficacy to model healthy eating and physical activity behaviors on a 7-point Likert scale (1 being lowest self-efficacy, 7 being highest) at both baseline and follow up (Table 4). The median self-efficacy scores were not significantly different from baseline to follow up for either healthy eating (Z = 0.000, p = 1.000) or physical activity (Z = -1.732, p = 0.083) (Table 5).

Table 4. Self-reported teacher self-efficacy scores from the CAN Teach survey

Teacher	Nutrition Pre	Nutrition Post	PA pre	PA post
1	6	5	6	5
2	6	5	6	5
3	7	7	7	7
4	6	7	6	5
5	5	6	6	6
6	6	6	6	6

* Self-efficacy was scored on a 7-point scale, with 7 being highest self-efficacy to model.

Table 5. Median self-efficacy scores and results from Wilcoxon signed rank test on self-efficacy scores comparing baseline to follow up

	n	Median ± SD	z	p-value
Healthy Eating Self-efficacy (max score = 7)				
Baseline	6	6 ± 0.632		
Follow up	6	6 ± 0.894		
Wilcoxon signed rank			0.000	1.000
Physical Activity self-efficacy (max score = 7)				
Baseline	6	6 ± 0.408		
Follow up	6	5.5 ± 0.816		
Wilcoxon signed rank			-1.732	0.083

From baseline to follow up, two of the six teachers (33%) reported a slight increase in self-efficacy to model healthy eating behaviors, while two teachers (33%) reported no changes, and two teachers (33%) reported a slight decrease in self-efficacy to model healthy eating behaviors. From baseline to follow up, three teachers (50%) reported a slight decrease in self-efficacy to model physical activity behaviors, and three teachers (50%) reported no changes in self-efficacy to model physical activity behaviors. From these data alone, it seems that the intervention likely had no influence on teacher self-efficacy to model healthy eating and physical activity behaviors. However, the qualitative data concerning teacher self-efficacy indicate otherwise.

Research assistants collected the following best practice data via observations at baseline, mid-point, and follow up (Table 6). At follow up, there was an increase from baseline in the number of teachers implementing or modeling the following ten obesity prevention best practices: involving children in mealtime activities, modeling consumption of healthy beverages, providing nutrition education, displaying nutrition support materials in the classroom, encouraging water consumption throughout the day, providing nutrition information and resources to parents, leading 60 minutes of structured physical activity, providing physical activity education, displaying physical activity support materials in the classroom, and providing physical activity information and resources to parents (Table 6).

There was no change from baseline to follow up in the number of teachers implementing or modeling the following five obesity prevention best practices: not encouraging a “happy plate”, sitting with children and eating the same food as them at meals, making water

available while outdoors, scheduling physical activity for 120 minutes per day, and participating with children in active play (Table 6).

Table 6. Number (%) of teachers implementing and/or modeling the HCCG best practices at baseline, midpoint, and follow up per research assistant observations

	Baseline	Midpoint	Follow up	Baseline vs. follow up
Nutrition related best practices				
No happy plate	6 (100%)	4 (100%)	6 (100%)	no Δ
Involved in mealtime	2 (33%)	4 (100%)	6 (100%)	↑
Healthy foods	2 (33%)	2 (50%)	1 (17%)	↓
No food as incentive	4 (67%)	3 (75%)	3 (50%)	↓
Gently encourage	3 (50%)	2 (50%)	2 (33%)	↓
Sit and eat with children	0 (0%)	1 (25%)	0 (0%)	no Δ
Model healthy beverages	1 (17%)	1 (25%)	2 (33%)	↑
Nutrition ed	0 (0%)	4 (100%)	6 (100%)	↑
Nutrition materials	3 (50%)	4 (100%)	5 (83%)	↑
Water available	0 (0%)	1 (25%)	0 (0%)	no Δ
Encourage water	0 (0%)	0 (0%)	2 (33%)	↑
Nutrition info for parents	0 (0%)	4 (100%)	6 (100%)	↑
Physical activity related best practices				
120 minutes scheduled total PA	0 (0%)	1 (25%)	0 (0%)	no Δ
60 minutes structured PA	0 (0%)	1 (25%)	1 (17%)	↑
PA not withheld	4 (67%)	4 (100%)	3 (50%)	↓
Teacher participates in play	3 (50%)	3 (75%)	3 (50%)	no Δ
PA ed	0 (0%)	2 (50%)	6 (100%)	↑
PA materials	0 (0%)	1 (25%)	2 (33%)	↑
Not seated >15 mins	4 (67%)	3 (75%)	3 (50%)	↓
Screen time < 30 mins per week	6 (100%)	4 (100%)	5 (83%)	↓
No TV at meals or snacks	6 (100%)	4 (100%)	5 (83%)	↓
PA info for parents	0 (0%)	4 (100%)	6 (100%)	↑

*Note: best practice data is missing for two of the six teachers at midpoint.

There was a decrease from baseline to follow up in the number of teachers implementing or modeling the following seven obesity prevention best practices: talking with students about healthy foods, not using food as incentive for good behavior, gently

encouraging students to try new foods, not withholding physical activity as punishment, students not seated for greater than 15 minutes, less than 30 minutes of screen time per week, and no TV watching during meals or snacks (Table 6).

This study evaluated 12 best practices related to nutrition and 10 related to physical activity. Data from the best practice observations were used to quantify the number of nutrition and physical activity best practices being implemented and modeled in each classroom at each time point. As expected, the number of best practices that the HCCG teachers were implementing and modeling in their classrooms increased over the course of the intervention (Table 7). The maximum number of nutrition best practices was 12, and the maximum number physical activity best practices was 10.

Table 7. Number of nutrition and physical activity (PA) best practices observed being implemented or modeled by each teacher at each time point
*Note: best practice data is missing for two of the six teachers at midpoint.

Teacher	Nutrition Best Practices Baseline	Nutrition Midpoint	Nutrition Follow up	PA Best Practices Baseline	PA Midpoint	PA Follow up
1	4	9	7	5	7	6
2	4	9	5	4	7	4
3	2	no data	7	2	no data	4
4	4	7	7	4	6	6
5	3	9	8	4	7	6
6	4	no data	5	4	no data	8

There were no significant changes in the number of best practices being implemented and modeled by teachers from baseline to midpoint for nutrition ($Z = -1.841$, $p = 0.066$) or physical activity ($Z = -1.857$, $p = 0.063$) best practices (Table 8). However, we observed a

significant increase in the number of best practices being implemented and modeled at follow up compared to baseline for both nutrition (Z = -2.220, 0.026) and physical activity (Z = -2.060, *p* = 0.039) best practices (Table 8). The missing data from two of the six teachers at midpoint likely prevented the determination of significant changes from baseline to midpoint. The median number of nutrition related best practices was 4 ± 0.837 at baseline and 7 ± 1.225at follow up (*p* = 0.026) (Table 8). The median number of physical activity related best practices was 4 ± 0.983 at baseline and 6 ± 1.500 at follow up (*p* = 0.039) (Table 8).

Table 8. Median number of best practices implemented or modeled at each time point and results from Wilcoxon Signed Rank test comparing scores of baseline to midpoint and baseline to follow up

	n	Baseline median ± SD	n	Midpoint median ± SD	z score, p-value	n	Follow up median ± SD	z score, *p*-value
Nutrition score (12 possible)	6	4 ± 0.837	4	8 ± 1.915	-1.841, 0.066	6	7* ± 1.225	-2.220, 0.026
Physical Activity score (10 possible)	6	4 ± 0.983	4	7 ± 0.500	-1.857, 0.063	6	6* ± 1.500	-2.060, 0.039

Qualitative findings

Qualitative findings are based on interviews conducted with the six HCCG teachers and field notes taken by the researchers while observing the teachers weekly. The data from the teacher interviews revealed what most teachers found to be important when asked about their perceptions of their role as a healthy model for students, barriers to best practices, facilitators of best practices, and their self-efficacy to be a role model for healthy eating and physical

activity. The field notes provided additional information about barriers and the effects of goal-setting from an observational point of view. This triangulation of data (interviews and field notes) adds strength to the findings.

The first section discusses barriers to best practices that the teachers predicted would or reported did hinder best practices in their classrooms in addition to barriers that were observed by the researchers. The barriers are summarized in Figure 1. The second section discusses the impacts of goal setting and coaching and how those interventions influenced teacher self-efficacy to model nutrition and physical activity behaviors.

Barriers to implementation and modeling of obesity prevention best practices

The following themes include predicted, reported, and observed barriers to best practice implementation and modeling.

1. The time constraints of the school day limits best practices.

A barrier to implementing and modeling obesity prevention best practices identified by the teachers was not having enough time in their school day. There are three ways in which time was an issue; time constraints limited the amount that teachers provided and encouraged water, their involvement during outside play time, and their participation/modeling at meals.

First, teachers identified the extra time it takes to stop and take water breaks and the consequence of needing more bathroom breaks to be a deterrent from encouraging and promoting water consumption throughout the day. If the teacher does not have a bathroom in the classroom, an increase in the amount of water breaks needed takes up even more time as they must send students out of class. A few quotations from a teacher illustrate this point:

> The water breaks are good, but they are having to go to the bathroom more (Coaching field notes, Teacher 5).
>
> There is not a bathroom near our classroom, so more water breaks would mean more time spent taking trips to the bathroom (Initial interview, Teacher 5).
>
> There is no scheduled time in the school day for bathroom breaks so taking them cuts into other class time (Initial interview, Teacher 5).

In multiple classrooms, the researchers observed teachers limiting water breaks to only after outside play. Even then, teachers monitored the water breaks and limited the amount that students could drink. In one classroom the teacher would sing, "one, two, three, that's enough for me (Coaching field notes, Teacher 1)," as each student drank to keep the line moving.

Another way in which time constraints are an issue for obesity prevention best practices relates to how the teachers act on the playground. The best practices state that teachers should be engaging in active play, encouraging students to be active, and leading structured activities. However, the teachers view outside play time and meals as an "unofficial meeting time (Follow up interview, Teacher 1)," since they do not have a planning period or any other official time in the day to meet with each other. This mentality keeps the teachers from implementing or modeling best practices on the playground and in the cafeteria.

Finally, the best practices state that teachers should sit with students and eat the same food at meals, talk about healthy foods, and encourage students to try new or less favorite foods. Unfortunately, many teachers do not sit and eat with their classes because the breakfast

and lunch meals are close together and the time allotted for them is short. The teachers do not want to be rushed, and consequently they wait to eat during nap time or after school. A comment from one teacher reflects these tensions, “I don’t eat when they do at lunch time because it is rushed, instead I eat at nap time (Initial interview, Teacher 5).” Another teacher expressed how if the students need help opening packages, milk cartons, or peeling fruit, those demands further limit the amount of time that she can sit and eat with the class. The researchers observed multiple teachers standing for entire meals while helping students open milk cartons and food packages. One teacher mentioned that as the school year goes on, the students learn how to open their own milk cartons. Development of this skill may free up teachers to sit more at meals. The short length of the meal would still be an issue, however.

2. Water is distracting to students.

Teachers have a priority to keep students focused on the lesson or activity at hand. Having water freely available was a predicted and actual distraction for some classrooms. One teacher stopped bringing water out to the playground because the students would huddle around it instead of playing. Another teacher stopped offering water throughout the day because when one student requested water, many others followed suit and disrupted the lesson. One teacher explained, “they need to get their energy out, not huddle around the water pitcher. They need to run (Follow up interview, Teacher 4).”

3. Students need space to be active.

Teachers identified the spacial limits of the classrooms and playgrounds as barriers to physical activity. At one school, there was no fence border around the playground, so the teachers had to keep the students on the small mulched area of the playground for safety

reasons. The researchers observed the teachers restricting the play area and calling students back on the mulch when they ran into the surrounding field. Inside the classrooms, teachers must plan activities that are appropriate for a small area. One teacher described this limitation: “Space is an issue, if we are doing things like yoga on the rug each student only has a small square (Interview, Teacher 1).”

4. Teachers have physical limitations for modeling activity.

The researchers observed the teachers often abstaining from physical activity, especially when outdoors. Some teachers identified their physical status to be a barrier to physical activity. These teachers felt they were limited in the amount of activity they could demonstrate for their students. Specifically, teachers identified weight status (obesity), energy levels, and basic functional capacity as limiting their activity. One teacher explained it this way: “My students run two laps at the beginning of recess, but I can’t run with them (Initial interview, Teacher 5).” The same teacher at the end of the program said: “There were rough days when I just didn’t have the energy to play and needed a break (Follow up interview, Teacher 5).” The mentality of using outside play time as a break is related to the mentality of using it as a meeting time. The problem being the teachers view outside play as time when they do not have to be teaching or modeling healthy behaviors.

5. Teachers want a caffeine boost during the school day.

The researchers observed all the teachers drinking coffee or tea in front of their students during the intervention. This habit hindered them from modeling the best practice of consuming only healthy beverages in front of students. According to the best practices, caregivers should only model drinking water, low-fat milk, or 100% juice in front of students.

One teacher said, “I need a caffeine pick up in the afternoon (Initial interview, Teacher 1).” Another also said, “I needed caffeine, so that made the healthy beverage goal difficult (Follow up interview, Teacher 2).”

6. Teachers forgot their best practice goals.

A few teachers had difficulty remembering the goals which they selected to work toward. The teachers were asked about their progress toward their best practice goals by the researchers every week after the classroom observation, and on few occasions their responses were along the lines of, “I forgot about that (Coaching notes, Teacher 6).” Forgetting about a best practice goal was obviously a barrier to implementation and modeling, because that means little or no attention was given to the practice that week.

7. Teachers need to monitor students during outside play.

Some teachers view their primary responsibility on the playground to be monitoring behavior and equipment use, and thus do not focus on engaging in active play with the students. A few quotations from the teachers illustrate this point:

> During outside time my job is to monitor. I do move by walking or swinging. I never sit down (Follow up interview, Teacher 3).
>
> When the students are not getting along I have to discipline them (Follow up interview, Teacher 6).
>
> I monitor trike (tricycle) usage (Follow up interview, Teacher 5).

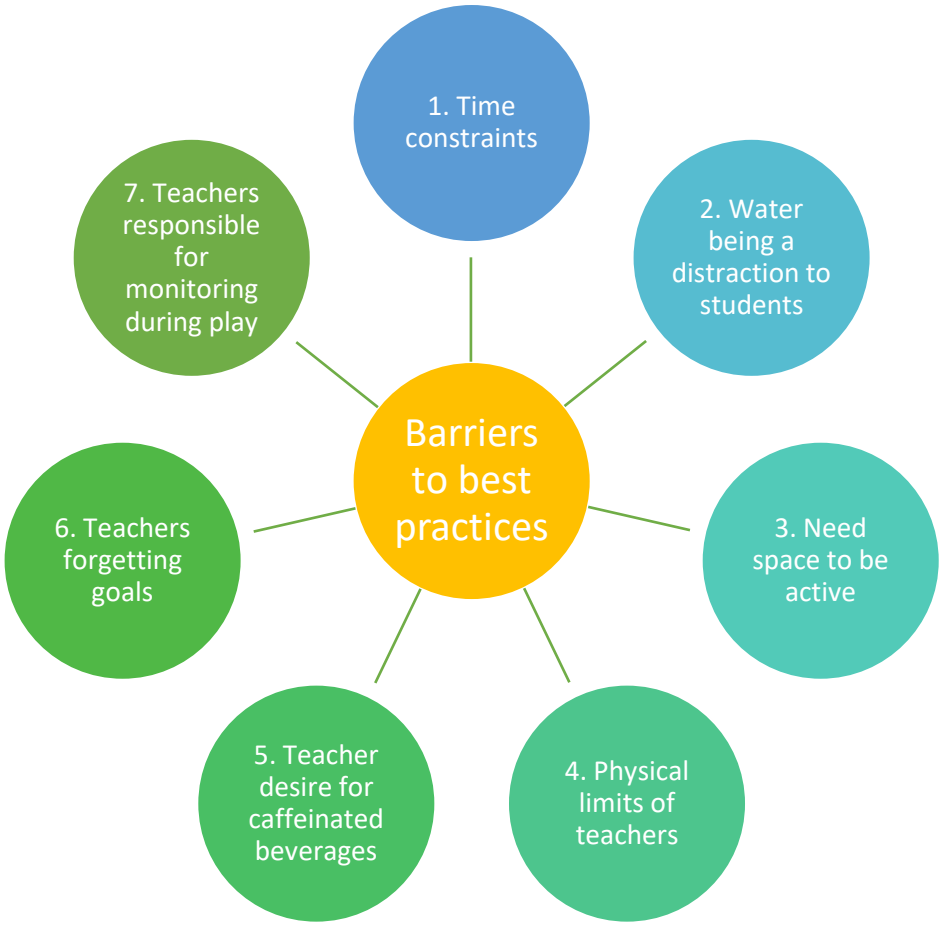


Figure 1. Thematic map of barriers to best practice implementation and modeling.

Impacts of goal setting and coaching

The following themes discuss the impacts of goal setting and coaching and how those interventions influenced teacher self-efficacy to model nutrition and physical activity behaviors. Goal setting and coaching gave teachers specific direction, motivated them, kept them involved in the program, gave them support, and increased their self-efficacy to role model nutrition and physical activity behaviors. These impacts are depicted in Figure 2.

1. Goal setting and coaching gave teachers specific direction.

Teacher action plan goals were set during the teacher training and refined during the initial interview. This process helped the teachers break down the best practices they chose to

work towards into smaller, more specific goals. This technique made the best practice targets manageable by narrowing down exactly what the teacher needed to do. One teacher explained, “I liked how goals were overarching with smaller steps to make it less overwhelming to work up to it (Follow up interview, Teacher 1).” Another teacher mentioned that the initial interview was good because it helped her “narrow down (Follow up interview, Teacher 4)” exactly what she was going to be doing.

2. Goal setting and coaching motivated teachers.

The teachers reported that their goals and the coaching kept them mindful of their behavior and accountable to the researcher, which was motivating for them. One teacher expressed this, saying: “Well, I knew you were going to ask me about it (Follow up interview, Teacher 5).” Another teacher reported: “It gave me something to accomplish (Follow up interview, Teacher 4).”

3. Goal setting and coaching kept teachers involved in the program.

The teachers reported in follow up interviews that the goals kept them involved and helped them make progress. The coaching sessions served as reminders and helped the teachers get back on track if they forgot about their goals. One teacher mentioned, “They (goals) expanded the (HCCG) content beyond the lesson or activity time to lunch and recess (Follow up interview, Teacher 1).” She elaborated further saying how they did the lessons and activities at specific times, but the subjects kept coming up throughout the day as they worked on their goals.

4. Goal setting and coaching made teachers feel supported.

Having a contact person and material expert was helpful to the teachers. Checking in each week for coaching made them feel supported. Coaching gave some teachers ideas for how to overcome barriers that came up. The following quote demonstrates these points: "Having the extra support made everything easier. It was something I didn't have to go looking for (Follow up interview, Teacher 3)."

5. Teachers had increased awareness and self-efficacy for modeling healthy eating and physical activity behaviors after HCCG goal setting and coaching.

After the HCCG program, the teachers indicated that they were more aware of their status as role model for health behaviors. All six teachers said they paid more attention to what they ate, drank, and the activity they did in front of their students because of the program. They conveyed their successes and confidence to be a healthy role model. The following quotations demonstrate the teachers' increased awareness and self-efficacy:

> If I drink this Coke in front of them that won't be meeting my goal (Follow up interview, Teacher 2).
>
> I am more aware of what I eat and drink in front of them. We have more conversations about food (at meals) (Follow up interview, Teacher 1).
>
> I've made it a point not to drink soda in front of them…(Follow up interview, Teacher 1).
>
> (I am) more aware that I am a role model for that type of thing (Follow up interview, Teacher 3).
>
> … a conscious effort to sit with the kids during meals (Coaching field notes, Teacher 2).

> We did yoga, they thought it was hilarious that I was down on the floor with them. I know they watch what I do. I don't think they would do all the (yoga) moves if I wasn't (Follow up interview, Teacher 2).

One teacher describes that she was taking the HCCG lessons to heart and applying the material to her own life, like not overeating at Thanksgiving. She said her family made fun of her for "taking the nutrition stuff so seriously (Follow up interview, Teacher 3)," but she believes if she is teaching it she should be living it.

One teacher reflected on the important role she realized she could play in modeling healthy behaviors: "It is a positive thing to do if you can model positive behaviors that they might not see at home. Fruits and vegetables are expensive, and some kids do not get enough food, so fruits and vegetables are not on the top of the shopping list for those families (Follow up interview, Teacher 5)."

Figure 2. Thematic map of the impacts of goal setting and coaching.

Teacher Profiles

The following case studies compile the information collected via the open-ended items on the Best Practice Observation Surveys. This information provides more depth and detail as to what was going on in each classroom at each time point of observation. This data is rich because it goes beyond the mere presence or absence of a best practice. These profiles provide insights to how teachers had both positive and negative implementation and modeling of obesity prevention best practices, which gives the researcher a more complete picture of what was going on in the classrooms as the HCCG program was underway. This insight can be used by the research team to better understand how to promote implementation and modeling of obesity prevention best practices among teachers. For example, the observations allowed the

researchers to document when a teacher partially met a best practice, like sitting with the students at meals but not eating the same foods as them. While the checklist only showed us that the teacher did not meet the entire best practice, the observations show that teachers already sit with students at times, but that getting them to eat the same foods is the challenge.

Teacher 1

At baseline, Teacher 1 allowed students to eat what they wanted and leave what they did not at meals. She threw away the trays for the students at the end of the meal, so students did not actively participate in clean up. The teacher sat with the students at breakfast but did not eat the same foods. Instead she ate a donut and coffee. During breakfast the teacher reminded the students to behave so they could have a popsicle party (which she explained is the school-wide reward policy). In the classroom, there was an "Eating the Alphabet" book on display, along with some various food models in the housekeeping center. There was no water available outside; water was only offered when coming in from outside play. This water break was monitored and limited by the paraprofessional, who sang, "one, two, three, that's enough for me!" as each student drank. Two students had to sit out at recess for misbehavior. The teacher supervised and handled disputes during outside play, she did not participate in or lead activities. The students were being rambunctious, so the paraprofessional told them they would go back inside if it continued. Both teachers sang and danced with the students during music and movement. Music and movement as well as an active story were interspersed throughout the day to keep the students moving. There was no TV in the classroom.

At midpoint, the class had a shorter lunch period due to misbehavior at the bathroom break before lunch, which took up extra time. The school-wide popsicle party is still being used

as an incentive for good behavior. The teacher also gave out crackers during small groups as a reward for students being quiet, saying, “nice job for not talking.” She sat with students during lunch and ate the same food as the students. She drank unsweet tea. During lunch she told a few distracted students to turn around and eat. There are several nutrition support materials displayed in the classroom: food models, books, and posters. Drinking water was still not available outdoors, it was only offered for three seconds after outside play. There was no structured activity during outside play. The teacher participated in music and movement. She encouraged students that they were doing a good job. The teacher was playing with the students in an unstructured manner throughout outside time. She has sent home the HCCG newsletters to provide physical activity and nutrition information to parents.

At follow up, students helped clean up their tables by stacking trash on their trays. The school-wide popsicle party is still being used as an incentive for good behavior. The teacher drank hot tea at breakfast. She made the hot tea at the table with the students and explained how it was done. She had them make predictions about what would happen. The teacher stood during most of breakfast, helping students open milks, etc. The teacher sat with students at lunch and ate the same foods as them. There are several nutrition support materials displayed in the classroom: poster about breakfast foods, food models, and an “Eating the Alphabet” book. Drinking water was still not available outdoors, it was only offered for three seconds after outside play. Outside play was observed for 50 minutes. During outside play 5 students sat out for misbehavior. The teacher was talking to some parents at the edge of the playground then came onto the playground and played with students a little. She was somewhat engaged in music and movement but was also trying to do other tasks.

In summary, teacher 1 improved the following practices: involving students in mealtime activities, eating the same food as students, engaging in active play during outside time in addition to engaging in music and movement, displaying nutrition support materials, and providing parents nutrition and physical activity information. Some negative practices that did not change included using food as an incentive for good behavior, restricting active play as punishment, and limiting water availability. A positive practice that did not change was engaging in music and movement.

Teacher 2

At baseline, Teacher 2 encouraged students to try a new food during lunch. She sat with children during lunch but packed her own food. There were no nutrition support materials displayed in the classroom. Water was not available outdoors; it was only encouraged after coming in from outside play. The teacher led 2 minutes of structure activity. She joined in the structured activity and made a positive comment to a student about physical activity. One time the students were seated for over 30 minutes. No screen time viewing was observed.

At midpoint, the students threw away their own trays at breakfast. Teacher 2 encouraged students to select broccoli at lunch. There was a MyPlate poster on display in the classroom. No water was available outside; water was only encouraged after outside play. The teacher did not join in active play. A poster of a boy swimming is on display in the classroom. Students were seated for about 20 minutes during a reading activity. They were taking bathroom breaks (getting up) during this time, but not all at once. She has sent home the HCCG newsletters and family activity bags to provide physical activity and nutrition information to parents.

At follow up, students cleaned up their own trays and there was a designated table cleaner. No students were observed resisting eating. The teacher sat with students but ate food from home (a parfait). She did not encourage water consumption at all during the day. Students with bad behavior had to sit out during group activities. Points were used to reward good behavior. Students were seated reading for about 20 minutes during small groups. The class watched cartoons during meals. The teacher said they do this quarterly when report cards come out. She has sent home the HCCG newsletters and family activity bags to provide physical activity and nutrition information to parents.

In summary, teacher 2 improved the practices of displaying nutrition and physical activity support materials and providing parents nutrition and physical activity information. Some negative practices that did not change included students remaining seated for greater than 15 minutes outside of nap and meal times and limiting water availability. Some positive practices that did not change were encouraging students to try or select healthy foods, involving students in mealtime activities, and engaging in music and movement. A negative practice observed at follow up but not at baseline was the students watching TV during a meal. Though this practice was not observed at baseline, the teacher's explanation shows that it is a negative practice that has actually been in place for the whole school year.

Teacher 3

At baseline, Teacher 3 sat with the students at breakfast and talked with them. She asked them if they were full or done eating. Students were responsible for disposing of their trays. She did not eat breakfast with the students and drank coffee. She encouraged them to "try a little bit of everything." Trick-or-Treat bags (with candy) were being used as incentive for

good behavior. In the classroom, there were food models in the housekeeping center. Water was not available outdoors but there were fountains in the hallway and classroom. Students could get water from the classroom fountain throughout the day. The teacher danced and sang along with the students during music and movement. She encouraged the students to dance too. At the beginning of outside play, she makes the students run twice around the playground. She walks with them as they run. There is no TV in the classroom.

At midpoint, students threw their trays away at breakfast. At lunch, the teacher sat with students and ate the same foods as them. She asked them if they liked their food. Stickers were used as incentive for good behavior. Several nutrition support materials were on display: MyPlate poster, food models, and "Growing Vegetable Soup" book. No outside time was observed today due to rain. The teacher sang and danced during music and movement. The class did a song about hydration when dancing to replace sweat losses. Seated time was broken up with music and movement. She has sent home the HCCG newsletters, family activity bags, physical activity recommendations, and a recipe idea (spinach salmon quesadilla) to provide physical activity and nutrition information to parents.

At follow up, students cleaned up their trays at breakfast. The teacher did not ask if students were full. She was standing at breakfast to help students open packages and milks, she did not eat. At lunch, the teacher encouraged students to eat, saying: "eat your pizza," "try two bites of this," "eat some food so you won't be hungry." She also discussed their tastes and preferences, saying: "do you like that?" "Was the smoothie good?" "What did it taste like?" There were several nutrition support and physical activity materials on display: MyPlate poster, food models, 2 posters of fruit and vegetable graphing activities (from HCCG family activity

bags), and a song poster. The teacher instructs students to run two laps around the playground at the beginning of outside play. She encouraged them to do so by saying, “go run! Show me who is going to win!” She participated during music and movement. She also encouraged the students many times during outside play to be active. Seated activities were regularly broken up by movement. Students had time outs during outside play for unsafe behavior like going down the slide backwards or wrestling. She has sent home the HCCG newsletters, family activity bags, physical activity recommendations, and a recipe idea (spinach salmon quesadilla) to provide physical activity and nutrition information to parents.

In summary, teacher 3 improved on the practices of providing nutrition and physical activity information to parents, displaying nutrition support materials, and not using food as incentive. She sent home recipes and information beyond the usual HCCG materials. A negative practice that did not change was the teacher not sitting and eating with students at all meals. Some positive practices that did not change were involving students in mealtime activities, encouraging physical activity, keeping students seated no longer than 15 minutes, making water available, engaging in music and movement, talking with students at meals, and encouraging students to try foods.

Teacher 4

At baseline, Teacher 4 sat with her students at meals but did not eat the same foods. She drank water at meals. There was no discussion of foods observed. Water was not available outdoors; it was only encouraged after coming in from outside play. Teacher led a structured physical activity with students (hokey pokey). There was no structured activity during outside play.

There was no open-ended best practice midpoint data collected for Teacher 4.

At follow up, the teacher sat with the students but did not eat the same foods. She drank water at lunch. There was one book about eating on display and magnetic pictures of healthy foods on a shelf. Water was not available outdoors; it was only encouraged after coming in from outside play. A few students had their own water bottles. Teachers did not participate in active play. The students were on the move constantly. There is no TV in the cafeteria or classroom. She has sent home the HCCG newsletters to provide physical activity and nutrition information to parents.

In summary, teacher 4 improved the practice of providing nutrition and physical activity information to parents via the HCCG materials. Some negative practices that did not change were restricting water availability and not eating the same foods as students at meals. Some positive practices that did not change were sitting with students at meals and modeling consumption of healthy beverages.

Teacher 5

At baseline, Teacher 5 sat with students during breakfast but did not eat the same foods. In the classroom, a book called “The Onion Ambassador” was on display. She restricts outside time if students do not listen or follow directions. She encouraged students to run around the track during outside play. She sat during music and movement.

There was no open-ended best practice midpoint data collected for Teacher 5.

At follow up, the teacher rewarded students with candy for listening during story time. A MyPlate and a HCCG song poster were on display. Water was available during breaks after breakfast, after outside play, and after nap. Physical activity time was withheld for students not

listening or following directions, “If you are going to play during my time, then you lose some of your play time.” She did not engage in active play with students on the playground. Students were seated for over 30 minutes during story time. She has sent home the HCCG newsletters to provide physical activity and nutrition information to parents.

In summary, teacher 5 improved the practices of making water available and encouraging water as well as providing nutrition and physical activity information to parents. Some negative practices that did not change were restricting active play as punishment and not participating in active play. Two negative practices that were not observed at baseline but were at follow up were using food as an incentive for good behavior and students remaining seated for greater than 15 minutes outside of nap and meal times.

Teacher 6

At baseline, Teacher 6 was mostly silent during meals. She responded to students’ comments and asked them to stay seated, but there was no discussion. She did not have the same food as the students at breakfast, but the breakfast she packed was healthy (oatmeal, nuts). She was drinking tea. In the classroom, there was a poster about the kids voting if they liked broccoli (but this was after the HCCG teacher training). Water was not available outdoors; it was only encouraged after coming in from outside play. One student asked for water during music and movement and was told no by the paraprofessional. Total physical activity observed was 40 minutes outside and 4 minutes indoors of music and movement (two songs). The teacher participated in music and movement, but student who were not participating were not encouraged further. Most posters in the classroom were about how to ask a question, how to

play with classmates, and the alphabet. Meals are usually consumed in the cafeteria where students socialize.

At midpoint, the students threw away their own cups and plates after an HCCG activity. The teacher sat with students at meals but did not eat. At breakfast, she drank coffee and at lunch she drank milk. There were several nutrition support materials on display in the classroom: heathy helpings game, “The Very Hungry Caterpillar” book, breakfast items poster, and a vegetable counting game. Students asking for water during the morning activity were denied, but they could get water after the activity. The teacher led a structured activity with a Congo line and song about fruit. Instead of withholding activity the teacher is using a behavior chart and is taking away the students’ choice at center time. About every 10 minutes the class stood up and did some movement. She has sent home the HCCG newsletters to provide physical activity and nutrition information to parents.

At follow up, students were responsible for throwing away their remaining food and putting their trays back. The teacher did not make much conversation with the students. At breakfast the teacher sitting with students, eating fast food (Bojangles), and drinking soda. She read a story about a family making a healthy dinner and counting all the vegetables. She lead 10 minutes of structured physical activity (fruit dance). Several nutrition support materials were on display, including: MyPlate poster, stuffed fruit and vegetable toys, and a book about water. No outdoor play time was observed. The teacher encouraged water at designated times during breaks and after certain activities. She used methods such as missing out on activities and moving the student name from green to red on a behavior chart to control behavior instead of

taking away outside play time. She used stickers to reward good behavior. She has sent home the HCCG newsletters to provide physical activity and nutrition information to parents.

In summary, teacher 6 improved the following practices: encouraging water, displaying nutrition support materials, providing nutrition and physical activity information to parents, and not restricting active play as a punishment. Some negative practices that did not change were not eating the same food as students and not talking about healthy foods with students during meals. Some positive practices that did not change were sitting with students at meals, involving students in meal time activities, and engaging in music and movement.

CHAPTER 5

DISCUSSION

The goal of this formative evaluation was to determine what barriers prevent teachers from implementing and modeling the obesity prevention best practices introduced by HCCG. Then, using goal setting and coaching, the researchers sought to improve teacher implementation and modeling and increase teacher self-efficacy to model healthy nutrition and physical activity behaviors. The hypothesis was that teacher goal setting and weekly coaching sessions would improve teacher modeling and implementation of the obesity prevention practices and policies and increase teacher self-efficacy to model healthy nutrition and physical activity behaviors. The themes that emerged from the qualitative analysis help to answer all three research questions with rich, unstructured data. The quantitative results help to strengthen the findings.

A previous study found that an educational intervention is not sufficient to align teacher behaviors with obesity prevention best practices (19). This project went a step further by seeking to motivate teachers and support them in behavior changes and classroom policies. This project utilized social cognitive theory as a theoretical framework and based the rationale for the intervention on the construct of observational learning (12). According to SCT, the three major factors that affect an individual's likelihood of changing a health behavior are: 1) goals; 2) self-efficacy; and 3) outcome expectancies (13).This intervention addressed all of these factors by working with the teachers to set goals, addressing teacher self-efficacy, and discussing outcome expectancies at the initial interview and coaching sessions. Motivational interviewing

is a counseling technique designed to elicit personal motivation for change by exploring and resolving ambivalence (16). The research team used a motivational interviewing technique to address and improve teacher self-efficacy to model healthy nutrition and physical activity. Motivational interviewing was used because it is an established method for supporting dietary and exercise behavior changes in individuals, specifically by improving self-efficacy (17).

Child eating behavior is known to be influenced by adult eating behaviors (10, 14, 15, 24). The 2017 report from the World Obesity Federation recommends that caregivers of children ages 2-5 years continue to introduce new, healthy foods with repeated exposures to children to promote child acceptance of the food (10). The report also recommends that caregivers model eating and enjoying healthy foods (nutrient rich) instead of unhealthy (nutrient poor) foods in front of children (10). These recommendations align with the goals of both HCCG and this study. HCCG uses a weekly taste test activity to expose preschoolers to five fruits and five vegetables. The students have an opportunity to try the foods once per week for the six weeks of the program (11). The taste test activity complies with the recommendation to continually introduce healthy foods across repeated exposures. By focusing on teacher modeling of best practices, this project promoted and supported teachers to model eating and enjoying of healthy, nutrient dense foods.

Barriers defined

The barriers that prevented this cohort of teachers from implementing and modeling the obesity prevention best practices include: time constraints of the school day, water being a distraction to students, a need for space to be active, the physical limitations of teachers,

teacher desire for caffeinated beverages, teacher responsibility to monitor students during outside play, and teachers forgetting best practice goals.

Changes in self-efficacy

Self-efficacy is defined as a person's situation-specific belief in his or her capabilities to perform a behavior (25). The thematic analysis supports that the goal setting and weekly coaching sessions improved teacher awareness and self-efficacy to model healthy nutrition and physical activity behaviors. Multiple teachers conveyed that goal setting and coaching made them more aware of their status as a role model for health behaviors. This was an expected finding, because the motivational interview focused on exploring that role model position with each teacher. Intuitively, it makes sense that asking teachers about their position as a role model during the initial interview would inspire them to consider that position and improve their behavior. Increased self-awareness is an important first step in behavior modification, so this was a positive finding.

The qualitative data from the follow up interviews indicate that the teachers felt increased capability to model health behaviors after the intervention. The teachers described their successes and confidence to model numerous health behaviors, including: consuming only healthy beverages (not soft drinks), eating healthy foods, sitting with students at meals and talking about food, and participating in physical activity. Multiple teachers were successful in achieving personal health behavior modifications.

Despite the positive findings regarding increased self-efficacy from the qualitative data, the quantitative self-efficacy ranking data from the CAN Teach survey indicated no significant changes in teacher self-efficacy from baseline to follow up. A retrospective pre-test, in which

the teachers would rank their baseline self-efficacy to model the behaviors after the intervention, may have been a better method for detecting changes in teacher self-efficacy to control for response shift bias. Response shift bias is a potential confounder of pre-test/post-test measurements that stems from the participants' shifting understanding or awareness of the variable being measured because of the intervention (26). Retrospective pre-tests help account for this response shift bias by assessing the participants' baseline knowledge after the intervention when they have learned more about the subject of interest. In the case of this study, the 6-week HCCG intervention which focused on teacher role modeling, nutrition best practices, and physical activity best practices may have made teachers more aware of the room for improvement they had in these areas. Consequently, the teachers may have reported lower or unchanged self-efficacy scores at follow up. Using a retrospective pretest in future research of this nature may help further elucidate changes (if any) that are occurring in teacher self-efficacy.

Changes in best practices

There were significant increases in the number of best practices being implemented and modeled at follow up compared to baseline for both nutrition and physical activity. Because there is no control group in this study, it is not possible to say from the quantitative data alone whether the increase in number of best practices is due to the goal setting and coaching or just due to the HCCG program alone. However, the qualitative data support that goal setting and coaching were effective tools which gave teachers specific direction, motivated them, kept them involved in the program, gave them support, and increased their self-efficacy to model nutrition and physical activity behaviors.

After the HCCG intervention, more teachers were doing the following at follow up compared to baseline: involving children in mealtime activities, modeling consumption of healthy beverages, providing nutrition education, displaying nutrition support materials in the classroom, encouraging water consumption throughout the day, providing nutrition information and resources to parents, leading 60 minutes of structured physical activity, providing physical activity education, displaying physical activity support materials in the classroom, and providing physical activity information and resources to parents.

It is not a surprising finding that teachers were more so able to provide nutrition education, display nutrition support materials in the classroom, provide nutrition information and resources to parents, provide physical activity education, display physical activity support materials in the classroom, and provide physical activity information and resources to parents. Those are all things that naturally go along with participation in the HCCG program if the teacher is compliant. For example, HCCG provides weekly newsletters to parents with information about nutrition and physical activity. If the teacher is compliant in sending those home, then the teacher would meet that best practice. Also, because HCCG provides teachers with numerous nutrition and physical activity support materials (books, toys, posters, games, etc.) it is again not surprising that the teachers improved at displaying such materials in their classrooms. Such improvements are the "low hanging fruit" of the HCCG intervention. These are important milestones to accomplish, but they require less involvement or investment on the teachers' part than other best practices.

Alternatively, improvements such as an increase in the number of teachers involving students in mealtime activities (2 at baseline vs. 6 at follow up), encouraging water

consumption throughout the day (0 at baseline vs. 2 at follow up), and leading 60 minutes of structured physical activity (0 at baseline vs. 1 at follow up), demonstrate a deeper level of teacher involvement in and adoption of HCCG obesity prevention best practices. These are practices that require extra awareness and energy from the teacher, so it is encouraging to see improvement in these areas.

No changes were observed from baseline to follow up in the number of teachers not encouraging a "happy plate," sitting with children and eating the same food as them at meals, making water available while outdoors, scheduling physical activity for 120 minutes per day, or participating with children in active play. At both time points, none of the six teachers encouraged a "happy plate," sat with children and ate the same food as them at meals, made water available while outdoors, or scheduled physical activity for 120 minutes per day.

Many teachers sat with their students during meals, but it was rarer for them to eat the same food and drink the same beverages. In Clarke County, teachers must pay if they want to eat lunch in the cafeteria, so they often bring in outside food or lunches packed from home. Thus, many of the teachers met half of the best practice by sitting with students but did not fully implement the best practice by not consuming cafeteria food. For the purposes of this study, a best practice was only indicated as "met" on the Best Practice Observation Survey if it was completely met, though the open-ended survey items allowed the researchers to note if teachers partially met best practices.

None of the teachers made drinking water available while outdoors, which is not unusual for preschool classrooms. Water is only typically available outside if there is a water fountain installed near the playground. Instead of bring water pitchers and cups outside, it is

common practice for teachers to bring students by the water fountain directly after outside play time to allow them to drink. It was unexpected that there was not an increase in this best practice, because two of the teachers set that as one of their action plan goals. One of the teachers had trouble with the students getting distracted by the water pitchers on the playground, so she decided to discontinue the practice of bringing water outside for the winter and said she would resume the practice in spring when the weather warms up.

At the HCCG teacher trainings, teachers often balk when they hear that scheduling physical activity for 120 minutes per day is a best practice. It seems to them like an unattainable amount of time given their packed schedule. The HCCG team attempts to soften the shock of the 120 minutes recommendation by demonstrating how physical activity can be incorporated into stories and transitions. This best practice seems to be one of the most difficult for teachers to implement.

Half (three) of the teachers were observed participating with children during active play at both baseline and follow-up. It was unexpected that there was no change in this best practice, because one of the teachers not participating in active play at baseline made that an action plan goal. We expected an increase of at least one teacher.

Fewer teachers were doing the following at follow up compared to baseline: talking with students about healthy foods, not using food as incentive for good behavior, gently encouraging students to try new foods, not withholding physical activity as punishment, students not seated for greater than 15 minutes, less than 30 minutes of screen time per week, and no TV watching during meals or snacks.

The decreases in number of teachers talking with students about healthy foods, not using food as incentive for good behavior, gently encouraging students to try new foods, not withholding physical activity as punishment, and not keeping students seated for greater than 15 minutes were minor. For each of those best practices, a difference of one teacher doing the practice was observed. With a small sample size, we do not have the ability to determine what is significantly different behavior and what is natural variation in the observation.

The decrease in limiting screen time to 30 minutes and not showing TV during meals or snack occurred in only one classroom. On the day of follow-up data collection for this teacher, the researcher observed the students eating lunch while watching a cartoon (for longer than 30 minutes). The teacher indicated that this was something they did once per nine weeks when report cards go home. Thus, the time of observation skewed the observation, since showing cartons over lunch once per nine weeks was a practice that was in place all along (maintained negative practice).

The open-ended field notes from the best practice observations show that, overall, most teachers had improvements in a few best practices while maintaining some positive and some negative practices. Only one teacher was observed doing two negative practices at follow up that were not observed at baseline, but there was no midpoint data for this teacher, so it is unclear whether or not these practices were already in place. These are encouraging findings, because they indicate that the intervention was successful at improving some best practices. The findings also demonstrate room for improvement, since some teachers maintained negative practices throughout the intervention. One possibility to address this would be to continue the coaching over a few years. This would give the teachers time to work their way up

to doing all of the best practices in their classrooms. It is unreasonable to expect a teacher to make numerous practice changes all at once.

Strengths

This study has many strengths. First, the mixed-methods design offers a full picture of the situation by providing both more objective and rich observational data. There was integrity in the data collection and analysis, as evidenced by the researcher's subjectivity statement. Data triangulation via field notes, surveys, and interviews was used to ensure accuracy of the findings. Also, the researchers had one on one relationships with the teachers and were able to build rapport over the study. This rapport facilitated the coaching process, helped teachers feel supported, streamlined communication, and fostered trust. This project was significant because motivating and supporting teachers to become healthy role models has the potential to increase the efficacy of HCCG. The approach was innovative because it was teacher-focused and involved coaching for behavior modification. The project helped the research team understand that goal setting and coaching teachers in this context is an effective tool for the prevention of childhood obesity.

Limitations

Because there were a limited number of teachers participating in the HCCG intervention, the sample size of this study was small. The HCCG program is only six weeks long, making this a short-term intervention. It may be hard to see substantial changes in teacher behaviors and practices within this limited time frame. Though working within the design and time frame of the greater HCCG project limited the intervention may be limitations, the purpose of this project, as a formative evaluation, was to specifically inform the HCCG project.

Therefore, the sample size and time frame are not true limitations. Sometimes the teachers were not able to fully participate in the weekly coaching session. This occurred on observation days when teachers were either absent or extremely busy. Coaching on those days was not feasible or cut short. The researchers believe that this project fulfilled its intended function despite the limitations.

Future research

As stated above in the methods section, this study was a formative evaluation designed to improve the efficacy of the HCCG program by encouraging teachers to role model and implement obesity prevention best practices. There is no intention to generalize these findings beyond the setting of the HCCG program. Future research is needed to identify other barriers and to determine if the barriers to best practices identified by the six teachers in this study are common barriers elsewhere in the state and country. Understanding the barriers to best practices is important, because that understanding will enable researchers and organizations to enhance and tailor interventions and programs to address potential barriers. By addressing barriers, programs and interventions will have greater opportunities for success and higher levels of implementation.

Additional research is also needed to determine what strategies are effective for modifying the behaviors and practices of teachers. In this group of six teachers, the researchers found that goal setting, motivational interviewing, and weekly coaching were efficacious tools to improve best practice implementation and modeling. It would be valuable to know if these strategies work in other situations. Because preschool teachers are the gatekeepers to the health of our nation's children, it is important that researchers invest time and effort in

identifying strategies to reach teachers and empower them become positive health role models.

Finally, more work is needed in this area of understanding how to enhance teacher self-efficacy to model nutrition and physical activity behaviors. This is necessary because increased self-efficacy is needed in order to bring about observable behavioral changes in teachers.

CHAPTER 6

CONCLUSION

In an effort to alleviate and hopefully someday eliminate the burden of childhood obesity, it is desirable to increase the number of obesity prevention best practices being implemented and modeled in preschool classrooms. During this key time in human development, preschool students are impressionable and developing habits which they will continue throughout life. There are numerous barriers that hinder teachers from implementing and modeling best practices for obesity prevention in their classrooms. These barriers identified by this formative evaluation include: time constraints of the school day, water being a distraction to students, a need for space to be active, the physical limitations of teachers, teacher desire for caffeinated beverages, teacher responsibility to monitor students during outside play, and teachers forgetting best practice goals. These barriers must be overcome in order to make the preschool classroom a healthier place.

The quantitative findings indicate no significant difference in teacher self-efficacy from baseline to follow up. However, the researcher concludes from the qualitative findings that teacher self-efficacy to model healthy eating and physical activity behaviors increased due to the goal setting and coaching, because teachers expressed increased self-efficacy in the follow up interviews. Together the quantitative and qualitative data support that goal setting and coaching as adjuncts to the HCCG program were effective tools to improve teacher implementation and modeling of obesity prevention best practices.

REFERENCES

1. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011-2012. (1538-3598 (Electronic)).
2. Cheung PC, Cunningham SA, Narayan KMV, Kramer MR. Childhood Obesity Incidence in the United States: A Systematic Review. Childhood Obesity 2015;12(1):1-11. doi: 10.1089/chi.2015.0055.
3. Monica Kazlausky Esquivel, Claudio R. Nigg, Marie K. Fialkowski, Kathryn L. Braun, Fenfang Li, Novotny R. Influence of Teachers' Personal Health Behaviors on Operationalizing Obesity Prevention Policy in Head Start Preschools: A Project of the Children's Healthy Living Program (CHL). Journal of Nutrition Education and Behavior 2016;48(5):318-25.
4. 2015 – 2020 Dietary Guidelines for Americans. 8th Edition ed: US Department of Health and Human Services, US Department of Agriculture. , 2015.
5. Bowman SA, Clemens JC, Friday JE, Moshfegh AJ, Lynch KL, LaComb RP. Food Patterns Equivalents Intakes by Americans: What We Eat in America, NHANES 2003-04 and 2013-14 Food Surveys Research Group, 2017.
6. American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education. Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs 3rd ed, 2011.
7. McGuire S. Institute of Medicine (IOM) Early Childhood Obesity Prevention Policies. Washington, DC: The National Academies Press; 2011. Advances in Nutrition 2012;3(1):56-7. doi: 10.3945/an.111.001347.
8. Mamedova S RJ. Early Childhood Program Participation, From the National Household Education Surveys Program of 2012. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, 2015.
9. Larson N WD, Neelon SB, Story M. What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts. J Am Diet Assoc 2011;111(9):1343-62.
10. Anzman-Frasca S, Ventura AK, Ehrenberg S, Myers KP. Promoting healthy food preferences from the start: a narrative review of food preference learning from the prenatal period through early childhood. Obesity Reviews 2018;19(4):576-604. doi: 10.1111/obr.12658.
11. Cotwright CJ, Bales DW, Jung Sun L, Parrott K, Celestin N, Olubajo B. Like Peas and Carrots: Combining Wellness Policy Implementation With Classroom Education for Obesity Prevention in the Childcare Setting. Public Health Reports 2017;132:74S-80S. doi: 10.1177/0033354917719706.
12. Bandura A. Social foundations of thought and action. 1986.
13. Institute NC. Theory at a glance: A guide for health promotion practice. 2005.
14. Addessi E, Galloway AT, Visalberghi E, Birch LL. Specific social influences on the acceptance of novel foods in 2-5-year-old children. Appetite 2005;45(3):264-71. doi: 10.1016/j.appet.2005.07.007.

15. Hendy HM, Raudenbush B. Effectiveness of teacher modeling to encourage food acceptance in preschool children. Appetite 2000;34(1):61-76. doi: 10.1006/appe.1999.0286.
16. Hettema J, Steele J, Miller WR. Motivational interviewing. ANNUAL REVIEW OF CLINICAL PSYCHOLOGY 2005;1:91-111.
17. Martins RK MD. Review of motivational interviewing in promoting health behaviors. Clin Psychol Rev 2009;29(4):283-93.
18. Dev DA, McBride BA, Speirs KE, Donovan SM, Cho HK. Research: Predictors of Head Start and Child-Care Providers' Healthful and Controlling Feeding Practices with Children Aged 2 to 5 Years. Journal of the Academy of Nutrition and Dietetics 2014;114:1396-403. doi: 10.1016/j.jand.2014.01.006.
19. Freedman M. R., Alvarez K. P. Research: Early Childhood Feeding: Assessing Knowledge, Attitude, and Practices of Multi-Ethnic Child-Care Providers. Journal of the American Dietetic Association 2010;110:447-51. doi: 10.1016/j.jada.2009.11.018.
20. Erinosho TO, Hales DP, McWilliams CP, Emunah J, Ward DS. Nutrition Policies at Child-Care Centers and Impact on Role Modeling of Healthy Eating Behaviors of Caregivers. Journal of the academy of nutrition and dietetics 2012;112(1):119-24.
21. Patton MQ. Qualitative evaluation and research methods. 2nd ed: Sage Publications, 1991.
22. International Q. Internet: http://www.qsrinternational.com/nvivo/what-is-nvivo 2018).
23. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative Research in Psychology 2006;3(2):77-101. doi: 10.1191/1478088706qp063oa.
24. Hendy HM. Comparison of five teacher actions to encourage children's new food acceptance. Ann Behav Med 1999;21(1):20-6. doi: 10.1007/bf02895029.
25. Bandura A. Self-efficacy. Encyclopedia of Human Behavior, 1994:71-81.
26. George SH. Response-Shift Bias: A Problem in Evaluating Interventions with Pre/Post Self-Reports. Evaluation Review 1980;4(1):93-106. doi: 10.1177/0193841X8000400105.

APPENDIX A

ACTION PLAN FORM

1. **The Nutrition Best Practice we have chosen is_____.**

What steps will we take to reach our goal?	**When** will we do it?	**Who** will do it?	**How** will we know it's done?	**Date Completed**

2. **The Physical Activity best practice we have chosen is_____.**

What steps will we take to reach our goal?	**When** will we do it?	**Who** will do it?	**How** will we know it's done?	**Date Completed**

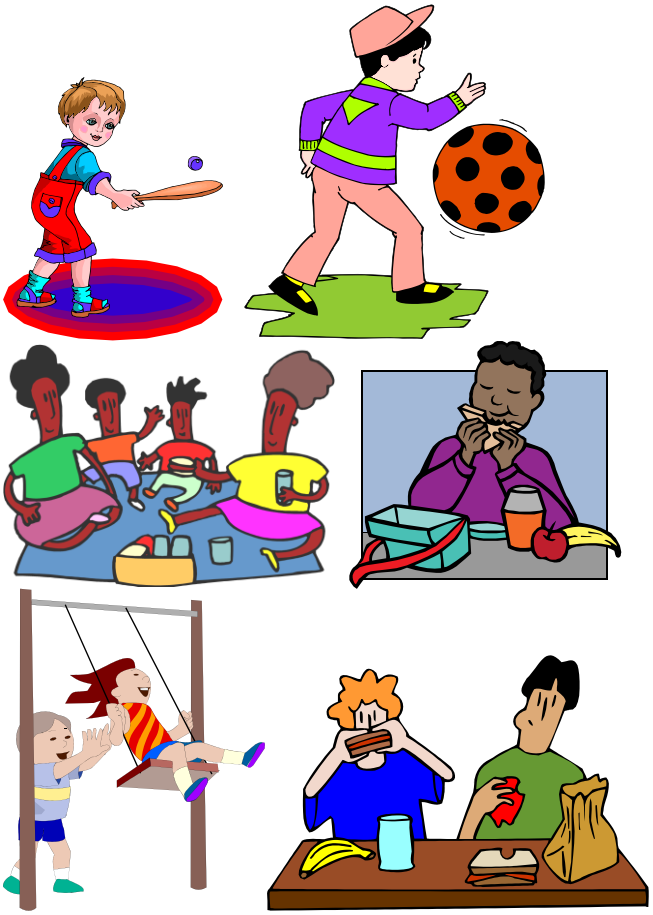
CAN TEACH SURVEY

This questionnaire has 3 sections on the following 6 pages. Please take about 20 minutes to answer the questions with your best guess of the response that fits what you think.

Name: _____

All responses will be kept confidential and reported only as group data. Completion of the questionnaire implies consent.

Thank you for your input!



Section 1: Please read each statement; circle the response that you think is the best choice. Any questions can go next to the item or there is space for comments at the end.

1. When planning for active playtime you should include activities such as ___.
    a. Books about healthy choices
    b. Coloring and painting
    c. Sandbox play
    d. Tricycle riding

2. The correct amount of screen time children under 2 years should be allowed is ___.
    a. None
    b. 20 minutes
    c. 30 minutes
    d. 40 minutes

3. The limit for how much juice a child should drink is____ per day.
    a. 10-12 ounces
    b. 6-8 ounces
    c. 4-6 ounces
    d. 8-10 ounces

4. A baby should be exclusively breastfed for ____ months.
    a. 3 months
    b. 4 months
    c. 5 months
    d. 6 months

5. All of the following are recommended to help preschoolers eat vegetables EXCEPT ___.
    a. Promise dessert when vegetables are eaten
    b. Offer new vegetables with familiar foods
    c. Serve vegetables undercooked and crunchy
    d. Show them you like vegetables

6. Children 2 years and older should drink ___.
    a. Whole Milk
    b. 2% Milk
    c. 1% or Non fat (Skim) Milk
    d. Flavored Milk

7. To help an overweight preschooler get to a healthy weight, ____.
    a. Forbid any foods that fit into the 'junk food' category
    b. Offer fruits, vegetables, and whole grains more often
    c. Put the preschooler on a calorie restricted diet
    d. Stop offering snacks between meals

8. Water should be_____.
    a. Served only at lunch time
    b. Visible and available inside and outside for self-serve
    c. Served only during outside time
    d. Limited to requests to go to the water fountain

9. Physical activity for **preschoolers** should add up to at least _____ minutes a day.
    a. 20
    b. 60
    c. 90
    d. 120

10. When would it be an appropriate punishment to take away active playtime?
    a. Any time
    b. 2-3 times a day at most
    c. Once a day
    d. Never

11. A healthful set of food rules would include which of the following?
    a. Discipline the preschooler if he or she refuses to taste foods
    b. Keep offering new foods at different meals
    c. Expect preschoolers to eat everything on their plate
    d. Require preschoolers to eat, not talk, during mealtimes

12. Now, tell us how interested you are in learning about the following topics. *Circle the number that fits for you.*

1 = Not at all **2** = I probably should, but am not sure I want to **3** = Some interest to learn new things **4** = Yes, ready to learn & practice **5** = Already actively learning new things in this area

Healthy child growth & development	1	2	3	4	5	☐
Nutrition for young children	1	2	3	4	5	☐
Physical Activity for young children	1	2	3	4	5	☐

If you want us to get back to you individually on any topic, check the topic box ☐

Section 2: Please read each statement; circle the number that best represents your degree of confidence in doing that task whether or not it is part of your current job responsibilities.

1 Not confident **4 Moderately confident** **7 Highly confident**

I. *Rate your degree of confidence that you can do the following health and development practices:*	Degree of ← Confidence →
Monitor children's health status	1 2 3 4 5 6 7
Integrate support for nutrition education into center practices	1 2 3 4 5 6 7
Ensure safe areas for children to engage in large muscle movement	1 2 3 4 5 6 7
Recommend policy change or organizational change to promote children's health	1 2 3 4 5 6 7
Ensure meal pattern requirements of the USDA Child & Adult Care Food Program (CACFP) are met	1 2 3 4 5 6 7
Continue your own professional development to teach nutrition & physical activity topics	1 2 3 4 5 6 7
Ensure the environment supports family-style meals	1 2 3 4 5 6 7

II. *Rate your degree of confidence as a teacher to do the following:*	Degree of ← Confidence →
Lead children in structured physical activity	1 2 3 4 5 6 7
Design physical activity opportunities or activities	1 2 3 4 5 6 7
Include dance and free movement activities as part of classroom free play and structured group time	1 2 3 4 5 6 7
Provide nutrition learning experiences with foods of different tastes, smells, textures; including familiar and new foods	1 2 3 4 5 6 7
Coordinate nutrition education during mealtimes and during curricular activities	1 2 3 4 5 6 7
Teach children about different foods, including a focus on healthy foods from different cultures and traditions	1 2 3 4 5 6 7
Teach children about meal preparation, service, and clean-up	1 2 3 4 5 6 7
Use food and cooking methods to teach other subjects, e.g. early math and science concepts (colors, patterns, sequencing, energy, growth)	1 2 3 4 5 6 7
Integrate nutrition into different forms of presentations, such as science activities, imaginative play	1 2 3 4 5 6 7

Teach children about gardening and food systems, such as local farms, how climate impacts growing foods and conservation	1 2 3 4 5 6 7
Plan structured physical activity for preschoolers for at least 60 minutes during the day	1 2 3 4 5 6 7
Teach locomotor skills and traveling actions (jumping, galloping, hopping)	1 2 3 4 5 6 7
Teach ball and other object control skills	1 2 3 4 5 6 7
Teach active play skills (bike riding, sliding, swinging, climbing)	1 2 3 4 5 6 7
Teach rhythm and balance skills	1 2 3 4 5 6 7

1 Not confident **4 Moderately confident** **7 Highly confident**

III. *Rate your degree of confidence completing the following daily activities with food and physical activity:*	Degree of ← Confidence →
Practice safe food handling at all times	1 2 3 4 5 6 7
Encourage social interaction and conversation about the foods and events of the day during mealtime	1 2 3 4 5 6 7
Avoid verbal or non-verbal prompts to eat that over-ride children's internal cues during mealtime	1 2 3 4 5 6 7
Limit children's sedentary behaviors to less than 60 minutes at a time, except when sleeping	1 2 3 4 5 6 7
Limit screen time to 30 minutes or less a week	1 2 3 4 5 6 7
Schedule daily large motor/muscle activity time (indoor and outdoor)	1 2 3 4 5 6 7
Model healthy eating behaviors for children	1 2 3 4 5 6 7
Model physical activity/ movement behaviors	1 2 3 4 5 6 7
Make use of the environment and available equipment for active play and physical activity	1 2 3 4 5 6 7

IV. *Rate your degree of confidence with involving community members with children's health goals:*	Degree of ← Confidence →
Engage parents as partners in children's nutrition & physical activity education	1 2 3 4 5 6 7
Educate parents about nutritious foods and healthy habits	1 2 3 4 5 6 7
Educate parents about appropriate and safe forms of and times for physical activity	1 2 3 4 5 6 7
Make health education activities available to parents for home use	1 2 3 4 5 6 7
Include health and nutrition information in parent handbook	1 2 3 4 5 6 7
Refer children and their families to health or social services	1 2 3 4 5 6 7

Section 3. *List the number that shows how you rate your readiness to learn new information to help with your teaching:*

1 = None at all
2 = I probably should, but am not sure about it
3 = Some interest to learn new things
4 = Yes, ready to learn & practice
5 = Already learning

Integrate at least one new wellness best practice in your preschool setting _____

Deliver curriculum for nutrition _____

Deliver curriculum for large motor activity _____

Plan and lead large group activities _____

Lead structured outdoor active play _____

Plan and lead activities that can be integrated into various subjects (math, art, science, dramatic play) _____

Section 3: Education (check the highest level achieved): High school diploma ___, Associate's degree ____, Baccalaureate Degree ____, Graduate Degree ____, Other _____

Your position: Head Teacher ___, Teacher ___, Assistant___, Other _____

Years in field: _____ Age: _____ years **Sex:** Male _____ Female _____

Teacher code: _____
Date: _____
Time: _____

Eating Environment

- ☐ 1.1 Children are never encouraged to eat more than they want and are never asked to "clean their plate" or "make a happy plate".

- ☐ 1.2 Preschoolers are actively involved in mealtime activities, such as cleaning the table every day.

- ☐ 1.3 Caregivers talk informally about healthy foods during meals and reinforce children's internal cues of hunger and fullness every day.

Additional observations:
_____
_____
_____
_____
_____
_____

Caregiver Behaviors

- ☐ 2.1 Caregivers never offer food incentives for good behavior (like sweets, or food-related parties).

- ☐ 2.2 Caregivers gently encourage, but do not force, children to try all food components offered at meals and snacks every day.

- ☐ 2.3 Caregivers sit with children during meals and snacks, and eat the same foods as the children every day.

- ☐ 2.4 In front of the children, caregivers only drink healthy beverages like water, low-fat milk and 100% juice every day.

Additional observations:
_____
_____
_____
_____

_____
_____

Nutrition Education

- ☐ 3.1 Formal nutrition education is provided through curricula, games, lessons and/or books at least once per week.

- ☐ 3.2 Culturally appropriate nutrition support materials including pictures, posters, and play materials like books or toys that promote healthy eating are displayed in several areas of the classroom.

Additional observations:

_____
_____
_____
_____
_____
_____

Beverages

- ☐ 4.3 Drinking water is available during outdoor play, and caregivers encourage children to drink water every day.

- ☐ 4.4 Caregivers encourage children 1 year and older to drink water many times throughout the day.

Additional observations:

_____
_____
_____
_____
_____
_____

Caregiver and Parent Nutrition Training

- ☐ 5.4 Parent handouts, brochures, or newsletters that include nutrition information are provided twice per year or more.

Additional observations:

_____
_____
_____
_____
_____
_____

Scheduled Physical Activity

- ☐ 1.2 Total physical activity time, both indoors and outdoors, for preschoolers, including those with special needs, is scheduled for 120 minutes or more per 8 hour day (or 60 minutes per 4 hour day).

- ☐ 1.4 Structured, or teacher-led, physical activity for preschoolers, including those with special needs, is scheduled for 60 minutes or more per 8 hour day (or 30 minutes per 4 hour day).

Additional observations:

_____
_____
_____
_____
_____
_____

Caregiver Behaviors

- ☐ 2.1 Physical activity time is never withheld as punishment when children are misbehaving.

- ☐ 2.2 Caregivers participate in active play and encourage children to be active every day.

Additional observations:

_____
_____
_____
_____
_____
_____

Physical Activity Education

- ☐ 3.1 Formal physical activity education is provided through curricula, games, lessons and/or books at least once per week.

- ☐ 3.2 Culturally appropriate physical activity support materials including pictures, posters, and play materials like books or toys that promote physical activity are displayed in several areas of the classroom.

Additional observations:

_____
_____
_____
_____
_____
_____

Sedentary Activity

- ☐ 4.1 During a typical day, not counting naps and meals, toddlers and preschoolers are expected to remain seated for no more than 15 minutes at a time.

Additional observations:

_____
_____
_____
_____
_____
_____

Screen Time

- ☐ 5.2 For children over the age of 2 years, total screen time, including television, videos, DVDs, and computer time is limited to 30 minutes or less per week.

- ☐ 5.3 Television, video or DVD viewing is never permitted during meals or snacks.

Additional observations:

_____
_____
_____
_____
_____
_____

Caregiver and Parent Physical Activity Training

- ☐ 6.4 Parent handouts, brochures, or newsletters that include physical activity information are provided twice per year or more.

Additional observations:

_____
_____
_____
_____
_____
_____

INTERVIEW PROTOCOLS

Teachers will be interviewed twice (at baseline and follow-up) for the purposes of this study. The following questions will be posed to the teachers during the interviews.

"Thank you for taking the time to meet with me. From this interview, I hope to get a better picture of how you view your role in the classroom for obesity prevention and understand how I can best support you in reaching your action plan goals."

Initial interview

Section 1: Modeling

"To start off with, I want to understand more about how you model behaviors in your classroom."

1. How do you perceive yourself as a role model to your students?

Prompt a. Do your students observe and learn from your behaviors? What does that look like?

2. You ranked your degree of confidence in your ability to model physical activity/movement behaviors for your students as _ out of 7. Please elaborate on why you picked that number. What may increase your confidence in that area?

Prompt a. What may prevent you from modeling physical activity? What would help you model more physical activity?

3. You ranked your degree of confidence in your ability to model healthy eating behaviors for your students as _ out of 7. Please elaborate on why you picked that number? What may increase your confidence in that area?

Prompt a. What may prevent you from modeling healthy eating? What would help you model more healthy eating?

Section 2: Action plan goals

Provide the teacher with a copy of the action plan he or she created during the training.
"I'd like to move on to the goals we are going to be working toward in the next 6 weeks."

1. In your action plan, you set the nutrition-related best practice goal of _____.

a. Describe what it would look like for your classroom to reach this goal? What may happen as a result of reaching this goal (visualize success)?

b. What are some things about reaching this goal that may be difficult (identify barriers)?

c. How can **we** (emphasize partnership) work past these barriers to achieve your goals?

Prompt a. What type of supports or materials would be helpful to you?

2. In your action plan, you set the physical activity-related best practice goal of _____.

a. Describe what it would look like for your classroom to reach this goal? What may happen as a result of reaching this goal (visualize success)?

b. What are some things about reaching this goal that may be difficult (identify barriers)?

c. How can **we** (emphasize partnership) work past these barriers to achieve your goals?

Prompt a. What type of supports or materials would be helpful to you?

Notify the teacher of the monitoring plan;
"Each week I will touch base to keep track of where we are at in reaching these goals so we can work through any hurdles that may come up."

Using the action plan sheet as a guide, set clear next steps about what is needed from the teacher, and what individualized resources/support the researcher will be providing to the teacher.

Provide researcher contact information and answer any questions the interviewee has.

Follow-up interview

"Thank you for taking the time to meet with me. I greatly appreciate all the time and effort you have put into the HCCG program these past 7 weeks. From this interview, I hope to understand what the coaching and goal-setting portions of the program were like for you."

1. What was your experience with the goal-setting and weekly coaching aspects of the HCCG program?

Prompt a. Was the coaching useful for you? In what ways was it useful, and how could it be better?

Prompt b. How did setting goals help you implement and teach the HCCG program in your classroom?

2. Describe your progress in reaching your best practice goals.

3. Other teachers mentioned that they were able to reach their goals due to…What things made it possible for you to reach your best practice goals (facilitators)?

4. Some things that may hinder progress include…What things hindered your progress toward your best practice goals (barriers)?

5. Has your modeling of physical activity/movement behaviors for your students changed? If so, how and why has it changed?

6. Has your modeling of healthy eating behaviors for your students changed? If so, how and why has it changed?

7. How do you perceive yourself as a role model to your students?

Healthy Child Care Georgia

Best Practices Checklist

Nutrition Practices

- ☐ Children are never encouraged to eat more than they want, and are never asked to "clean their plate" or "make a happy plate".
- ☐ Preschoolers are actively involved in mealtime activities, such as setting and cleaning the table every day.
- ☐ Caregivers talk informally about healthy foods during meals, and reinforce children's internal cues of hunger and fullness every day.
- ☐ Caregivers never offer food incentives for good behavior (like sweets, or food-related parties).
- ☐ Caregivers gently encourage, but do not force, children to try all food components offered at meals and snacks every day.
- ☐ Caregivers sit with children during meals and snacks, and eat the same foods as the children every day.
- ☐ In front of the children, caregivers only drink healthy beverages like water, low-fat milk and 100% juice every day.
- ☐ Formal nutrition education is provided through curricula, games, lessons and/or books at least once per week.
- ☐ Culturally appropriate nutrition support materials including pictures, posters, and play materials like books or toys that promote healthy eating are displayed in several areas of the facility.
- ☐ Sugar sweetened beverages, like soda, juice drinks, sports drinks, sweet tea and Kool-Aid® are never served.
- ☐ 100% juice is served twice per week or less.
- ☐ Drinking water is available during outdoor play, and caregivers encourage children to drink water every day.
- ☐ Caregivers encourage children 1 year and older to drink water many times throughout the day.
- ☐ A registered dietitian or qualified nutritionist is consulted at least once per year to ensure a variety of healthy, appealing and age-appropriate foods are served.
- ☐ Nutrition training for caregivers is provided twice per year or more.
- ☐ Nutrition training for parents is provided twice per year or more.
- ☐ Parent handouts, brochures, or newsletters that include nutrition information are provided twice per year or more.

Physical Activity Practices

☐ Total physical activity time, both indoors and outdoors, for toddlers, including those with special needs, is scheduled for 90 minutes or more per 8 hour day (or 45 minutes per 4 hour day).

☐ Total physical activity time, both indoors and outdoors, for preschoolers, including those with special needs, is scheduled for 120 minutes or more per 8 hour day (or 60 minutes per 4 hour day).

☐ Structured, or teacher-led, physical activity for toddlers, including those with special needs, is scheduled for 30 minutes or more per 8 hour day (or 15 minutes per 4 hour day).

☐ Structured, or teacher-led, physical activity for preschoolers, including those with special needs, is scheduled for 60 minutes or more per 8 hour day (or 30 minutes per 4 hour day).

☐ Physical activity time is never withheld as punishment when children are misbehaving.

☐ Caregivers participate in active play and encourage children to be active every day.

☐ Formal physical activity education is provided through curricula, games, lessons and/or books at least once per week.

☐ Culturally appropriate physical activity support materials including pictures, posters, and play materials like books or toys that promote physical activity are displayed in several areas of the facility.

☐ During a typical day, not counting naps and meals, toddlers and preschoolers are expected to remain seated for no more than 15 minutes at a time.

☐ Children under the age of 2 years are never permitted to watch television, videos or DVDs.

☐ For children over the age of 2 years, total screen time, including television, videos, DVDs, and computer time is limited to 30 minutes or less per week.

☐ Television, video or DVD viewing is never permitted during meals or snacks.

☐ A qualified expert in early childhood physical activity is consulted at least once per year to ensure a variety of fun and age-appropriate physical activities are provided.

☐ Physical activity training for caregivers is provided twice per year or more.

☐ Physical activity training for parents is provided twice per year or more.

☐ Parent handouts, brochures, or newsletters that include physical activity information are provided twice per year or more.