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### Child Care Teachers' Knowledge of Fun Physical Activities and Healthy Food Choices For Pre-School Children

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Child Care Teachers' Knowledge of Fun Physical Activities and Healthy Food Choices  
For Pre-School Children

by

Liz Gwyn

A capstone project submitted to the faculty of  
Gardner-Webb University Hunt School of Nursing  
in partial fulfillment of the requirements for the degree of  
Doctorate of Nursing Practice

Boiling Springs, NC

2018

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## Abstract

The focus of this project was to explore child-care teachers' knowledge of fun physical activities and healthy food choice activities for preschool children. A four-week educational session was implemented in a rural child-care center. The intervention provided education in relationship to the implementation of fun physical activities and healthy food choice activities for child-care teachers during preschoolers structured playtime. The Child Care Teachers' Knowledge Evaluation (CCTKE) tool developed by the doctoral student was used to collect responses from participants before and after the intervention. The participants' data was analyzed using a *t*-test. There were no statistically significant differences between the pre-test and post-test *t* scores for the educational sessions. While the means and standard deviations for physical activities, parental teaching, teacher role model, and teacher research showed a slight difference in knowledge after the educational sessions. The implementation of similar educational sessions will likely be necessary to effectively educate child-care teachers to promote healthy behaviors in the preschool classrooms.

*Keywords:* DNP project, child-care teachers, preschooler, physical activity, healthy food choices, obesity, nurse

## Acknowledgements

I thank my Heavenly Father, King Jesus, and precious Holy Spirit for taking me on this unexpected journey. I appreciate Dr. Ashley Isaac-Dockery and Dr. Cindy Miller for the consistent, patient guidance given to me throughout this process. I am so grateful for Dr. Kathy Hicks and Dr. Gina DeCelle for being my supportive chair committee. I especially could not have done this without my amazing classmate Sherri Carter coaching me on. I give a big clap and hug to my husband Timothy and my daughters Tabitha Childress and Jessi Creed for staying by my side through *all* of my educational journeys. You are the best! Thanks to my son-in-laws, Eddie Childress and Jonathan Creed for making me laugh so much while I was “getting smarter”. Blessings to my little Neena-babies: Kaydence, Mila, Jude, and all those to come. I cannot forget the inspiration and role model I have loved as a close friend for many years, Dr. Cathy Franklin-Griffin! I greatly admire Dr. Cathy! I thank Dr. Mary Alice Hodge for putting up with my confusion and letting me whine. Thanks to all of my Facebook friends for cheering me on. Finally, thanks to my brother Roy and sisters, Dorothy and Barbara for being strong and intelligent siblings.

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TABLE OF CONTENTS

INTRODUCTION ..... 1

SECTION I: PROBLEM RECOGNITION

    Problem Statement ..... 2

    Need Identification..... 2

    PICOT Statement ..... 3

SECTION II: NEEDS ASSESSMENT

    Literature Review..... 4

        Contributing Factors to Obesity..... 4

        Role of the Childcare Teacher ..... 12

    Population/Community ..... 14

    Sponsor and Stakeholders ..... 18

    SWOT Analysis ..... 19

    Assess Available Resources..... 19

    Desired and Expected Outcomes ..... 21

    Team Selection..... 21

    Cost/Benefit Analysis ..... 22

    Define Scope of Problem ..... 22

SECTION III: GOALS, OBJECTIVES, AND MISSION STATEMENT

    Goals ..... 23

    Objectives ..... 24

    Mission Statement..... 24

## SECTION IV: THEORETICAL FRAMEWORK

Theoretical Underpinnings/Support Project Framework .....	25
---	----

## SECTION V: WORK PLANNING

Project Proposal .....	28
------------------------	----

Methodology .....	28
-------------------	----

Project Management Tools .....	29
--------------------------------	----

Budget .....	31
--------------	----

## SECTION VI: EVALUATION PLANNING

Evaluation Planning .....	32
---------------------------	----

Logic Model.....	33
------------------	----

Quality Improvement Methods .....	35
-----------------------------------	----

## SECTION VII: IMPLEMENTATION

Implementation .....	37
----------------------	----

Threats and Barriers .....	43
----------------------------	----

## SECTION VIII: INTERPRETATION OF DATA

Qualitative Data .....	45
------------------------	----

Quantitative Data .....	46
-------------------------	----

Process Improvement Data .....	48
--------------------------------	----

Discussion of Findings.....	48
-----------------------------	----

Conclusion .....	49
------------------	----

REFERENCES .....	50
------------------	----

## APPENDICES

A: Child Care Teacher's Knowledge (CCTKE) .....	59
B: Program Evaluation Survey .....	61
C: Categorical Results.....	62

## List of Tables

Table 1: County Statistics .....	17
Table 2: SWOT Analysis .....	19
Table 3: Project Timeline.....	30
Table 4: Logic Model.....	34

## List of Figures

Figure 1: Gantt Chart .....	29
-----------------------------	----

## INTRODUCTION

An extensive amount of research has been done to combat the problem of childhood obesity. Although the health care provider is one way to affect this problem, his or her time with children is very limited. Child-care teachers have access to children on a regular basis and spend extended time with them. Teachers are “gatekeepers” therefore, they are in a better position to consistently influence healthy behaviors in children (Copeland, Kendeigh, Saelens, Kalkwarf, & Sherman, 2011, p. 81).

Significant factors that impact the alarming rise of obesity rates in children are activity levels, food choices, and sedentary behaviors. Evidence suggests it is vital to promote physical activity and healthy eating for children to prevent obesity. This strategy will help launch a platform of healthy lifetime habits (Copeland et al., 2011; U.S. Department of Agriculture, 2010).

## **SECTION I**

### **PROBLEM RECOGNITION**

#### **Problem Statement**

Despite the clear identification of needs and recommendations by North Carolina's Healthy Weight and Healthy Communities 2013-2020 (NC2013-2020), Healthy People 2020 (HP2020), and the Centers for Disease Control and Prevention (CDC), target goals continue to fall behind. Providers have limited time during patient encounters and this diminishes or eliminates the teaching opportunities at each visit for prevention education. Strategies to prevent obesity in children must be consistently provided. The purpose of this project was to provide an educational intervention to teach child-care teachers fun physical activities and fun healthy food choice activities for preschoolers.

#### **Need Identification**

Childhood obesity continues to be a steadily rising health concern in the United States. The risk for morbidity and mortality rates in adulthood are a major concern for children. Obesity rates in children 2-19 years of age have increased from 10.0% in 1988 to 17.2% in 2014 (U.S. Department of Health and Human Services [USDHHS], 2016). Obesity in children is determined by a body mass index (BMI) for age at or above the 95<sup>th</sup> percentile for people of the same sex and age (USDHHS, 2016). Olshansky et al. (2005) declares childhood obesity is severe, placing American children at a higher risk of unhealthy and shorter lives than their parents. Ponder and Anderson (2008) reported providers have gradually shifted from prescribing diets for patients, to teaching healthy lifestyle options. However, in the clinical setting it is very difficult for practitioners "to

find the time to address the overwhelming and time-consuming issue of pediatric obesity” (Ponder & Anderson, 2008, p. 50). Olshansky et al. (2005) made it clear “unless effective population-level interventions to reduce obesity are developed” (p. 1143), the pediatric population is at an increased risk of being affected the most by obesity (Strauss & Pollack, 2001). Nurses are essential in working with families to prevent obesity, but child-care teachers may have the greatest impact on promoting healthy behaviors in children. Over 50% of children in child-care centers are not getting the recommended daily levels of physical activity (Copeland et al., 2011). Because teachers set the schedules and make the important decision of how and when activity will be provided, “they serve as [the] gatekeepers to the playground” (Copeland et al., 2011, p. 81).

#### **PICOT Statement**

The practice concern for this project was child-care teachers’ lack of knowledge related to fun activities that promote exercise and healthy food choices for children. This lack of knowledge creates a barrier to the development of healthy habits in children. The Population-Intervention-Comparison-Outcome (PICO) for this project was that child-care teachers would be provided an educational intervention and complete a pre-intervention and post-intervention survey. Child-care teachers demonstrated increased knowledge of fun activities to promote exercise and healthy food choices for children.

## **SECTION II**

### **NEEDS ASSESSMENT**

#### **Literature Review**

Prevention education is critical in the reduction of obesity for children in the United States (U.S.). Globally, it has been estimated that 1.35 billion people will be overweight and obese by 2030 (Kelly, Yang, Chen, Reynolds, & He, 2008). The prevalence of obesity in the U.S. between the years of 2011-2014 was ranked over 36% in adults and 17% of the youth (Ogden, Carroll, Kit, & Flegal, 2014). Kelly et al. (2008) indicated that prevention and treatment of obesity and overweight must be a priority in public health.

Obesity in children increases risks for chronic conditions that have traditionally occurred later in life (Estabrooks, Fisher, & Hayman, 2008). Excess weight in younger ages has been connected to earlier death rates in adulthood (American Heart Association [AHA], 2014b). Childhood obesity has been linked to diabetes type II, hyperlipidemia, and hypertension, as well as, psychosocial and physical outcomes (Dixon, Pena, & Taveras, 2012). Dixon et al. (2012) found that in infancy and early childhood, physical activity, diet, and sedentary behaviors are contributors to the development of obesity.

#### **Contributing Factors to Obesity**

Obesity in children is a complex medical concern that is representative of the interplay of environmental and physical factors. More than ever, children are at increased risk for obesity and problems stemming from overweight. Unwholesome food evolutions and environments that promote inactivity have been direct contributors (Brown, Halvorson, Cohen, Lazorick, & Skelton, 2015).

**Physical activity.** The pervasiveness of obesity in children and adolescents has considerably increased since the 1970s. Obesity in these age groups is recognized as a major problem in public health (Estabrooks et al., 2008). For instance, North Carolina's plan to address obesity in their Healthy Weight and Healthy Communities 2013-2020 objectives, clearly states, "It is estimated the bill for overweight and obesity has risen to more than \$140 billion per year.... by 2030, costs could be as high as \$900 billion a year" (Eat Smart, Move More North Carolina, 2013).

According to the County Health Rankings and Roadmaps (2016), physical inactivity is at 32% for this northwestern county, as compared to 20% for the nation. Although the county does have some resources for physical activity, these facilities and parks are located in township areas. This limits the accessibility of the facilities for children and teens who live in the rural areas of the county.

The aforementioned data indicates a great need for intervention in this northwestern county to provide more opportunities for activity to prevent obesity, and its associated diseases. In 2015, Kids Count Data Center (2017) showed a total population of 2,290,568 children under 18 years old in North Carolina. In a 2011-2012 report, it was estimated that 45% of children and teens in North Carolina are not exercising regularly; meaning, in a five-day period children and teens did not engage in vigorous physical activity (Kids Count Data Center, 2017).

Nearly one in three children and teenagers in America are obese or overweight, this rate has almost tripled the rate of 1963 (AHA, 2014b). The Healthy Weight and Healthy Communities' goals address core behaviors that align with HP2020 and the CDC. North Carolina's objectives for 2020 is that at least 9% of public schools in NC

will receive a Healthier School Challenge Award that indicates schools have created a healthier environment promoting physical activity (Eat Smart, Move More North Carolina, 2013). The physical activity objectives state that by January 1, 2020, at least 58% of NC children and youth ages 2-17 will exercise, play a sport, or participate in physical activities that make them sweat or breathe hard for at least 60 minutes, four to five days each week (Eat Smart, Move More North Carolina, 2013). In addition, the National Association of School Nurses (NASN) recognized obesity as a problem for school- aged children in their 2011 position statement (NASN, 2013). School nurses are taking the lead in combating obesity in the schools and promoting physical activity. They are doing this by: (1) development of youth-related wellness policies, (2) promotion of walk-to-school and bike-to-school programs, (3) advocating for facilities to be available for physical activity after school and weekends, and (4) educating children regarding recommended daily amounts of physical activity (NASN, 2013). Further, Copeland et al. (2011) asserts that it is imperative that physical activity be promoted in child-care centers. The specific target group for implementation of this lies with the teachers.

In 2008, the U.S. Department of Health and Human Services (USDHHS) (2018) released the first-ever action plan titled, “Physical Activity Guidelines for Americans” (PAG). The guidelines for children are inclusive of aerobic activity, muscle strengthening, and bone strengthening three days each week for 60 or more minutes a day (USDHHS, 2018). The guidelines highlight the amount, types, and intensity of physical activity needed to achieve health benefits for Americans across the life-span. They asserted that 80% of adolescents are not active enough to meet youth guidelines for aerobic and physical activity (USDHHS, 2018). They also included specific objectives

targeting younger children in child-care settings to incorporate physical activity, including physical education and recess in the public and private elementary schools. The guidelines go on to point out how physical activity in children and adolescents promote bone health, muscular fitness and cardiorespiratory function, and decrease body fat and depression. However, schools inconsistently provide regular physical education (Anderson, 2018). Schools can be an important source of physical activity. Regularly scheduled recesses and structured forms of activities help promote exercise in school-age children; thereby, reducing obesity (Anderson, 2018). In a study of 7,599 ethnically diverse children followed from kindergarten through the fifth grade, Moreno et al. (2015) concluded that children had a consistent pattern of weight gain in the summer months and loss of weight during the school year. It was noted, that the weight gain pattern occurred earlier for children who were overweight (Moreno et al., 2015). In addition, a study investigating potential correlations of preschool children's amount of physical activity while being cared for at a child-care center, found that boys and girls were significantly less physically active while being cared for in a center than when they were outside the care of a center. Boys' physical activity levels in child-care centers were found to be 51.1% vs. 52.4% when outside of a center; girls' physical activity levels while in a child-care center were noted to be 48.0% vs. 51.5% when outside the centers (Hinkley, Salmon, Crawford, Okely, & Hesketh, 2016).

The Center for Disease Control and Prevention (CDC) (2016a) recommended regular physical activity for overall health improvement. They also recommended 60 minutes or more of physical activity each day for children and adolescents. Although the CDC does not recommend a prescriptive dose of physical activity for children 3-5 years

of age, children do benefit from participating in regular physical activities such as leaping, jumping, and gymnastic-like activities. The CDC goes on to include appropriate activities for children 6-17 years of age (CDC, 2018). Three types of physical activity were suggested: aerobic activity, muscular strengthening, and bone strengthening. The recommendations align with the UDHSS guidelines of three days per week of 60 or more minutes of vigorous activity (CDC, 2015). However, for normal-weight children, evidence is not consistently showing an association between physical activity and prevention of obesity. Although the expert consensus is that physical activity for more than 60 minutes a day is beneficial (Davis et al., 2007).

Regardless of the recommendations of HP2020 and the CDC, target goals have not been achieved. Children and adolescent obesity rates continue to be a concern (Anderson, 2018). Statistics for this northwestern county, when compared to North Carolina and the nation clearly shows that physical inactivity is at 32.6% (compared to 24% statewide and 19% for the nation) and access to exercise opportunities is at 57% (compared to 75% statewide and 91% for the nation), (County Health Rankings & Roadmaps, 2017b). This clearly indicates physical inactivity is a concern for the county.

**Sedentary behavior.** The association between sedentary behaviors and unhealthy diets are echoed consistently across age groups. The increasing popularity among the pediatric population of watching television and technology contribute to an inactive lifestyle (Anderson, 2018). In particular, the consumption of energy-dense drinks, snacks, and television viewing contribute to obesity (Pearson & Biddle, 2011). The U.S. Department of Agriculture (USDA) (2010) says Americans spend considerable amounts of their time engaging in sedentary activities. For instance, a major activity for children in

the U.S. is television viewing. On the average, children watch three to four hours a day (USDA, 2010). By the time they graduate, they have spent more time in television viewing than the classroom (American Academy of Child and Adolescent Psychiatry [AACAP], 2011). This makes it very difficult to expend the energy needed to maintain caloric balance. Most school, home, work, and community gatherings do not physically enable active lifestyles. “The increasing popularity among children of using technology and watching television contribute to a sedentary lifestyle,” (Rubenstein, Gross, Hulton, Strang, & Wasserbauer, 2014, p. 349). There is strong evidence that the reduction of recreational screen time, increase of physical activity, and diet improvements among children 13 years old and younger will reduce obesity (The Community Guide, 2014). The CDC (2016b) discussed the importance of limiting video games, television, and internet surfing to a maximum of two hours each day. Ponder and Anderson (2008) state that limiting television, videos, games, and computer time are simple strategies parents can do to help alleviate sedentary behaviors in children. One study pointed out that low-income mothers rarely described limiting screen time as a way to prevent childhood obesity (Danford, Schultz, Rosenblum, Miller, & Lumeng, 2015). Evidence also shows that family support is the best method of intervention. Setting time limits on the use of technology by parents have been found to be very effective in curtailing sedentary behavior associated with technology in children (The Community Guide, 2014). Brown et al. (2015) stated that, “sedentary time and physical activity are both associated with childhood obesity, [although] they may not be inversely proportional. Regardless, efforts to lower the former and increase the latter are key to preventing overweight in children” (p. 1244).

The goal is to decrease sedentary behavior and increase physical activity. Child-care teachers can help meet this goal by ensuring that preschoolers have sufficient space outdoors to engage in activities. The teacher's use of specific outdoor materials to encourage active involvement is crucial to the success of decreasing sedentary time for children (Brown et al., 2009).

**Healthy food choices.** Children are more likely to eat unhealthy snacks when they are sedentary. Healthy food choices are a concern for the pediatric population. "Children and adolescents are encouraged to maintain calorie balance to support normal growth and development without promoting excess weight gain" (U.S. Department of Agriculture, 2010, p. 10). Those who are overweight or obese must change their eating and physical activity behaviors to prevent their BMI-for-age percentile from increasing over time (U.S. Department of Agriculture, 2010). Inactivity and high fat diets are major contributors to overweight. Americans tend to have diets high in fat, calories, and sugar, with substantial servings (Anderson, 2018). Anderson (2018) says school lunches and quick-service restaurant foods are typically oversized and poor in nutrition.

The CDC (2016b) recommends small changes every day for improving dietary consumption for children. This includes only allowing children to eat high-sugar, high-fat, or salty snacks at limited times. They recommend only treats that are 100 calories or less for snacks and balancing caloric intake to help with weight management. High-sugar beverages are a major concern for limiting caloric intake. For instance, fruit juice consumption for many toddlers exceeds daily calorie intake needed, "resulting in liquid calorie overload" (Ponder & Anderson, 2008, pg. 50). Fast food, proteins high in fat, and foods altered in nutritious value, such as snacks should be addressed (Brown et al., 2015)

However, Davis et al. (2007) posited that snack intake might not have an association with obesity in children. This is confounded more by unclear definitions of snacks in literature (Davis et al., (2007).

Healthy eating starts during infancy. The ideal nutrition for infants is breastfeeding. This ensures optimal growth and development the first six months of life. The avoidance of juice until six months of age and limiting to 4-6 ounces each day is recommended (AHA, 2014a). The American Heart Association (AHA, 2014a) advised that parents refrain from overfeeding infants and children. Children's caloric needs vary with each meal. The AHA suggests that parents be consistent with offering nutritious foods; give foods low in trans-fat, salt, added sugars, and cholesterol. In addition, the AHA advised that calories for children should range from 900 each day for a one-year-old to, 1,800 for a 14-18-year-old girl, and 2,200 for a 14-18 year-old boy (AHA, 2014a). Food habits are important to address in the prevention of obesity. Therefore, it is important to refrain from forcing children to finish meals. Brown et al. (2015) suggested families avoid eating foods away from home, eating when not hungry, and snacking, while placing more emphasis on healthy family meals. Child-care teachers must help families use these guidelines to prevent the development of unhealthy eating habits.

When children shift from elementary to middle school, a dramatic change occurs in their food selections. Peer pressure and fad diets become more of a concern. Fast food promotion by media targets this age group with foods like hamburgers, french fries, pizza, and sweet carbonated beverages. The average adolescent diet contains excesses of sugar and fat (Anderson, 2018). Simple changes in children's daily intake may lead to healthier and longer lives.

### **Role of the Childcare Teacher**

Saxe (2011) said timing is opportune for health care professionals to be engaged in fostering the health of the current generation of children, to defy the predictions that children's "life expectancies will be shorter than their parents" (p. 547). In a retrospective cohort study, Wheeler (2013) found that 18-month-old children who were overweight were two times more likely to be obese at four to six years old. Another study confirmed that overweight children as young as three and six years old had a 50% greater risk of being overweight as adults (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Inge et al. (2013) noted in their observational study of 2,458 participants older or equal to 18 years of age having their first time bariatric surgery, that the risk of comorbid illnesses were considerably increased by adolescent obesity. The authors reported each decade beyond 18 years of age incrementally increased the risk of several comorbidities (Inge et al., 2013).

Child-care teachers are a vital means for promoting behaviors in children that will prevent obesity. Copeland et al. (2011) did a maximum variation study that included 49 childcare teachers in nine focus groups. Teachers consistently recognized the many benefits of time outside and physical activity. They recognized that physical activity could be important for preventing childhood obesity. Teachers make the decisions of whether or not to take children outside for physical activity. The study suggested if children were under the care of a restrictive, disengaged teacher, "increasing children's outdoor time will not necessarily increase their physical activity" (Copeland et al., 2011, p. 97-98).

Brown et al. (2009) conducted a cross-sectional study involving direct observation of 476 children attending 32 randomly selected preschools. The researchers found that most of the children's physical activity was sedentary in nature (sit/squat, lie down, stand). Brown et al. (2009) concluded that teachers were rarely intentional in modeling teacher-led activities to increase physical activity. The researchers stated this finding is a direct indication teacher involvement may boost preschooler's activity during the day (Brown et al., 2009). Brown et al. (2009) stated that, "Well-planned preventive physical activity programs with young children and early childhood practitioners in the community- and school-based programs may be productive for early childhood education" (p. 12).

Nursing plays an essential role in the prevention of obesity in children. Ingram and DeCelle (2012) assert a very important part of prevention and management of obesity is providing an environment of support in the community. Nurses can be involved in training child-care teacher's age appropriate games to increase physical activity as the child-care facility may be children's only opportunity to be active on a daily basis (Copeland et al., 2011). Most lifelong habits that pose health risks are developed during childhood and adolescence. "Schools have an important role to play in promoting the health of a nation because this is the only place where children can be easily reached. It is a natural setting to promote healthful [food choices, exercise habits], and [for] building generic self-management skills," (Bandura, 2004, p. 158). In addition, younger children may be more susceptible to changing their food behaviors than older children. The early interventions of child-care teachers can significantly impact the food choices of the pediatric population (Laureati, Bergamaschi, & Pagliarini, 2014). Interventions need to

be aimed at inspiring caregivers to role-model healthy eating behaviors to children, and this role-modeling would reflect a commitment to provide children with healthy food environments (Erinosho, Hales, McWilliams, Emunah, & Stanton, 2012). The role of the child-care teacher is very important and can promote positive health behaviors and attitudes in children that can influence their health and activity patterns in later life (Bandura, 2004).

### **Population/Community**

To understand the importance of reducing obesity in the pediatric population, adult obesity must also be considered. According to County Health Rankings and Roadmaps (2017b), adult obesity for North Carolina ranks 30% among all states. This national database also found that premature deaths (before the age of 75) increased in 2015 across all ethnic and racial groups, and communities; however, they indicated that early deaths from chronic diseases (cancer, heart disease, human immunodeficiency virus (HIV) in the 15-44 age range has decreased over the past decade (County Health Rankings, 2017a). North Carolina Resident Mortality Statistics Summary for 2011-15 indicated that the number of deaths from diseases of the heart was 18,467, while deaths from diabetes mellitus was 2,743 in 2015 (NCDHHS, 2016). Although this data indicates deaths have decreased from certain chronic diseases, it is critical that obesity rates decline. Physical activity, decreased screen time, and healthy food choices are major contributors to reducing obesity and preventing morbidities later in life for the pediatric population.

The northwestern county in North Carolina identified for this project consists of 532 square miles of land with 4.1 square miles of water, inclusive of three major rivers

(Surry County Health & Nutrition Center, 2014). There are 12 townships and four municipalities. The population increased from 59,449 in 1980 to 73,673 in 2010, and then decreased to 73,050 in 2013 (Surry County Health & Nutrition Center, 2014). As of 2016, the population grew to 75,368 and 23.4% of the population is under 18 years old (Northern Hospital of Surry County [NHSC], 2017; United States Census Bureau, 2016). There are 9,458 homes in the county with children 18 years old and younger (Suburban Stats, 2016). In addition, 27% of children are in poverty in the county (County Health Rankings & Roadmaps, 2017b).

According to Eat Smart Move More North Carolina (2015), 16.7% of children aged 2-4 are considered overweight (> 85<sup>th</sup> to < 95<sup>th</sup> percentile), while 14.2% in this age group are considered obese (> = 95<sup>th</sup> percentile) in the county. For children age 5-11, 13% are considered overweight and 9.2% are considered obese (Eat Smart Move More North Carolina, 2015). Children in these age groups are commonly cared for in child-care centers. There are 15 licensed home child-care centers and 33 licensed out of home child-care centers within the county. The number of children cared for in the centers total 2,602 and 276 people are employed in the centers (NCDHHS, 2017). The size of the county, population, and economics contribute to the limited access to resources. The two leading causes of death in 2016 in the northwestern county are considered co-morbidities of obesity: heart disease (123.8 persons per 100,000) and diabetes (20 persons per 100,000) (NHSC, 2017).

The county consists mostly of low-income families and was assigned a Tier 1 designation by the North Carolina Department of Commerce indicating it was “one of the 40 most distressed counties in the state,” (Surry County Health & Nutrition Center, 2014,

p. 18). However, the North Carolina Department of Commerce (2017) most recently designated the county as Tier 2. This indicates there has been improvement in employment rates, household incomes, population growth, and property tax assessments.

The 2015 rates of adult obesity in the county dropped from 31% to 29% in 2016. The rate of physically inactive adults increased to 32% in 2016 from 31% in 2015. Nearly half of the county has access to opportunities for exercise. These are primarily residents who live within city limits (Surry County Health & Nutrition Center, 2016). According to the 2013 Community Health Needs Assessment, obesity was identified as a significant need. In the county, male and female categories were 11.5% above the average and 32.6% of the population; this was determined to be worse than the national average of 26% (NHSC, 2017; County Health Rankings & Roadmaps, 2017b). The local hospital addressed this significant need by offering free fitness and health classes. Hospital officials are concerned that being overweight and obese causes a lot of health conditions. If these issues are addressed early, then problems may be prevented (NHSC, 2017). This project was implemented at a child-care center located in the northwestern region of North Carolina. This was a Christ-centered facility and holds a three-star center license. It is locally owned and operated. Approximately 110 children from 0-12 years-of-age are cared for at the facility. This facility values the health of children and is currently abiding by state guidelines for reimbursements to provide some healthy food choices each day. They also allow for 60 minutes of playtime each day. Table 1 displays breakdowns of the counties statistics. (Eat Smart Move More North Carolina, 2015; NHSC, 2017; NCDHHS, 2017; Surry County Health and Nutrition Center, 2014)

Table 1

*County Statistics*

Descriptive	Statistics
County Population 2016	74,768
Age distribution of population in 2016	0-14: 13,224 (17.7%) 15-17: 3,031 (4.1%) 18-24: 6,427 (8.6%)
Estimated county population by 2021	75,368
Median household income	\$34,515
Children in poverty in county	26% (24% statewide)
Unemployment percentage June 2016	4.9%
Housing – town/rural areas	28%
County poverty levels	17.5% of population
County poverty < 18 years-of-age	27.9%
Overall best health outcomes out of 100 counties in NC	46/100
Overall best health behaviors out of 100 counties in NC	38/100
Morbid/obese of population	32.6%
Physical inactivity % in county	32%
Access to exercise opportunities in county	57% (75% statewide)
Unfavorable county measures- worse than US average (2011)	Female obesity- 40.9% (↑8% since 2001) Male obesity- 37.4%(↑2.5% since 2001) Male physical activity- 47.4% (-2.5% since 2001)
Favorable county measures- better than US average (2011)	Female physical activity- 45.2% (↑10.2% since 2001)
Overweight children age 2-4 (>85 <sup>th</sup> to <95 <sup>th</sup> percentile)	16.7%

Obese children age 2-4 ( $\geq 95^{\text{th}}$ percentile)	14.2%
Overweight children age 5-11 ( $> 85^{\text{th}}$ to $< 95^{\text{th}}$ percentile)	13%
Obese children age 5-11 ( $\geq 95^{\text{th}}$ percentile)	9.2%
Overweight children age 2-18 ( $> 85^{\text{th}}$ to $< 95^{\text{th}}$ percentile)	14%
Obese children age 2-18 ( $\geq 95^{\text{th}}$ percentile)	12%
Number of childcare centers in the county	15 licensed home childcare centers 33 licensed out of home childcare centers
Number of children in home and childcare centers in the county	2,602
Number of childcare employees in the county	276

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### **Sponsor and Stakeholders**

The owner, director, and assistant director were stakeholders of the child-care center and were members of the project team. The child-care teachers and children within the facility of implementation are key stakeholders of this DNP project. The parents and community leaders are additional stakeholders that benefited from the education provided to the childcare teachers and children.

## SWOT Analysis

Table 2

### *SWOT Analysis*

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>○ Teachers and stakeholders involvement in decision making</li> <li>○ Standardized process for early intervention for prevention of childhood obesity</li> <li>○ Collaborative effort with state and nation for reducing childhood obesity rates</li> </ul>	<ul style="list-style-type: none"> <li>○ Preparation time constraints in classroom and play time setting</li> <li>○ Cost of additional resources to support activities</li> <li>○ Teacher behavior modeling</li> <li>○ Teacher potential lack of involvement in activities</li> <li>○ Teacher buy-in</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>○ Decrease future rates of obesity</li> <li>○ Improve number of children being taught prevention strategies</li> <li>○ Teacher education opportunities</li> <li>○ Enhance child care involvement in children's healthy choices</li> <li>○ Impact on healthy behaviors in children</li> <li>○ Reduction of future medical costs</li> </ul>	<ul style="list-style-type: none"> <li>○ Communication with team members</li> <li>○ Time constraints for team members</li> <li>○ Teacher opposition to change</li> <li>○ Stakeholder approval and buy in</li> <li>○ Teacher turnover rates may limit the implementation and continuity of teaching</li> </ul>

### Assess Available Resources

The resources to combat the problem of obesity in children in this northwestern county are available at 27 schools, kindergarten through 12<sup>th</sup> grade. The schools have regular physical education courses, inside gyms, and outside running tracks. The schools offer after-school activities such as softball, track, and various other sports. The county has 15 licensed home child-care centers and 33 licensed child-care centers (NCDHHS, 2017). The county has seven parks, 10 recreation centers and gyms, and one state park.

The seven parks are free resources for children to get physical activity. Each park has playgrounds that are age specific and one park has a water play area. These resources are well kept, and easily accessible by vehicles. The ability to access these resources are limited to walkers and children. They are not safe for children to access without supervision via walking from school or home. They are located in city limits; however, one state park is in a rural area of the county that is not easily accessible for many families. The location of the parks limit access for families.

The county has a local hospital and local health department currently implementing some measures to reduce obesity in the general population. The hospital offers free screenings at local health fairs, scholarships for gym memberships, corporate pricing for gyms memberships, free hospital owned gym memberships for hospital employees and families, school presentations on-site regarding health and wellness, and are sponsors of nearly all health-related community events (NHSC, 2017). The health department collaborates with the community to offer walk-to-school programs. Nutritious food choices are promoted to low-income families through the Women, Infants, and Children (WIC) program. In addition, the Health Department partners with Brenner's Fit Program to provide nutritional education to rural families, and the promotion of breastfeeding services (Surry County Health & Nutrition Center, 2016).

Furthermore, a local wellness facility provides multiple opportunities for exercise. The facility fees are waived for all family members when one of the family members is an employee at the local hospital. Persons in the general community must pay \$36 dollars each month for a single adult membership, \$65 dollars each month for an adult and spouse membership, and \$80 dollars each month for adult and spouse with three children

or more to access the facility. Child-care is available at certain times of the day for members.

A community center is another resource for childhood activity. There are multiple opportunities for children to be a part of groups and sports at the facility. The services available are centered on children Kindergarten age through age 12. During the school year, after school programs are offered to promote exercise in children. Summer camps are provided each year for this age group that focus on fun activities such as games, field trips, and swimming. A Fit-n-Fun Zone is available while parents exercise that engages children ages 5-13 in kick ball and boxing exercises. The availability of resources for ages five and under is a two-hour limit of physically active child-care while parents exercise Monday – Friday each week. Overall, there are sufficient resources in the city that are easy to access and safe; however, the rural part of the county lacks facilities for physical activity. Increasing awareness of the available resources would be helpful.

### **Desired and Expected Outcomes**

The outcome of this project was to improve child-care teachers' knowledge of fun activities that promote exercise and healthy food choices for preschoolers through an educational intervention. The outcomes for the project were determined and evaluated within a six-week timeframe. The expected outcome of the project was an improvement in knowledge for teachers measured by comparing a pre-test and post-test.

### **Team Selection**

The doctoral student led the team with development and implementation of the evidence-based practice project. A doctoral-prepared nurse practitioner served as the chair of this project. The child-care center director, who holds an Associate Degree in

Early Childhood Education, and assistant director, who holds an Associate Degree in Early Childhood Education were essential in serving as practice partners and team members for the project. Other team members included the doctoral student's committee members, who are both are doctoral-prepared Nurse Educators. Each member played a valuable part in the development and implementation of the project.

### **Cost/Benefit Analysis**

A significant cost for the project was the doctoral student's time commitment. The child-care center's director, assistant director, and child-care teachers participated in the study during their normal working hours. The child-care center's owner agreed to provide the time and space for training during normal working hours, as well as the equipment needed for the educational training, thereby negating the costs.

### **Define Scope of Problem**

Nearly 14% of children were obese in 2003 in the United States and by 2017 the national childhood obesity rate was 18.5%. The two to five-year-old group accounted for 13.9 % of the childhood obesity trend (Friis, 2018; Trust for America's Health, 2018). Population growth and aging, along with increases in caloric intake and reduced physical activity are all contributing to the epidemic of obesity (Kelly et al., 2008). Therefore, teaching healthy lifestyles to children helps reduce the risks of diseases such as obesity later in life (Turner, 2014). Nurses play a major role in promoting constructive health practices for young children (Rector, 2018). Healthcare professionals need to help child-care teachers remain aware of the problem of childhood obesity. The intent of the project was for teachers to be better informed and able to implement activities that increased exercise, decreased sedentary time, and incorporated healthy food choices for children.

## **SECTION III**

### **GOALS, OBJECTIVES, AND MISSION STATEMENT**

The goals of a project describe the outcomes of the project. Objectives are the methods used to achieve those goals. Lastly, the mission statement explains the “why” of the project and clarifies the purpose and the methods used to accomplish the project (Zaccagnini & White, 2017).

#### **Goals**

The goal of this project was to provide educational knowledge to child-care teachers regarding fun-filled physical activities, and fun healthy food choice activities. In addition, to encouraging teachers to promote physical activity and healthy food choices during the child-care day. The message child-care teachers give to children must be brief and practical to ensure children can understand (Ponder & Anderson, 2008). Physical activity and healthy food choice instruction in child-care centers should be linked to children’s prior knowledge and interests. In this way, through fun activities child-care teachers can help children make simple and small changes to their daily health habits (First Bites, 2013). In addition, child-care teachers are key instruments to role model and encourage children to partake in physical activity and healthy food choices (Healthy Kids, 2017).

The purpose of this study was to investigate use of an educational intervention designed to teach child-care teachers fun physical activities and fun healthy food choice activities for preschoolers. The intent was for teachers to be better informed and able to implement fun activities that increase exercise, decrease sedentary time, and incorporate healthy food choices for children. Teachers influence physical activity and healthy food

choices by role modeling and educating children during class instruction, in addition to providing take home materials for parent/child learning activities.

### **Objectives**

The outcome of this project was to increase knowledge for child-care teachers to provide fun filled activities for meaningful play and healthy food choices for preschoolers. Teachers demonstrated understanding of obesity prevention education and the need for physical activity and healthy food choices for children. To sustain the intervention, teachers incorporated the fun activities to increase children's physical activity and healthy food choices on a routine basis at the child-care center, using the Animal Trackers model.

Child-care teachers who encounter the pediatric population within the local child-care facility demonstrated an understanding of the importance of fun physical activities and fun healthy food choice activities for preschoolers. This was demonstrated after completing four weeks of one-hour educational sessions that included teaching, demonstrations, visuals, handouts, discussions, and return demonstrations to determine the teacher's knowledge gained of the benefits of the education to the children.

### **Mission Statement**

The mission of this project was to empower teachers to lead a societal shift in children toward active lifestyles and healthy eating choices preventing obesity. Classroom practice changes in the designated child-care center were inclusive of fun physical activities during structured playtime on a daily basis, and fun healthy food choice activities on a weekly basis. The educational measures were intended to help decrease obesity rates in the community.

## SECTION IV

### THEORETICAL FRAMEWORK

#### Theoretical Underpinnings/Support Project Framework

Masters (2015) suggested the use of a theoretical framework provides a logical and educated approach to nursing practice. Nola Pender's Health Promotion Model (HPM) is beneficial in nursing practice when the emphasis of care is on fostering behaviors that promote health (Masters, 2015). The nurse's role is to increase awareness, support self-efficacy, and regulate the environment to foster change in behavior with the goal of promoting higher-level health in families and communities (Masters, 2015).

Pender's Health Promotion Model includes four concepts that were relevant to this project. The first concept was perceived benefits of action. Teachers influence physical activity and healthy food choices for children. These changes were dependent on the teacher's perceived benefits of the project. If the teacher's felt the project made a difference then they were more willing to participate. The perceived benefits may be intrinsic or extrinsic. Intrinsic benefits of alertness, energy, and interactive engagement may be more sustainable in health behavior changes because involvement in the process of change is more involved. Extrinsic benefits are typically inclusive of significant social and monetary rewards (Pender, Murdaugh, & Parsons, 2011). The intrinsic benefits are greater motivation for child-care teachers than extrinsic because of the level of engagement in actions of change. Although social rewards are motivators, the monetary rewards are unlikely to be available for the teacher.

The second concept was perceived barriers to action. Barriers may be mental blocks and perceived as hurdles inhibiting the teacher's progression. Furthermore, time

for extra preparation may impede the teacher's ability to promote exercise and model healthy food habits for children. The benefit of role-modeling positive behavior for children may not be apparent to the teacher. The commitment and additional workload to plan and prepare fun activities is time consuming (Pender et al., 2011). Efforts to overcome perceived barriers to action included clearly communicating goals, ensuring skill sets were competent to assist with changes, confirming child-care teachers felt a sense of control, and making sure teacher motivation was high. These actions safeguarded readiness and ensured barriers were limited or eliminated (Pender et al. 2011). The focus of the project was to assist the teachers to overcome perceived barriers to action and be a catalyst of change for healthy behaviors in children.

The third concept was perceived self-efficacy. This is the belief that an individual has the ability to perform particular guidelines or actions (Pender et al., 2011). This capability is not dependent on skills, but rather the belief one has in themselves that they can carry out what they plan with the skills they have (Pender et al., 2011). Being efficient and skilled encouraged teachers to engage in the target behavior regularly. Self-efficacy motivated health-promoting behaviors in teachers because they felt capable of succeeding in the actions planned. Pender et al. (2011) reported, "The most powerful input to self-efficacy is successful performance of a behavior" (p. 54). During this project, self-efficacy was promoted by ensuring child-care teachers engaged in project activities when they felt competent with the interventions. Teachers observed the desired behaviors, discussed the benefits of engaging in the behaviors, and practiced the fun activities and teaching materials to gain the self-efficacy and utilize the model in their teaching practices in the child-care center.

The fourth concept was health-promoting behavior. Integrating health-promoting behaviors with healthy lifestyles will result in improved health, “better functional ability and a better quality of life at all stages of development” (Pender et al., 2011, p. 50). The focus of the project was to assist the teachers to use preventive interventions shaping the future of children. Exercise and nutrition are included in health-promoting behaviors. Positive behavioral teaching and focusing on the benefits of change, while assisting teachers to overcome hurdles to behavior performance, were important building blocks. Successful performances and positive feedback enhanced self-efficacy of teachers and promoted change in their daily routine to include promotion of healthy behaviors in children (Pender et al., 2011).

Nola Pender’s HPM was an appropriate framework to utilize when educating child-care teachers and to raise awareness of preventive measures for children. A randomized study concluded that the HPM is useful in developing physical activity interventions (Anderson & Pullen, 2013). In addition, the HPM is valuable for an educational intervention to forecast nutritional behavior (Pender et al., 2011). This tool offered a framework to motivate engagement in behaviors promoting health and well-being for this project (Pender et al., 2011).

## **SECTION V**

### **WORK PLANNING**

#### **Project Proposal**

The doctoral student implemented an evidence-based project to increase physical activity and healthy eating behaviors of children in a child-care facility. An educational class was implemented to train child-care teachers to incorporate fun activities increasing physical activity and promote healthy eating choices for children. Prior to the start of the educational sessions teachers completed an informed consent and pre-test. Two weeks after completion of the educational sessions, effectiveness of knowledge gained by teachers was measured by administering a post-test. Teachers also completed a program evaluation after completion of the DNP project.

#### **Methodology**

The doctoral student developed a pre-test and post-test to assess child-care teacher's knowledge of fun physical activity and healthy food choices for preschool aged children. The Child Care Teacher's Knowledge Evaluation (CCTKE) instrument that was developed by the doctoral student was utilized in this project. The CCTKE measured the teacher's knowledge of fun physical activities and healthy food choices for pre-school children. Teachers answered 21 questions rating themselves on a 5-point Likert ranging from five to one: five for strongly agree, four for somewhat agree, three for neutral, two for somewhat disagree, or one for strongly disagree. After completion of the project, teachers completed the CCTKE post-test, in addition, to a program evaluation consisting of five open-ended questions. Once all surveys were completed, the data was aggregated,

coded, and entered into Microsoft Excel. A t-test was used to determine differences between pre-test and post-test means.

The Animal Trackers (AT) model was used to educate childcare teachers on fun activities that increased physical activity and incorporated education on healthy eating into each weekly session. The teaching sessions were held in the child-care center for four consecutive weeks. Two weeks following the educational sessions a follow up visit, post-evaluation, and program evaluation was administered by the doctoral student.

(Figure 1, Table 3)

### Project Management Tools

Childcare Instructor Educational Sessions	June-August 2017	Sept 2017	Oct 2017	Nov - Dec 2017	Jan 2017	Feb 2017	Mar 2017	April 2017	May 2017	June 2017
Planning										
Research										
Design										
IRB Applications										
Initial Implementation										
Implementation of project										
Evaluation										

Figure 1. Gantt Chart

Table 3

*Project Timeline*

Task	Start Date	Semester	Status
Problem Identification	April - May 2017	Spring	Completed
Capstone Project Chair (Dr. Isaac-Dockery)	May 2017	Spring	Completed
Procure Advisory Committee Members	June, 2017	Summer	Completed
Project Proposal Approval	September, 2017	Summer	Completed
Procured Practice Site for Project	September, 2017	Summer	Completed
Procure Project Practice Partner at Site	September, 2017	Summer	Completed
Literature Review for Identified Problem	June - October, 2017	Summer/Fall	Completed
Identification of Stakeholders and Sponsors	June - September, 2017	Summer	Completed
Organizational Assessment/ SWOT Analysis	July - September, 2017	Summer	Completed
Assess Available Resources	July - September, 2017	Summer	Completed
Establish Outcomes	September, 2017	Summer	Completed
Team Member Selection	September - November, 2017	Summer/Fall	Completed
Cost/Benefit Analysis	September, 2017	Summer	Completed
Scope of Problem Defined	June - September, 2017	Summer	Completed
Goals, Objectives & Mission Statement	September - October, 2017	Summer/Fall	Completed
Mission Statement	October, 2017	Fall	Completed
Theoretical Underpinnings	October, 2017	Fall	Completed
Project Management Tools (Project Timeline, Budget)/Work Planning	October, 2017	Fall	Completed
Evaluation Plan, Logic Model Development, Quality Improvement Development	November, 2017	Fall	Completed
CITI completion	November, 2017	Fall	Completed

IRB Submission/Approval	November 2017 - February 2018	Fall/Spring	Completed
Project Implementation	February, 2018	Spring	Completed
Interpretation of Data	March - May, 2018	Spring	Completed
Dissemination and Reporting	April - June, 2018	Summer	Completed

### **Budget**

The program administrator and child-care center owner provided the financial management for the project. The time commitment of the administrator was absorbed throughout the project development, implementation, and dissertation phases. The doctoral student purchased the Animal Trackers model for \$107.95.

The child-care center owner provided in kind the time, space, and any equipment needed for the educational training, thereby negating the costs. The posters and handouts were included in the Animal Trackers program. The program administrator and child-care center owner shared the cost of making copies of the take home activities for parent-child interaction. The program administrator provided copies for the teachers and the child-care owner provided copies for the children. No costs was incurred for the teachers.

## **SECTION VI**

### **EVALUTION PLANNING**

The evidence-based project consisted of a pre-test and post-test. During week one and prior to implementation, 15 teachers were asked to complete an informed consent, and the pre-test 21-item Child Care Teachers' Knowledge Evaluation (CCTKE) form (Appendix A). The pre-test was coded A. The doctoral student provided these items in the form of hard copy handouts. The doctoral student left the room when it was time for the teachers to complete the informed consent form and pre-test. Fifteen minutes was allotted for completion of the CCTKE. The doctoral student asked a teacher to volunteer to collect the envelopes containing the pre-test and informed consents, and then hand deliver them to the doctoral student following completion. The informed consent stated the teacher's completion of the test was voluntary and there was no obligation to complete the test. The consent informed participants if they agreed to participate in the study they would complete the informed consent and pre-test. However, if they decided not to participate in the study they would not complete the forms and there was no penalty for not participating in the project.

Four one-hour educational sessions were provided to the teachers during structured playtime with children over a four-week period. The fun activities were discussed with teachers prior to each educational session. Return demonstration from teachers were incorporated into the initial demonstration of each fun physical activity and healthy food choice activity. Posters for each physical activity were hung within the educational space to provide visualization for teachers and children. Fun healthy food choice activities were included during the last 20 minutes of each session. Healthy food

choice and physical activity work sheets were provided for teachers to utilize in the classroom and for children to take home to complete with parents or guardians.

Two weeks after the final educational session, teachers completed a 21-item CCTKE-coded B post-test (Appendix A) and the program evaluation survey (Appendix B). The post-test and program evaluation survey was distributed over a three day span by the child-care center director and assistant director. Fifteen minutes was allotted for completion of the post-test and evaluation survey. An envelope was provided for teachers to place their completed post-tests and program surveys into. Once all surveys were received a *t*-test was used to determine the results.

### **Logic Model**

Zaccagnini and White (2017) says logic models are pictorial representations of how the project administrator expects a program to function. Hayes, Parchman, and Howard (2011) define it as a “framework for describing the relationships between resources, activities and results as they relate to a specific program or project goal” (p. 576). The logic model explains how the parts of the project are connected to each other. The model depicts the evolvement of the project from the input to the output. The logic model starts with planned project inputs and program activities. This includes resources needed to “implement and evaluate” the project (Zaccagnini & White, 2017, p. 479). Examples of resources may be personnel, financial, or managerial. Program activities describe what the project will do to utilize the attainable resources needed to meet desired outcomes. Activities can be trainings, training space, and technical equipment required to implement the project. Outputs are the immediate and intended results of the project activities. The logic model outcomes are divided into three levels. These levels are short-

term, long-term, and impact outcomes. Short-term outcomes are the measurements of the effects of the project activities. Knowledge and the skills gained are measured “for the population served by the project” (Zaccagnini & White, 2017, p. 480). Long-term outcomes are reflective of the changes in behaviors or motivation in the population served. Impact outcomes, the last step in the logic model, depict the results of the transformation of the persons served by the project (Zaccagnini & White, 2017). The factors for this project for each of these categories is included in the following representation (Table 4).

Table 4

*Logic Model*

Inputs	Activities	Outputs	Short-term	Long-term	Impact
Child-care teachers	Community assessment	Trained teachers	Number of teachers using new knowledge	Increased teacher knowledge	Improve health promoting behaviors in the child-care center
Child-care center	Meetings	Instructional hours	Competent teachers	Increased number of teachers promoting healthy behaviors	
Budget	Process development	Number of meetings			
Physical classroom for training	Educational training	Participation rates		Improved health outcomes in the county	
Computer equipment/Supplies	Technology	Data			
Model training books/posters/activity sheets	Pre-test and post-test CCTKE				
Hard copy surveys	Program evaluation survey				
Nola Pender’s Health Promotion Model					

## Quality Improvement Methods

The Plan-Do-Check-Act (PDCA) was the quality improvement method used for this project. The PDCA, also known as the Demming Cycle, is a logical sequence of continuous quality improvement steps (Zaccagnini & White, 2017). This method is a four-step process that is valuable to project process improvement needs. The first step of the process is Plan. This entails identification and analysis of the opportunity for improvement, development of the hypothesis about possible gaps, and a decision on how to test the need (Zaccagnini & White, 2017). The opportunity for improvement for this project was increasing teacher's knowledge of fun physical activities and fun healthy food choice activities in preschool classrooms. The second step is Do. This consists of testing the potential solution and measuring the results (Zaccagnini & White, 2017). The potential solution for this project was providing four one-hour educational sessions to teachers during the children's structured playtime. The educational sessions incorporated fun physical activities and fun healthy food choice activities. The third step of the PDCA is Study. Studying the project's results determined the effectiveness of the intervention (Zaccagnini & White, 2017). Analysis of the overall mean from pre-test and post-test CCTKE indicated there was no significant difference in knowledge after the educational sessions. However, the means and standard deviations for categories of physical activities, parental teaching, teacher role model, and teacher research showed a slight difference in knowledge after the four-week educational intervention. Furthermore, conducting a teacher's program evaluation analysis revealed an overall satisfaction with the program. The last step of the PDCA is Act. During this step of the project, it was determined whether or not additional action needed to take place and if modification of

the project was necessary (Zaccagnini & White, 2017). When the educational sessions proved effective, based on the means and standard deviations for physical activities, parental teaching, teacher role model, teacher research categories, and program evaluations, a classroom practice change at the child-care center sustained the project. The project will be expanded to include daily structured playtime activities in the preschool classes.

## **SECTION VII**

### **IMPLEMENTATION**

Institutional Review Board (IRB) approval for the project was acquired through the University's School of Nursing and Graduate Studies. IRB approval was not required from the local child-care center. Child-care teachers employed by the local child-care center completed four weeks of one-hour educational sessions and demonstrated competency of the fun physical activities and healthy food choice activities for preschoolers. February and March 2018, the doctoral student taught the classes to the child-care teachers during preschoolers' structured playtime. The doctoral student offered one morning and one evening educational session during the first week of implementation. As the project progressed, sessions increased to three times each week at various times for the remaining three weeks of implementation to accommodate child-care teacher's schedules. Two child-care teachers were present during each educational session in each classroom and floater teachers would occasionally come into the classroom and participate in the sessions taught by the doctoral student.

The initial educational session was held the third week of February 2018. The educational session was taught by the doctoral student to child-care teachers during structured playtime in two separate pre-school classrooms. Poster visuals of characters for the fun physical activities were displayed on the wall and left there for child-care teachers to use during the week. During the first 40 minutes of the session, fun physical activities with Lenny the Lizard using a creep here and a creep there, walking and marching with Dara the Duck, and running with Chuck the Cheetah were taught by the doctoral student. Lenny the Lizard consisted of crawling while lying on the stomach, with

shoulders and head raised, and elbows supporting body weight. Movements of locomotion were used while reciting “The Lenny Crawl” poem, “Lenny’s Adventure” story, and a song where motions were synchronized with the familiar rhythm, “Old McDonald”. During Dara the Duck fun physical activities, the weight of the body was transferred from the ball of one foot to the toes, and then to the heel of the other foot, while constant contact was made with the floor. The doctoral student taught child-care teachers and children to walk around the room reciting and moving to “Dara Walks” poem. Followed by “When Dara Comes Marching Home”, while clapping and marching in a zig zag motion to the tune of “When Johnny Comes Marching Home”. Lastly, Chuck the Cheetah fun physical activities included imagery to the poem “Like the Wind” to practice running skills. Preschoolers were then challenged to show how they would run if they were in certain situations with an “On the Run” activity that used imaginary settings such as hot burning sand, playing basketball, and running in big heavy boots (Williams, Pica, Carter, & Lucca, 2017). The remaining 20 minutes of the session, fun healthy food choice coloring activity sheets were provided for child-care teachers to distribute to preschoolers. The doctoral student provided education to the child-care teachers for the activity sheets and guided the preschoolers to complete the fun healthy food choice activities, such as “On the Go Food Track”. During the session, Go Foods (spinach, sweet potatoes, corn, and lettuce) and Slow Foods (candy, chips, high sugar drinks) were taught to child-care teachers and preschoolers to educate the difference in healthy food choices and unhealthy food choices. Activity sheets were provided for teachers to send home with preschoolers, for example, the Healthy Hops Family Activity: “Three Easy Steps to

Being Physically Active as A Family” and “Know Your Go Foods” for child-parent interaction and learning (Williams, Carter, Bozza-George, & Lucca, 2005).

The first 40 minutes of the second week of educational sessions included jumping and hoping with Kate the Kangaroo, galloping with Harry the Horse, and throwing and catching with Maria the Monkey during structured playtime. The doctoral student taught how to use Kate the Kangaroo and children’s natural love of jumping to encourage physical activity. Emphasis was placed on how kangaroos get around by jumping, while children jumped to the poem, “What Kangaroos Do”. A “Rabbits and ‘Roos” story was taught by the doctoral student while children alternated between the jumping styles of kangaroos and rabbits. In addition, an activity “Hopping, Hopping All Around” to the rhythm of “Twinkle, Twinkle, Little Star” was taught. Harry the Horse activities included uneven rhythm movement combinations of walking and running where one-foot leads and the other foot catches up. A “Look at Him Gallop” poem was recited while children galloped to the instructions. Children learned to move like Harry: galloping fast, slow, and zigzagging to the directions in “A Horse Story”. Children were then instructed to gallop at a slow pace and fast pace to the song “Harry Gallops” to the tune of “Camptown Races”. In addition, Maria the Monkey fun physical activities utilized overhand and underhand throwing actions while throwing a ball to the poem “Maria Throws”. A bounce and catch activity was used while the child-care teachers were taught the chant “Bounce and catch, Bounce and catch. Catch it so I don’t have to fetch!” Moreover, the “Maria Had to Catch a Ball” activity was sung to the tune of “Mary Had a Little Lamb” while throwing and catching the ball (Williams et al., 2017).

Child-care teachers successfully demonstrated the activities and preschoolers successfully participated. The educational sessions were taught by the doctoral student to child-care teachers during structured playtime in three separate pre-school classrooms. Poster visuals of characters for the fun physical activities were added to the characters displayed on the wall for the previous week and left there for child-care teachers to use during the week. The remaining 20 minutes of the session, fun healthy food choice coloring activity sheets were provided for child-care teachers to distribute to preschoolers. The doctoral student provided training to the child-care teachers for the activity sheets and guided the preschoolers to complete the fun healthy food choice activities. The activity sheets, “I Spy Healthy Food to Take to a Picnic”, “Help Junk Food Jed Find His Way to Healthy Snacks”, and “Find the Hidden Healthy GO Foods in the Picture”, was utilized in the classroom while discussing healthy food choices, such as carrots, peas, collard greens, green beans and brussel sprouts. For child-parent interaction and learning, activity sheets were provided for teachers to send home with preschoolers. For instance, “Healthy Hops Family Activity: Know Your GO Foods” and “Draw a Line from Sammy Spud and Tommy Tater to the Right Spot” activity (Williams et al., 2005).

Week three educational sessions included kicking with Marty the Mule, rolling with Danny the Dog, and balancing with Buddy the Bear. The educational session was taught by the doctoral student to child-care teachers during the first 40 minutes of structured playtime in three separate pre-school classrooms. The doctoral student taught a kicking activity to the accompaniment of “Getting a Kick Out of Marty” poem. The children were instructed to kick -- one kick at a time followed by two kicks at a time.

Balancing during kicking was encouraged by holding onto a desk, chair, or the wall. After Marty the Mule activity, Danny the Dog log rolls (or dog rolls) was taught by placing arms overhead to roll forwards and backwards as far as possible to the poem “Do as Danny Does”. Then a balancing activity with Buddy the Bear to “Buddy Says...” was taught. Buddy gave instructions such as, “Put your weight on your... feet, hands and knees, knees and elbows, knees only, your tummy, or your bottom only”. Finally, a “Buddy Balances Again” activity was taught. The activity required static balances on different parts of the body at high and low levels for five seconds each (Williams et al., 2017).

Poster visuals of characters for the fun physical activities were added to the characters displayed on the wall for the previous two weeks and left there for child-care teachers to use during the week. Child-care teachers successfully demonstrated the activities and preschoolers successfully participated after education was provided by the doctoral student. The remaining 20 minutes of the session, fun healthy food choice coloring activity sheets were provided for child-care teachers to distribute to preschoolers. The doctoral student provided training to the child-care teachers for the activity sheets and guided the preschoolers to complete the fun healthy food choice activities. The activity sheets, “Who Will Win the Race? Go or Slow?” was provided in the classroom with education of healthy food choices, such as tomatoes, pumpkin, broccoli and turnips. For child-parent interaction and learning, activity sheets were provided for teachers to send home with preschoolers. For instance, “Sometimes it is Fun to Relax. Choose Your Favorite Thing to do During a Quiet Time” and “Circle Your

Favorite Things to do and Train to Health” refrigerator magnet activity (Williams et al., 2005).

Week four educational session included Animals on Parade. A combination of the previous three weeks of fun physical activities and characters were utilized during the first 40 minutes of the structured playtime in three separate pre-school classrooms. “Animals on Parade” poem was recited slowly to allow the full experience of each skill before moving to the next. The poem was repeated three times using Lenny the Lizard creeping, Dara the Duck waddling in a straight line, Chuck the Cheetah running in place, Kate the Kangaroo jumping, Harry the Horse galloping in stride, Buddy the Bear walking on tip toes and hands, and concluded with deep breathing exercises at the end of the animal parade (Williams et al., 2017). Using the posters for visuals from the previous three weeks of characters and fun physical activities, the doctoral student observed child-care teachers leading and teaching preschoolers. Fun physical activities and the benefits of healthy food choices were reinforced. The remaining 20 minutes of the session, fun healthy food choice coloring activity sheets were provided for child-care teachers to distribute to preschoolers. The doctoral student provided training to the child-care teachers for the activity sheets and guided the preschoolers to complete the fun healthy food choice activities. The activity sheet, “Connect the Dots to Find Three Healthy Snacks,” was utilized while the doctoral student observed the child-care teacher’s interaction with preschoolers. Lastly, a food tasting activity with a tray of broccoli, cauliflower, tomatoes, cucumbers, and sliced green peppers was passed around to preschoolers for sampling while GO Foods were discussed (Williams et al., 2005).

During the month of February and March 11 educational sessions were offered to the child-care teachers. Throughout week one, two educational sessions were offered. However, during week two through four, one additional educational session was added to meet the needs of child-care teacher's schedules. A total of six child-care teachers completed the 11 educational sessions while six floater child-care teachers completed portions of the educational sessions taught by the doctoral student. In addition, one child-care teacher resigned, and two child-care teachers were committed to duties that prevented them from attending the educational sessions.

Post-test and program evaluations were administered during week six of the project. Post-test and program evaluation packets were delivered to the child-care center director. The director dispersed them to the child-care teachers during a three-day period. The doctoral student retrieved the packets at the end of day three. Data interpretation and analysis was completed over the subsequent four weeks.

### **Threats and Barriers**

The project was based on a convenience sample study with real and probable limitations. The study was limited to one child-care center in a small rural setting resulting in a small sample size. Fifteen teachers ( $n=15$ ) completed the pre-test, while only six ( $n=6$ ) consistently came to the sessions and six ( $n=6$ ) floated in and out of the sessions. Furthermore, one child-care teacher resigned, and two child-care teachers were committed to duties that prevented them from attending the educational sessions.

At the completion of the project only six ( $n=6$ ) teachers completed the post-test and subsequent program evaluation. The project was during normal working hours for teachers and during structured playtime with children. Teacher concentration was limited

due to parents dropping off and picking up children, and by a constant need to re-focus and discipline children in the classroom. Furthermore, teachers were short staffed due to flu season and teacher resignations. This resulted in project delays along with teacher and student absences. In addition, space in the child-care center classrooms posed a limitation. A gymnasium would have enhanced the activities and provided needed space for teachers and children to participate. Moreover, one teacher did not find the educational food activities beneficial.

## SECTION VIII

### INTERPRETATION OF DATA

Qualitative data for this project was collected using a pre-test and post-test CCKTE. The CCKTE was developed by the doctoral student. The reliability for the CCKTE was found to be 0.90 at the completion of the study. In addition, quantitative data was collected using a post program evaluation survey to analyze child-care teacher's appraisal of the educational program.

#### Qualitative Data

The purpose of the study, Child Care Teachers' Knowledge of Fun Physical Activities and Healthy Food Choices for Pre-School Children, was to provide educational sessions to train child-care teachers to incorporate fun activities that increase physical activity and promote healthy eating choices for children. Fifteen ( $n=15$ ) CCTKE pre-tests were distributed to the child-care teachers. Fifteen ( $n=15$ ) CCTKE pre-tests were returned to the DNP student. Fifteen ( $n=15$ ) CCTKE post-tests along with 15 program evaluations were distributed to the teachers. Six ( $n=6$ ) (40%) CCTKE post-tests and program evaluations were returned to the DNP student.

The CCTKE outcomes were based on overall and categorical results. The categories included physical activities, healthy food, parental teaching, teacher role model, teacher research, and teacher knowledge (see Appendix C). Teachers were asked to complete the CCTKE and rate on a Likert scale whether they strongly agree or disagree, neutral, or somewhat agree or disagree (Appendix A). Based on the findings of the overall CCTKE scores, the results were not statistically significant and there was not a significant difference in the pre-test scores ( $M = 78.2$ ,  $SD = 12.91$ ) and post-test scores

( $M = 80.5$ ,  $SD = 9.39$ );  $t(13) = -0.452$ ,  $p > 0.05$  after the four-week educational intervention. Further, the following six categories were analyzed:

1. **Physical Activities.** There was not a significant difference in the pre-test scores ( $M = 14.2$ ,  $SD = 2.08$ ) and post-test scores ( $M = 15.1$ ,  $SD = 2.48$ );  $t(8) = -0.783$ ,  $p > 0.05$  after the four-week educational intervention.
2. **Healthy Food.** There was not a significant difference in the pre-test scores ( $M = 6.2$ ,  $SD = 1.93$ ) and post-test scores ( $M = 6$ ,  $SD = 2.44$ );  $t(7) = 0.162$ ,  $p > 0.05$  after the four-week educational intervention.
3. **Parental Teaching.** There was not a significant difference in the pre-test scores ( $M = 6.8$ ,  $SD = 2.62$ ) and post-test scores ( $M = 7.16$ ,  $SD = 2.67$ );  $t(15) = -0.344$ ,  $p > 0.05$  after the four-week educational intervention.
4. **Teacher Role Model.** There was not a significant difference in the pre-test scores ( $M = 32.06$ ,  $SD = 4.3$ ) and post-test scores ( $M = 33$ ,  $SD = 2.19$ );  $t(17) = -0.654$ ,  $p > 0.05$  after the four-week educational intervention.
5. **Teacher Research.** There was not a significant difference in the pre-test scores ( $M = 14.6$ ,  $SD = 3.94$ ) and post-test scores ( $M = 15$ ,  $SD = 3.52$ );  $t(10) = -0.227$ ,  $p > 0.05$  after the four-week educational intervention.
6. **Childhood Obesity.** There was not a significant difference in the pre-test scores ( $M = 4.2$ ,  $SD = 1.01$ ) and post-test scores ( $M = 4.1$ ,  $SD = 0.75$ );  $t(13) = 0.082$ ,  $p > 0.05$  after the four-week educational intervention.

### **Quantitative Data**

Six (40%) teachers completed the post program evaluation survey (Appendix B).

Teachers were asked how often they utilized the activities learned within the week. Three

(50%) of the teachers estimated they utilized the activities learned in the educational sessions one to two times each week. Two (33%) teachers estimated they utilized the activities learned in the educational sessions three to four days each week. One (17%) teacher indicated the activities learned in the educational sessions were used weekly.

Teachers were asked in what ways were the children receptive to the new structured play. Four (66%) teachers reported “They love the new structured play, they wanted to continue doing the activities, they enjoyed following along with the movements, and the kids enjoyed being able to make motions like animals.” Lastly, “They enjoyed the various stories and motions.” One (17%) teacher reported, “Some joined and stayed. Most would start and lose focus”. One (17%) teacher reported “N/A” for children’s reception to new structured play.

Teachers were asked how the children seemed to engage in the physical activities and food tastings. Five (83%) teachers reported children’s engagement in physical activities and food tastings as “They did movements with happy eagerness and they enjoyed the one food tasting we did, the children love to sing the food songs, the children talk about vegetables how they make you go, and the children would engage in the movements and drawing on the floor and they liked the food art sheet.” Lastly it was reported, “The children really enjoyed the physical activities with the balls.” One (17%) teacher did not respond to how children seem to engage in the physical activities and food tastings.

Teachers were asked what they liked most about the program. Six (100%) teachers reported what they liked most was “Fun songs/movements”. They also enjoyed the children had a fun and different learning activity, and they enjoyed having different

activities.” In addition it was reported they liked the “new movement ideas and loved that animals were included.”

Teachers were asked what they liked least about the program. Two (33%) teachers reported what they liked least about the program was “sometimes the activities were a little too long for the age” and “some of the activities were too long for the kids attention span”. Two (33%) teachers did not respond to what they liked least about the program. One (17%) teacher reported what they liked least about the program was it “seemed a little too mature for certain age groups”. In addition, one (17%) teacher reported what they liked least about the program was “The talking about foods”.

### **Process Improvement Data**

Based on the results of this project, suggestions for improvement include using a larger sample of teachers and workshops in future studies. Providing an educational project that caters to the teachers in a workshop format would be beneficial. Training teachers in an all day workshop would enable teachers to learn the information, ask questions, and practice in a stress-free setting. This would afford the teachers the opportunity to practice activities and plan for preschool children involvement prior to engaging the children.

### **Discussion of Findings**

This project demonstrated that after four educational sessions teacher’s overall knowledge of fun physical activities and fun healthy food choice activities was not significantly different. However, the overall means and standard deviations indicated a lean toward a difference in knowledge after the educational sessions. The category of physical activities, parental teaching, teacher role model, and teacher research showed a slight difference in knowledge after the educational sessions. The first five years in a child’s life

are critical for development of healthy behaviors. Child-care teachers can be valuable in promoting healthy lifestyle choices for preschoolers. Teachers spend consistent time with children and this provides the opportunity to impact the healthy habits of children in the early formative years of life.

A limited number of studies are available to discuss the nurse's role in educating child-care teachers on physical activity and healthy food choices. Additional studies could be beneficial to determine if there is a correlation between health education and teacher's promotion of healthy choices in the classroom. Consistent with the HPM, teachers who encourage healthy behaviors for children play an important role in positive health outcomes for communities.

### **Conclusion**

The findings from the CCTKE and program evaluation demonstrate child-care teachers' need for fun physical activities and fun healthy food choice activities for preschoolers. Despite this need, nurses are not conducting routine education for child-care teachers in the community. Implications for nursing includes increased awareness and participation in educating child-care teachers on the need for physical activity and healthy food choices in child-care centers. The significance of nurses to be involved in educating child-care teachers in recognizing the importance of physical activity and healthy food choices for children enables teachers to promote healthier lifestyles in communities.

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## Appendix A

## Child Care Teacher's Knowledge (CCTKE)

**Child Care Teacher's Knowledge (CCTKE) of Fun Physical Activities (running, kicking, throwing) and Healthy Food Choices Evaluation Tool**

Please rate the following.

**1. I routinely incorporate fun physical activity during structured playtime.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**2. I incorporate fun activities for healthy food choices at least weekly for children, for example familiar kid songs that include healthy foods as the focus.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**3. I demonstrate new ways that promote fun physical activity during structured playtime.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**4. I include parents in the promotion of healthy activities by sending teaching materials and worksheets home with children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**5. I role model healthy eating choices to children in my care.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**6. I feel that exercising in my personal life helps me incorporate physical activities for children in my care.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**7. I role model healthy food choices by eating with children during snack times and lunch.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**8. I role model healthy eating choices during snack time and lunch with children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**9. I spend time researching fun new ways to incorporate healthy food choice education for children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**10. I spend time researching fun new physical activities to promote exercise for children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**11. I strive to gain continued education to learn new ways to promote exercise and healthy food choices for children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**12. I believe that I play a significant role in shaping healthy habits for the children I care for.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**13. I play an important role in shaping healthy habits in children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**14. I discourage sedentary time (sitting, standing) during playtime.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**15. I role model fun physical activities during playtime at least three times each week.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**16. I provide parental education that promotes fun physical activities.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**17. I believe teachers should be role models by setting an example of a healthy weight.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**18. I feel it is important to provide education to parents concerning prevention of obesity strategies (physical activity and healthy food choices) for children.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**19. Including fun physical activities during structured playtime is inconvenient.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**20. Including fun activities that promote healthy food choices is inconvenient.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

**21. Childhood obesity is a growing concern.**

5= strongly agree      4= somewhat agree      3= Neutral      2= somewhat disagree      1= strongly disagree

Appendix B  
Program Evaluation Survey

**Teacher Evaluation Regarding the Program- post implementation only**

**Please answer the following.**

1. How often did you utilize the activities learned in the educational sessions within the week?
2. In what ways were the children receptive to the new structured play?
3. Describe how the children seem to engage in the physical activities and food tastings?
4. What did you like most about the program?
5. What did you like least about the program?

Appendix C  
Categorical Results

<b>CCTKE Tool Categories</b>	<b>Question Number</b>
Physical Activities	1, 3, 14, 19
Healthy Food	2, 20
Parental Teaching	4, 16
Teacher Role Model	5, 6, 7, 8, 12, 13, 15, 17
Teacher Research	9, 10, 11, 18
Teacher Knowledge	21